NASA CR-66702
1 November 1968

FOR U.S. GOVERNMENT AGENCIES AND THEIR CONTRACTORS ONLY

N 68-38445

A STUDY OF ALTERNATE MEANS OF IMPLEMENTING A HORIZON DEFINITION EXPERIMENT

Contract NAS 1-8187

FINAL REPORT

Volume Two – Support Data

Distribution of this report is provided in the interest of information exchange. Responsibility for the contents resides in the author or organization that prepared it.

Submitted to

National Aeronautics and Space Administration
Langley Research Center
Applied Materials and Physics Division
Langley Station, Hampton, Virginia 23365

by

LOCKHEED MISSILES & SPACE COMPANY
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION
SPACE SYSTEMS DIVISION SUNNYVALE, CALIFORNIA

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VOLUME TWO – SUPPORT DATA

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APPENDIX A

DETAILED COST DATA

APPENDIX A-DETAILED COST DATA

The purpose of this appendix is to present the detailed costing data from which the summary cost estimates for the reference concept and the five alternates were derived. Data are presented in six tables, (A-1 through A-6), under two major headings: Table (a)-Nonrecurring Costs (development and other one-time expenditures); and Table (b)-Recurring (operational program) Costs. The recurring cost data are presented in this appendix in terms of cost per unit or cost per mission use. Thus, to obtain the total recurring cost, it is necessary to multiply the unit costs by the numbers of units required.

To clarify the cost-breakdown structure of elements cited in the cost data tables, the following key definitions are provided:

Program Management - This comprises all direct-charge program management functions normally centralized in a project office. It includes program documentation and reporting, schedule and cost controls, and configuration management. It does not include the cost of supporting indirect management and/or management functions that are not normally charged directly to the contract; these latter costs are covered in the overhead rate assigned to the direct labor base.

Systems Engineering and Integration - This element includes the costs associated with analysis and documentation of the total systems aspects of the spacecraft, as well as defining, verifying, and documenting all internal and external spacecraft interfaces. It includes such total spacecraft/system analyses as flight environment definition, thermodynamic analysis, and electromagnetic interference predictions. It also includes the definition of physical interfaces, e.g., spacecraft/launch vehicle, spacecraft/experiment, power/TT&C systems, etc.

Support Engineering - This element encompasses all of the direct-charge engineering functions performed on operational systems. It includes change engineering and other program-peculiar functions, failure reporting and diagnosis, and field services.

All costs specified in this appendix are for CY 1968 cost levels and are in thousands of dollars.

Table A-1(a)

NON-RECURRING COSTS, CONCEPT R
(In Thousands of Dollars)

Concept R-Total Nonrecurring	12,415			
Program Management		480		
Experiment		2,946		
Component Development			2,544	
Radiometer				1,014
Refrigerator				220
Star Sensor				300
Sun Sensor				210
Core Memory				800
Subsystems Engineering and Integration			300	
Test			102	
Spacecraft		8,589		
Design and Analysis			960	
Systems Development			1,989	
Structures and Temperature Control				192
Attitude Control System				714
Electric Power System				498
Tracking, Telemetry and Command				585
Systems Integration			240	
Reliability			640	
Tooling			360	
GSE			950	
Testing			3,450	
Test Hardware				2,997
Test Operations				453
Launch Vehicle		400		

Table A-1 (b)

RECURRING COSTS, CONCEPT R

Concept R – Total One-Time Cost	9,048			
Program Management		240		
Experiment		1,347		
Radiometer Assembly			487	
Radiometer and Mounting				407
Cryogenic Refrigerator				80
Attitude Determination Subsystem			140	
Star Sensors (2)				80
Sun Sensors (2)				60
Data Handling Subsystem			650	
Core Memory				600
Analog-to-Digital Converter				25
Frequency Standard				15
Data Formatter				10
Assembly and Calibration			36	
Acceptance Test			34	
Spacecraft		1,470		
Structures and Temperature Control			70	
Attitude Control System			200	
Horizon Sensor				60
Magnetic Torquer Coils (3)				15
Nutation Dampers (2)				25
Logic Control Unit				100
Electric Power System			345	
Solar Cells				125
Batteries (2)				20
Charge Regulators (2)				60
DC/DC Converters (2)				90
Power Control Unit				10
Voltage Regulators (4)				20
Connecting Cabling, Buses and Switches				20

Table A-1 (b) (Cont.)

Tracking, Telemetry and Command System		410	
S-Band Transponders (2)			120
S-Band Antennas (6)			3
VHF Transmitters (2)			10
VHF Antennas (4)			4
PCM Telemetry Module			8
Command Receiver			25
Command Clocks (2)			200
Connecting Wiring, Couplings, etc.			40
Assembly		180	
Acceptance Test		68	
Support Engineering		192	
Transportation		5	
Launch Vehicle	2,816		
Thor LV-2G (DSV-2L)		1,200	
Interstage Adapter		23	
Delta Stage		878	
Payload Adapter (Attach Fitting)		35	
Nose Fairing		80	
Factory Checkout		160	
Transportation		10	
Software		430	
Launch Services and Operations	635		
Launch Vehicle		550	
Checkout			520
Propellants			30
Spacecraft		85	
Mission Operations	1,410		
Range Operations		60	
Spacecraft Tracking and Data Acquisition		1,350	
Data Reduction	1,130		

Table A-2 (a)

NONRECURRING COSTS, CONCEPT III-1

Concept III-1 – Total Nonrecurring	5,827			
Program Management		128		
Experiment		5,219		
Component Development*			2,544	
Subsystems Engineering and Integration			300	
Reliability			320	
GSE			450	
Testing			1,605	
Test Hardware				1,503
Test Operations				102
Experiment Integration		480		

*Same Cost Breakdown as in Concept R

Table A-2 (b)

RECURRING COSTS, CONCEPT III-1

Concept III-1 Total One-Time Cost	4,036			
Program Management		64		
Experiment		1,458		
Radiometer Assembly*			487	
Attitude Determination Subsystem			140	
Star Field Comparator (2)				80
Sun Sensors (2)				60
Data Handling Subsystem*			650	
Experiment-Nodding Drive Mechanism			15	
Assembly and Calibration			36	
Acceptance Test			34	
Support Engineering			96	
Launch Services and Operations		34		
Mission Operations		1,350		
Data Reduction		1,130		

*Same Cost Breakdown as in Concept R

Table A-3(a)

NON-RECURRING COSTS, CONCEPT III-2

Concept III-2 – Total Non-Recurring	9,495			
Program Management		240		
Experiment		2,946		
Component Development*			2,544	
Subsystems Engineering and Integration			300	
Test			102	
Burner II Modifications		6,109		
Design and Analysis			320	
Systems Development/Modification			1,647	
Structures and Temperature Control				96
Attitude Control System				564
Electric Power System				498
Tracking, Telemetry and Command				489
Systems Integration			240	
Reliability			384	
GSE Additions and Modifications			525	
Testing			2,993	
Test Hardware				2,653
Test Operations				340
Launch Vehicle		200		

*Same cost breakdown as in Concept R

Table A-3(b)

RECURRING COSTS, CONCEPT III-2

Concept III-2 – Total One-Time Cost	7,575			
Program Management		120		
Experiment		1,347		
Radiometer Assembly*			487	
Attitude Determination Subsystem*			140	
Data Handling Subsystem*			650	
Assembly and Calibration			36	
Acceptance Test			34	
Burner II Mission Peculiars		1,252		
Attitude Control System			228	
Horizon Sensor				60
Control Moment Gyro				90
Δ Cost for Uprated GRU Gyros				30
Nitrogen Storage Spheres (4)				8
Nitrogen System Plumbing				40
Electric Power System			403	
Solar Cells – 67 sq ft				168
Batteries (4)				40
Charge Regulators (4)				120
DC/DC Converter				45
Voltage Regulators (2)				10
Power Distribution Cabling and Equipment				20
Tracking, Telemetry and Command			455	
S-Band Transponders (2)				120
S-Band Antennas (2)				1
PCM Telemetry Module				8
VHF Transmitters (2)				10

*Same cost breakdown as in Concept R

Table A-3(b) (Cont.)

Burner II Mission Peculiars (Cont.)			
Tracking, Telemetry and Command (Cont.)			
VHF Antenna			1
Command Receiver			25
Command Clocks (2)			200
Programmer			50
Connecting Wiring, Couplings, Switches, etc.			40
Δ Cost – Assembly		36	
Δ Cost – Acceptance Test		34	
Δ Cost – Support Engineering		96	
Launch Vehicle	1,876		
Thor LV-2G		1,200	
Basic Burner II Stage		566	
Payload Adapter		**	
Nose Fairing		**	
Factory Checkout		100	
Burner II			**
Thorad			100
Transportation		10	
Software		***	
Launch Services and Operations	500		
Thor		300	
Burner II		200	
Mission Operations	1,350		
Range Operations		***	
Tracking and Data Acquisition		1,350	
Data Reduction	1,130		

**Costs included in Basic Burner II cost, above
***Costs included under Launch Services and Operations

Table A-4(a)

NON-RECURRING COSTS, CONCEPT S-1

Concept S-1 – Total Non-Recurring	7,028			
Program Management		288		
Experiment		2,599		
Component Development			2,197	
Radiometer				867
Refrigerator				220
Star Field Comparator				300
Sun Sensor				210
Core Memory				600
Subsystems Engineering and Integration			300	
Test			102	
Spacecraft (Modified P-11)		4,141		
Design and Analysis			192	
Systems Development			803	
Structures and Temperature Control				32
Attitude Control System				378
Electric Power System				32
Tracking, Telemetry and Command				361
Systems Integration			64	
Reliability			448	
GSE			450	
Testing			2,184	
Test Hardware				1,912
Test Operations				272

Table A-4(b)

RECURRING COSTS, CONCEPT S-1

Concept S-1 – Total One-Time Cost	4,257			
Program Management		144		
Experiment		1,090		
Radiometer Assembly			430	
Radiometer and Mounting				350
Cryogenic Refrigerator				80
Attitude Determination Subsystem			140	
Star Field Sensors (2)				80
Sun Sensors (2)				60
Data Handling Subsystem			450	
Core Memory				400
Analog-to-Digital Converter				25
Frequency Standard				15
Data Formatter				10
Assembly and Calibration			36	
Acceptance Test			34	
Spacecraft		768		
Structure and Temperature Control			75	
Attitude Control System			146	
Basic P-11 Attitude Control System (ACS)				10
Horizon Sensor				15
Magnetic Torquer Coils				15
Logic Control Unit				100
Added N_2 Sphere and Plumbing				5
Despin Mechanism				1

Table A-4(b) (Cont.)

Electric Power System (P-11)		85	
Tracking, Telemetry and Command System		212	
S-Band Transponder			60
S-Band Antennas (4)			2
VHF Transmitter			5
VHF Antenna (2)			2
PCM Telemetry Module			8
Command Receiver			25
Timer			100
Connecting Wiring, Coupling, Switches			10
Propulsion System (P-11)		15	
Separation and Deployment System (P-11)		70	
Assembly		**	
Acceptance Test		60	
Support Engineering		105	
Launch Services and Operations	25		
Mission Operations	1,350		
Data Reduction	880		

**Included in Structures cost, above.

Table A-5(a)

NONRECURRING COSTS, CONCEPT S-2

Concept S-2 – Total Nonrecurring	12,008			
Program Management		272		
Experiment		2,599		
Component Development			2,197	
Radiometer				867
Refrigerator				220
Star Sensor				300
Sun Sensor				210
Core Memory				600
Subsystems Engineering and Integration			300	
Test			102	
Spacecraft		9,037		
Design and Analysis			864	
Systems Development			3,269	
Structures and Temperature Control				48
Attitude Control System				1,139
Electric Power System				798
Tracking, Telemetry and Command				1,284
Systems Integration			240	
Reliability			576	
Tooling			324	
GSE			725	
Testing			3,039	
Test Hardware				2,529
Test Operations				510
Launch Vehicle		100		

Table A-5(b)

RECURRING COSTS, CONCEPT S-2

Concept S-2 – Total One-Time Cost	6,328			
Program Management		136		
Experiment		1,090		
Radiometer Assembly			430	
Radiometer and Mounting				350
Cryogenic Refrigerator				80
Attitude Determination Subsystem			140	
Star Sensors (2)				80
Sun Sensors (2)				60
Data Handling Subsystem			450	
Core Memory				400
Analog-to-Digital Converter				25
Frequency Standard				15
Data Formatter				10
Assembly and Calibration			36	
Acceptance Test			34	
Spacecraft		1,304		
Structures and Temperature Control			37	
Attitude Control System			305	
Horizon Sensor				15
Momentum Wheel				150
Pitch Rate Gyro				15
Nutation Damper				25
Logic Control Unit				100

Table A-5(b) (Cont.)

Electric Power System		305	
Solar Cells			85
Batteries (2)			20
Charge Regulators (2)			60
DC/DC Converters (2)			90
Power Control Unit			10
Voltage Regulators (4)			20
Connecting Cabling, Buses and Switches			20
Tracking, Telemetry and Command System		389	
S-Band Transponders (2)			120
S-Band Antennas (4)			2
VHF Transmitters (2)			10
VHF Antennas (4)			4
PCM Telemetry Module			8
Command Receiver			25
Command Clocks (2)			200
Connecting Wiring, Couplings, etc.			20
Assembly		54	
Acceptance Test		68	
Support Engineering		144	
Transportation		2	
Launch Vehicle	1,500		
Improved Scout (4-stage)		1,500	
Nose Fairing		**	
Factory Checkout		**	
Transportation		**	
Software		**	

**Included in Launch Vehicle basic cost, above.

Table A-5(b) (Cont.)

Launch Services and Operations	68	
Launch Vehicle		**
Spacecraft		68
Mission Operations	1,350	
Range Operations		**
Spacecraft Tracking and Data Acquisition		1,350
Data Reduction	880	

**Included in Launch Vehicle basic cost, above.

Table A-6(a)

NONRECURRING COSTS, CONCEPT S-3

Concept S-3 – Total Nonrecurring	13,357			
Program Management		480		
Experiment		2,946		
Component Development			2,544	
Radiometer				1,014
Refrigerator				220
Star Sensor				300
Sun Sensor				210
Core Memory				800
Subsystems Engineering and Integration			300	
Test			102	
Spacecraft		9,331		
Design and Analysis			960	
Systems Development			2,464	
Structures and Temperature Control				192
Attitude Control System				1,039
Electric Power System				648
Tracking, Telemetry and Command				585
Systems Integration			240	
Reliability			640	
Tooling			360	
GSE			850	
Testing			3,817	
Test Hardware				3,250
Test Operations				567
Launch Vehicle		600		

Table A-6(b)

RECURRING COSTS, CONCEPT S-3

Concept S-3			
Program Management	240		
Experiment	1,347 (per item; 2 required per launch)		
Radiometer Assembly		487	
Radiometer and Mounting			407
Cryogenic Refrigerator			80
Attitude Determination Subsystem		140	
Star Sensors (2)			80
Sun Sensors (2)			60
Data Handling Subsystem		650	
Core Memory			600
Analog-to-Digital Converter			25
Frequency Standard			15
Data Formatter			10
Assembly and Calibration		36	
Acceptance Test		34	
Spacecraft	1,723 (per item; 2 required per launch)		
Structures and Temperature Control		54	
Attitude Control System		355	
Horizon Sensor			15
Momentum Wheel			200
Pitch Rate Gyro			15
Nutation Damper			25
Logic Control Unit			100
Electric Power System		460	
Solar Cells			240
Batteries (2)			20
Charge Regulators (2)			60

Table A-6(b) (Cont.)

Spacecraft (Cont.)			
Electric Power System (Cont.)			
DC/DC Converters (2)			90
Power Control Unit			10
Voltage Regulators (4)			20
Connecting Cabling, Buses and Switches			20
Tracking, Telemetry and Command System		409	
S-Band Transponders (2)			120
S-Band Antennas (4)			2
VHF Transmitters (2)			10
VHF Antennas (4)			4
PCM Telemetry Module			8
Command Receiver			25
Command Clocks (2)			200
Connecting Wiring, Couplings, etc.			40
Assembly		180	
Acceptance Test		68	
Support Engineering		192	
Transportation		5	
Launch Vehicle	3,244		
Thor LV-2G		1.244	
Basic Thor			1,200
BTL Guidance Package			44
NASA A-4 Vehicle		1,585	
Basic Agena			1,235
Secondary Propulsion System			350
Interstage Adapter		35	
Payload Adapter		70	
Spin Table		70	

Table A-6(b) (Cont.)

Launch Vehicle (Cont.)		
Nose Fairing		100
Factory Checkout		130
Transportation		10
Software		***
Launch Services and Operations	621	
Launch Vehicle		536
Spacecraft		85
Mission Operations	2,760	
Range Operations		60
Spacecraft Tracking and Data Acquisition		2,700
Data Reduction	2,260	

***Included under Launch Services and Operations

APPENDIX B

STAR AVAILABILITY FOR STAR FIELD MAPPING

APPENDIX B – STAR AVAILABILITY FOR STAR FIELD MAPPING

LMSC has been investigating the suitability of star sensors for precise spacecraft attitude reference for an application other than the Horizon Definition Experiment mission. A computer program is being developed which relates star availability and magnitude and sensor look angles to orbit ephemeris. Approximately 33,000 stars, as listed in the BOSS catalog, have been converted to magnetic tape format. The LMSC Horizon Definition Experiment Alternate Means Study was provided with the results of this work in the form of a listing of the 225 stars brighter than 6.5 visual magnitude and a listing of the results of a specific computer solution for one typical orbit. Each sensor made 252 star intercepts and the vast majority of these were in the 5 to 6.5 visual magnitude band. Although this is not the suggested orbit or configuration of star sensors recommended for the Horizon Definition Experiment mission, the parameters are typical of a flight similar to Concept S-1 (P-11), and the star data show a representative coverage for a polar orbit down to the 6.5 visual magnitude (V.M.).

For these calculations the spacecraft was assumed to have been launched at 2230 GMT on 24 April 1968 into an 84.7 degree inclined orbit. The data computed was for the initial orbit and starts with the first north-bound crossing of the equator. Two five-degree field-of-view starmappers were assumed, each tilted 45 degrees from the zenith and pointing 45 degrees to the left and right of the flight path.

The data presented on Pages B-2 through B-5 are:

Column No.	Data	Column No.	Data
1	Program Star Identification	5	Declination
2	BOSS Catalog Identification Number	6	Delta R.A. } Program Cross-checks
		7	Delta Declination } Program Cross-checks
3	Visual Magnitude	8	Orbit Angle } Program Cross-checks
4	Right Ascension		

On Pages B-6 through B-15, data on star sightings for each five degrees of orbit angle advance starting with the northbound crossing of the equator are shown. The latitude of the spacecraft at the sighting time is shown in the caption data. The subsequent data under each orbital position is shown with the identification of the viewing sensor. For each sighting, the same data is shown as in the first three columns as is shown above in Columns 2 through 5. The balance of the data are program cross checks.

(RT ASC,DECL) OF ORBIT-NORMAL (153.0, 10.0)

INSTR NO. 1 TILT= 45.0 PHASE (FROM ZENITH)= 45.0 FIELD-ANGLE= 5.0

INSTR NO. 2 TILT= 45.0 PHASE (FROM ZENITH)= 45.0 FIELD-ANGLE= 5.0

1	9355	6.02	105.97	9.24	-47.03	-0.76	181.04
2	9394	5.95	106.35	4.96	-46.65	-5.04	186.91
3	9409	5.92	106.52	7.52	-46.48	-2.48	183.41
4	9421	5.58	106.63	15.98	-46.37	5.98	171.76
5	9462	6.46	107.05	21.30	-45.95	11.30	164.46
6	9477	5.02	107.16	-3.81	-45.84	-13.81	198.92
7	9505	5.40	107.44	0.19	-45.56	-9.81	193.62
8	9516	6.04	107.54	5.71	-45.46	-4.29	186.01
9	9518	4.09	107.56	0.38	-45.44	-9.62	193.38
10	9521	5.76	107.62	24.18	-45.38	14.18	160.45
11	9524	6.22	107.60	5.53	-45.40	-4.47	186.27
12	9551	5.31	107.88	16.21	-45.12	6.21	171.26
13	9585	6.02	108.19	24.94	-44.81	14.94	159.26
14	9589	6.12	108.15	-2.15	-44.85	-12.15	196.98
15	9590	5.56	108.16	3.17	-44.84	-6.83	189.64
16	9592	5.84	108.19	12.17	-44.81	2.17	176.92
17	9627	5.87	108.49	27.95	-44.51	17.95	155.19
18	9628	5.97	108.48	8.03	-44.52	-1.97	182.80
19	9679	6.44	108.89	6.74	-44.11	-3.26	184.68
20	9698	6.36	108.99	-5.38	-44.01	-15.38	201.60
21	9701	3.65	109.06	16.60	-43.94	6.60	170.53
22	9739	6.06	109.43	2.80	-43.57	-7.20	190.38
23	9752	5.95	109.52	7.20	-43.48	-2.80	184.06
24	9755	3.51	109.55	22.04	-43.45	12.04	162.76
25	9759	6.47	109.57	15.20	-43.43	5.20	172.45
26	9804	6.50	109.94	-7.18	-43.06	-17.18	204.37
27	9808	5.16	110.02	20.51	-42.98	10.51	164.78
28	9821	6.00	110.10	0.24	-42.90	-9.76	194.18
29	9823	6.17	110.12	-7.08	-42.88	-17.08	204.31
30	9827	6.30	110.18	-1.08	-42.82	-11.08	196.08
31	9833	5.83	110.21	-4.08	-42.79	-14.08	200.27
32	9843	5.08	110.38	25.11	-42.62	15.11	158.25
33	9844	6.02	110.39	23.01	-42.61	13.01	161.16
34	9868	5.71	110.64	27.70	-42.36	17.70	154.65
35	9876	6.37	110.66	15.58	-42.34	5.58	171.75
36	9897	3.89	110.94	27.86	-42.06	17.86	154.31
37	9905	5.82	110.92	-12.31	-42.08	-22.31	211.48
38	9923	6.08	111.07	-4.29	-41.93	-14.29	200.87
39	9930	6.47	111.12	-3.53	-41.88	-13.53	199.82
40	9934	6.45	111.24	21.60	-41.76	11.60	162.87
41	9937	5.88	111.26	20.32	-41.74	10.32	164.70
42	9957	5.27	111.46	21.51	-41.54	11.51	162.93
43	9979	5.86	111.59	-10.51	-41.41	-20.51	209.49
44	9987	4.18	111.76	31.85	-41.24	21.85	148.69
45	9997	5.04	111.84	28.19	-41.16	18.19	153.48
46	10015	5.09	111.96	27.98	-41.04	17.98	153.69
47	10022	6.00	111.96	-9.74	-41.04	-19.74	208.66
48	10023	5.99	111.97	-6.51	-41.03	-16.51	204.31
49	10027	5.94	111.98	-13.07	-41.02	-23.07	212.98
50	10053	6.38	112.32	-4.84	-40.68	-14.84	202.12
51	10054	5.60	112.32	-8.29	-40.68	-18.29	206.89
52	10090	6.02	112.64	-7.19	-40.36	-17.19	205.53
53	10113	6.24	112.97	-13.73	-40.03	-23.73	214.36
54	10120	1.58	113.14	31.96	-39.86	21.96	147.83
55	10122	5.06	113.08	-13.55	-39.92	-23.55	214.18

56	10137	5.34	113.28	31.03	-39.72	21.03	148.97
57	10189	5.57	113.65	-13.58	-39.35	-23.58	214.54
58	10192	6.43	113.68	-7.76	-39.32	-17.76	206.82
59	10208	5.66	113.82	-18.37	-39.18	-28.37	220.52
60	10237	5.61	114.11	35.12	-38.89	25.12	143.24
61	10242	6.42	114.04	-13.63	-38.96	-23.63	214.84
62	10257	4.92	114.27	34.66	-38.73	24.66	143.73
63	10280	6.14	114.46	32.08	-38.54	22.08	146.92
64	10288	5.89	114.52	38.42	-38.48	28.42	138.99
65	10290	6.44	114.42	-17.40	-38.58	-27.40	219.73
66	10322	6.08	114.70	-18.41	-38.30	-28.41	221.12
67	10328	5.15	114.73	-14.81	-38.27	-24.81	216.74
68	10354	6.00	115.16	34.08	-37.84	24.08	143.93
69	10455	6.06	116.00	-13.39	-37.00	-23.39	215.70
70	10460	5.45	116.13	37.60	-36.87	27.60	138.94
71	10469	5.11	116.12	-13.52	-36.88	-23.52	215.94
72	10482	5.29	116.36	33.50	-36.64	23.50	143.93
73	10501	5.84	116.46	-21.56	-36.54	-31.56	225.89
74	10556	5.32	116.92	-23.17	-36.08	-33.17	227.98
75	10562	3.47	116.99	-23.22	-36.01	-33.22	228.08
76	10569	5.54	117.06	-16.85	-35.94	-26.85	220.78
77	10572	6.48	117.09	-19.88	-35.91	-29.88	224.40
78	10582	6.40	117.17	-18.56	-35.83	-28.56	222.92
79	10613	6.42	117.41	-23.55	-35.59	-33.55	228.74
80	10632	5.78	117.58	-20.91	-35.42	-30.91	225.93
81	10756	4.35	118.87	-21.21	-34.13	-31.21	227.19
82	10757	6.47	119.01	44.06	-33.99	34.06	129.59
83	10805	5.22	119.43	-22.78	-33.57	-32.78	229.35
84	10995	6.24	121.24	43.92	-31.76	33.92	128.05
85	11034	2.88	121.55	-22.36	-31.45	-32.36	230.53
86	11049	6.44	121.80	43.11	-31.20	33.11	128.47
87	11322	6.43	124.17	-28.71	-28.83	-38.71	238.97
88	11401	4.43	125.16	43.93	-27.84	33.93	124.77
89	11443	5.86	125.37	-24.39	-27.63	-34.39	235.88
90	11534	6.33	126.35	46.43	-26.65	36.43	121.29
91	11569	6.28	126.50	-29.09	-26.50	-39.09	241.22
92	11624	6.50	127.03	-25.44	-25.97	-35.44	238.39
93	11651	5.63	127.30	-30.61	-25.70	-40.61	243.17
94	11723	6.36	127.90	-29.24	-25.10	-39.24	242.55
95	11765	6.38	128.31	-30.20	-24.69	-40.20	243.70
96	11786	5.88	128.53	-25.95	-24.47	-35.95	240.27
97	11839	6.50	129.06	-31.06	-23.94	-41.06	245.02
98	11903	5.52	129.70	46.64	-23.30	36.64	118.00
99	11907	5.04	129.59	-27.26	-23.41	-37.26	242.43
100	11965	6.21	130.20	47.73	-22.80	37.73	116.61
101	12018	3.70	130.58	-31.64	-22.42	-41.64	246.78
102	12126	6.38	131.39	-32.22	-21.61	-42.22	247.91
103	12195	5.23	132.14	-30.08	-20.86	-40.08	247.06
104	12262	6.50	132.78	-30.36	-20.22	-40.36	247.87
105	12407	3.12	134.26	48.95	-18.74	38.95	111.68
106	12604	4.54	136.66	52.53	-16.34	42.53	107.05
107	12761	4.89	138.47	54.97	-14.53	44.97	104.09
108	12773	6.04	138.42	-35.35	-14.58	-45.35	256.04
109	12787	4.70	138.62	-35.55	-14.38	-45.55	256.30
110	12865	6.12	139.63	52.23	-13.37	42.23	104.29
111	12873	6.48	139.62	-32.87	-13.38	-42.87	256.00
112	12893	6.10	139.80	-35.40	-13.20	-45.40	257.31
113	12962	6.37	140.68	52.56	-12.32	42.56	103.08
114	12971	6.48	140.61	-35.23	-12.39	-45.23	257.99
115	13055	6.48	141.58	-34.00	-11.42	-44.00	258.41
116	13091	4.64	141.98	-33.06	-11.02	-43.06	258.44
117	13154	5.96	142.55	-33.31	-10.45	-43.31	259.11
118	13157	3.26	142.68	52.73	-10.32	42.73	100.97
119	13212	4.65	143.16	53.08	-9.84	43.08	100.36
120	13248	6.48	143.47	-33.20	-9.53	-43.20	260.00
121	13306	6.09	144.03	-34.94	-8.97	-44.94	261.12

122	13386	6.34	145.23	55.41	-7.77	45.41	97.59
123	13404	6.41	145.33	-33.55	-7.67	-43.55	262.01
124	13539	6.05	147.03	-35.89	-5.97	-45.89	264.24
125	13543	6.30	147.12	-34.81	-5.88	-44.81	264.12
126	13559	4.54	147.49	55.14	-5.51	45.14	95.46
127	13741	5.25	149.37	-33.21	-3.63	-43.21	266.15
128	13827	5.74	150.62	55.01	-2.38	45.01	92.37
129	13842	6.15	150.77	53.49	-2.23	43.49	92.35
130	13853	6.44	150.76	-37.14	-2.24	-47.14	267.92
131	13870	6.28	150.97	-34.73	-2.03	-44.73	267.95
132	13928	6.36	151.66	-35.79	-1.34	-45.79	268.70
133	13961	6.28	152.04	-33.27	-0.96	-43.27	268.98
134	14081	6.25	153.49	-34.63	0.49	-44.63	270.49
135	14155	6.40	154.31	-34.35	1.31	-44.35	271.33
136	14172	6.44	154.55	54.93	1.55	44.93	88.45
137	14181	6.22	154.61	55.37	1.61	45.37	88.41
138	14281	5.40	155.52	-35.16	2.52	-45.16	272.50
139	14427	4.84	157.15	57.16	4.15	47.16	86.16
140	14498	6.44	157.93	54.68	4.93	44.68	85.03
141	14625	5.72	159.28	54.87	6.28	44.87	83.73
142	14962	5.36	162.91	55.81	9.91	45.81	80.50
143	15047	4.70	163.81	-34.10	10.81	-44.10	280.95
144	15082	6.34	164.35	53.11	11.35	43.11	78.12
145	15094	5.76	164.43	-31.50	11.43	-41.50	282.62
146	15238	5.53	165.85	-33.44	12.85	-43.44	283.22
147	15350	5.76	167.09	-30.88	14.09	-40.88	285.70
148	15358	6.46	167.68	-30.82	14.68	-40.82	286.35
149	15485	6.34	168.56	54.02	15.56	44.02	74.49
150	15506	5.97	168.73	50.73	15.73	40.73	72.53
151	15523	6.24	168.92	-35.24	15.92	-45.24	285.21
152	15530	6.45	169.03	-32.52	16.03	-42.52	286.76
153	15641	5.12	170.41	-33.10	17.41	-43.10	287.74
154	15680	5.34	170.98	-33.20	17.98	-43.20	288.20
155	15735	6.49	171.60	-33.94	18.60	-43.94	288.32
156	15789	6.38	172.29	49.20	19.29	39.20	67.95
157	15797	6.42	172.36	50.06	19.36	40.06	68.49
158	15845	3.72	172.86	-29.42	19.86	-39.42	292.45
159	15873	6.14	173.23	-30.39	20.23	-40.39	292.12
160	15917	5.87	173.75	-31.71	20.75	-41.71	291.68
161	15930	6.44	173.86	-30.29	20.86	-40.29	292.78
162	15947	5.99	174.04	51.89	21.04	41.89	68.19
163	15970	6.25	174.21	48.11	21.21	38.11	65.24
164	16019	4.88	174.65	-32.53	21.65	-42.53	291.91
165	16055	5.31	175.03	-30.78	22.03	-40.78	293.51
166	16137	3.85	176.09	49.06	23.09	39.06	64.20
167	16236	5.96	177.52	-28.46	24.52	-38.46	297.58
168	16258	4.40	177.82	-31.37	24.82	-41.37	295.48
169	16296	6.46	178.36	47.76	25.36	37.76	61.06
170	16312	6.12	178.51	-26.80	25.51	-36.80	299.92
171	16445	5.07	180.12	44.32	27.12	34.32	56.27
172	16739	6.42	183.53	-21.93	30.53	-31.93	309.19
173	16750	5.80	183.63	41.94	30.63	31.94	50.74
174	16887	5.81	185.42	-22.44	32.42	-32.44	310.15
175	16899	5.98	185.55	43.82	32.55	33.82	51.23
176	16936	6.34	185.91	-25.53	32.91	-35.53	307.27
177	16948	5.22	186.07	40.29	33.07	30.29	46.96
178	17039	5.87	187.15	-21.58	34.15	-31.58	312.41
179	17108	6.15	187.92	-17.48	34.92	-27.48	317.75
180	17127	4.32	188.06	42.61	35.06	32.61	48.08
181	17133	2.84	188.18	-21.88	35.18	-31.88	312.81
182	17165	6.12	188.57	-18.74	35.57	-28.74	316.69
183	17216	6.08	189.27	-15.01	36.27	-25.01	321.74
184	17221	6.29	189.31	42.14	36.31	32.14	46.70
185	17231	6.32	189.43	37.22	36.43	27.22	40.89
186	17273	6.01	190.04	-17.50	37.04	-27.50	319.16
187	17337	5.97	190.87	40.53	37.87	30.53	43.85

188	17410	5.83	191.93	28.80	38.93	18.80	28.45
189	17430	5.86	192.16	38.77	39.16	28.77	41.00
190	17455	5.07	192.54	28.79	39.54	18.79	28.13
191	17515	5.96	193.16	-9.60	40.16	-19.60	331.10
192	17516	4.91	193.17	-7.71	40.17	-17.71	333.66
193	17517	6.26	193.17	34.78	40.17	24.78	35.59
194	17548	6.10	193.55	-13.92	40.55	-23.92	325.70
195	17631	5.87	194.50	-1.43	41.50	-11.43	343.03
196	17647	5.08	194.69	32.03	41.69	22.03	31.31
197	17649	6.12	194.74	-1.87	41.74	-11.87	342.48
198	17654	6.12	194.77	19.61	41.77	9.61	14.26
199	17667	6.01	194.89	18.36	41.89	8.36	12.42
200	17764	6.44	196.16	30.26	43.16	20.26	28.35
201	17767	6.04	196.20	22.39	43.20	12.39	17.79
202	17769	5.90	196.20	23.85	43.20	13.85	19.81
203	17787	4.90	196.41	28.86	43.41	18.86	26.43
204	17794	5.26	196.55	-8.49	43.55	-18.49	334.11
205	17796	6.40	196.59	28.79	43.59	18.79	26.26
206	17805	5.70	196.72	-6.25	43.72	-16.25	337.14
207	17815	6.44	196.89	-7.69	43.89	-17.69	335.30
208	17817	5.95	196.90	11.25	43.90	1.25	1.80
209	17822	6.20	197.02	-8.90	44.02	-18.90	333.77
210	17825	6.18	197.06	18.07	44.06	8.07	11.53
211	17828	4.44	197.07	-3.69	44.07	-13.69	340.70
212	17833	4.46	197.11	18.75	44.11	8.75	12.46
213	17877	6.46	197.65	25.48	44.65	15.48	21.51
214	17884	5.82	197.74	12.78	44.74	2.78	3.94
215	17904	6.48	197.91	19.95	44.91	9.95	13.95
216	17933	5.81	198.23	12.55	45.23	2.55	3.59
217	17960	6.49	198.69	0.17	45.69	-9.83	346.40
218	17970	6.29	198.75	21.00	45.75	11.00	15.18
219	17975	5.22	198.80	10.63	45.80	0.63	0.87
220	17988	5.45	198.92	14.89	45.92	4.89	6.79
221	17993	6.32	198.96	1.36	45.96	-8.64	348.07
222	17995	5.01	199.00	6.68	46.00	-3.32	355.39
223	18050	6.23	199.77	4.15	46.77	-5.85	352.00
224	18079	5.68	200.02	3.30	47.02	-6.70	350.87
225	18091	5.87	200.14	6.36	47.14	-3.64	355.04

NSTARS= 225

IN-ORBIT ANGLE= 0.0 LATITUDE= 0.0 N A 45.00

LEADING INSTR 16948	5.22	186.07	40.29	1.92	-1.96	43.65
LAGGING INSTR 17039	5.87	187.15	-21.58	1.84	-357.41	45.17
LAGGING INSTR 17133	2.84	188.18	-21.88	1.88	-357.81	46.04
LAGGING INSTR 17165	6.12	188.57	-18.74	1.29	-361.69	44.51
LEADING INSTR 17221	6.29	189.31	42.14	2.32	-1.70	46.97
LEADING INSTR 17337	5.97	190.87	40.53	2.31	1.15	47.16

IN-ORBIT ANGLE= 5.0 LATITUDE= 4.9 N A 50.00

LEADING INSTR 16750	5.80	183.63	41.94	1.97	-0.74	43.10
LEADING INSTR 16899	5.98	185.55	43.82	1.03	-1.23	45.55
LAGGING INSTR 17108	6.15	187.92	-17.48	2.29	-357.75	43.33
LEADING INSTR 17127	4.32	188.06	42.61	1.96	1.92	46.40
LAGGING INSTR 17165	6.12	188.57	-18.74	2.38	-356.69	44.51
LAGGING INSTR 17216	6.08	189.27	-15.01	2.28	-361.73	43.06
LAGGING INSTR 17273	6.01	190.04	-17.50	0.60	-359.16	44.92

IN-ORBIT ANGLE= 10.0 LATITUDE= 9.8 N A 55.00

LEADING INSTR 16445	5.07	180.12	44.32	2.47	-1.27	42.69
LAGGING INSTR 17548	6.10	193.55	-13.92	1.12	-360.70	46.01

IN-ORBIT ANGLE= 15.0 LATITUDE= 14.8 N A 60.00

LEADING INSTR 16296	6.46	178.36	47.76	0.95	-1.06	44.40
LAGGING INSTR 17515	5.96	193.16	-9.60	1.30	-361.10	43.95

IN-ORBIT ANGLE= 20.0 LATITUDE= 19.7 N A 65.00

LEADING INSTR 15947	5.99	174.04	51.89	2.48	-3.19	45.99
LEADING INSTR 15970	6.25	174.21	48.11	2.19	-0.24	42.82
LEADING INSTR 16137	3.85	176.09	49.06	0.81	0.80	44.41
LAGGING INSTR 17516	4.91	193.17	-7.71	1.95	-358.66	43.29
LAGGING INSTR 17794	5.26	196.55	-8.49	1.70	-359.11	46.58
LAGGING INSTR 17805	5.70	196.72	-6.25	1.86	-362.14	46.06
LAGGING INSTR 17815	6.44	196.89	-7.69	1.65	-360.30	46.64
LAGGING INSTR 17822	6.20	197.02	-8.90	2.30	-358.77	47.13

IN-ORBIT ANGLE= 25.0 LATITUDE= 24.6 N A 70.00

LEADING INSTR 15789	6.38	172.29	49.20	2.46	2.05	42.99
LEADING INSTR 15797	6.42	172.36	50.06	1.62	1.51	43.77
LEADING INSTR 15947	5.99	174.04	51.89	1.63	1.81	45.99
LAGGING INSTR 17805	5.70	196.72	-6.25	2.30	-357.14	46.06
LAGGING INSTR 17828	4.44	197.07	-3.69	0.88	-360.70	45.73

IN-ORBIT ANGLE= 30.0 LATITUDE= 29.5 N A 75.00

LEADING INSTR 15082	6.34	164.35	53.11	2.30	-3.12	44.30
LEADING INSTR 15485	6.34	168.56	54.02	1.21	0.51	46.16
LAGGING INSTR 17960	6.49	198.69	0.17	1.81	-361.40	46.51

IN-ORBIT ANGLE= 35.0 LATITUDE= 34.4 N A 80.00

LEADING INSTR 14962	5.36	162.91	55.81	1.67	-0.50	46.63
LEADING INSTR 15082	6.34	164.35	53.11	1.49	1.88	44.30
LAGGING INSTR 17993	6.32	198.96	1.36	2.11	-358.07	46.59
LAGGING INSTR 18050	6.23	199.77	4.15	2.50	-361.99	47.05
LAGGING INSTR 18079	5.68	200.02	3.30	2.46	-360.87	47.38

IN-ORBIT ANGLE= 40.0 LATITUDE= 39.3 N A 85.00

LEADING INSTR 14172	6.44	154.55	54.93	2.44	-3.45	44.95
LEADING INSTR 14181	6.22	154.61	55.37	2.45	-3.41	45.39
LEADING INSTR 14427	4.84	157.15	57.16	2.45	-1.16	47.30
LEADING INSTR 14498	6.44	157.93	54.68	0.10	-0.03	44.90
LEADING INSTR 14625	5.72	159.28	54.87	0.93	1.27	45.21
LAGGING INSTR 17995	5.01	199.00	6.68	1.12	-360.39	46.09
LAGGING INSTR 18091	5.87	200.14	6.36	2.24	-360.04	47.24

IN-ORBIT ANGLE= 45.0 LATITUDE= 44.1 N A 90.00

LEADING INSTR 13827	5.74	150.62	55.01	1.68	-2.37	45.05
LEADING INSTR 13842	6.15	150.77	53.49	2.20	-2.35	43.53
LEADING INSTR 14172	6.44	154.55	54.93	1.10	1.55	44.95
LEADING INSTR 14181	6.22	154.61	55.37	1.20	1.59	45.39
LAGGING INSTR 17817	5.55	196.90	11.25	1.66	-1.80	43.91
LAGGING INSTR 17975	5.22	198.80	10.63	1.01	-0.87	45.80

IN-ORBIT ANGLE= 50.0 LATITUDE= 49.0 N A 95.00

LEADING INSTR 13386	6.34	145.23	55.41	2.07	-2.59	45.93
LEADING INSTR 13559	4.54	147.49	55.14	0.52	-0.46	45.40
LEADING INSTR 13827	5.74	150.62	55.01	1.86	2.62	45.05
LEADING INSTR 13842	6.15	150.77	53.49	2.36	2.65	43.53
LAGGING INSTR 17817	5.55	196.90	11.25	2.49	3.20	43.91
LAGGING INSTR 17884	5.82	197.74	12.78	0.77	1.06	44.81
LAGGING INSTR 17933	5.81	198.23	12.55	1.04	1.41	45.29
LAGGING INSTR 17988	5.45	198.92	14.89	1.70	-1.79	46.12

IN-ORBIT ANGLE= 55.0 LATITUDE= 53.8 N A 100.00

LEADING INSTR 12962	6.37	140.68	52.56	2.39	-3.08	43.98
LEADING INSTR 13157	3.26	142.68	52.73	1.45	-0.97	43.72
LEADING INSTR 13212	4.65	143.16	53.08	1.06	-0.36	43.97
LEADING INSTR 13386	6.34	145.23	55.41	1.95	2.41	45.93
LAGGING INSTR 17825	6.18	197.06	18.07	1.14	-1.53	44.64
LAGGING INSTR 17833	4.46	197.11	18.75	1.75	-2.46	44.79

IN-ORBIT ANGLE= 60.0 LATITUDE= 58.5 N A 105.00

LEADING INSTR 12604	4.54	136.66	52.53	1.45	-2.05	45.00
LEADING INSTR 12761	4.89	138.47	54.97	1.89	0.91	46.78
LEADING INSTR 12865	6.12	139.63	52.23	1.19	0.71	43.91
LEADING INSTR 12962	6.37	140.68	52.56	1.69	1.92	43.98
LAGGING INSTR 17654	6.12	194.77	19.61	2.39	0.74	42.66
LAGGING INSTR 17767	6.04	196.20	22.39	2.00	-2.79	44.60
LAGGING INSTR 17825	6.18	197.06	18.07	2.47	3.47	44.64
LAGGING INSTR 17833	4.46	197.11	18.75	1.80	2.54	44.79
LAGGING INSTR 17904	6.48	197.91	19.95	1.07	1.05	45.77
LAGGING INSTR 17970	6.29	198.75	21.00	1.77	-0.18	46.76

IN-ORBIT ANGLE= 65.0 LATITUDE= 63.2 N A 110.00

LEADING INSTR 12604	4.54	136.66	52.53	2.08	2.95	45.00
LAGGING INSTR 17767	6.04	196.20	22.39	1.61	2.21	44.60
LAGGING INSTR 17769	5.90	196.20	23.85	0.14	0.19	44.95
LAGGING INSTR 17877	6.46	197.65	25.48	2.03	-1.51	46.72

IN-ORBIT ANGLE= 70.0 LATITUDE= 67.7 N A 115.00

LEADING INSTR 11965	6.21	130.20	47.73	2.13	-1.61	43.19
LAGGING INSTR 17787	4.90	196.41	28.86	1.88	-1.43	46.57
LAGGING INSTR 17796	6.40	196.59	28.79	1.93	-1.26	46.71

IN-ORBIT ANGLE= 75.0 LATITUDE= 72.0 N A 120.00

LEADING INSTR 11534	6.33	126.35	46.43	1.33	-1.29	44.02
LAGGING INSTR 17455	5.07	192.54	28.79	2.30	1.87	43.10
LAGGING INSTR 17647	5.08	194.69	32.03	1.51	-1.31	46.19
LAGGING INSTR 17764	6.44	196.16	30.26	2.17	1.65	46.82

IN-ORBIT ANGLE= 80.0 LATITUDE= 75.9 N A 125.00

LEADING INSTR 10995	6.24	121.24	43.92	2.16	-3.05	45.13
LEADING INSTR 11401	4.43	125.16	43.93	2.21	0.23	42.80
LAGGING INSTR 17517	6.26	193.17	34.78	1.15	-0.59	46.07

IN-ORBIT ANGLE= 85.0 LATITUDE= 78.8 N A 130.00

LEADING INSTR 10757	6.47	119.01	44.06	1.65	0.41	46.62
LEADING INSTR 10995	6.24	121.24	43.92	1.39	1.95	45.13
LEADING INSTR 11049	6.44	121.80	43.11	1.32	1.53	44.23
LAGGING INSTR 17231	6.32	189.43	37.22	0.93	-0.89	44.32
LAGGING INSTR 17430	5.86	192.16	38.77	2.30	-1.00	47.18

IN-ORBIT ANGLE= 90.0 LATITUDE= 80.0 N A 135.00

LAGGING INSTR 16948	5.22	186.07	40.29	1.92	-1.96	43.65
LAGGING INSTR 17221	6.29	189.31	42.14	2.32	-1.70	46.97
LAGGING INSTR 17337	5.97	190.87	40.53	2.31	1.15	47.16

IN-ORBIT ANGLE= 95.0 LATITUDE= 78.8 N D 140.00

LEADING INSTR 10237	5.61	114.11	35.12	2.31	-3.24	45.19
LEADING INSTR 10288	5.89	114.52	38.42	1.65	1.01	46.49
LEADING INSTR 10460	5.45	116.13	37.60	0.77	1.06	44.85
LAGGING INSTR 16750	5.80	183.63	41.94	1.97	-0.74	43.10
LAGGING INSTR 16899	5.98	185.55	43.82	1.03	-1.23	45.55
LAGGING INSTR 17127	4.32	188.06	42.61	1.96	1.92	46.40

IN-ORBIT ANGLE= 100.0 LATITUDE= 75.9 N D 145.00

LEADING INSTR 10120	1.58	113.14	31.96	2.03	-2.83	44.61
LEADING INSTR 10237	5.61	114.11	35.12	1.26	1.76	45.19
LEADING INSTR 10257	4.92	114.27	34.66	0.91	1.27	44.85
LEADING INSTR 10280	6.14	114.46	32.08	1.98	-1.92	43.55
LEADING INSTR 10354	6.00	115.16	34.08	1.37	1.07	43.86
LEADING INSTR 10482	5.29	116.36	33.50	2.50	1.07	42.62
LAGGING INSTR 16445	5.07	180.12	44.32	2.47	-1.27	42.69

IN-ORBIT ANGLE= 105.0 LATITUDE= 72.0 N D 150.00

LEADING INSTR 9987	4.18	111.76	31.85	1.19	1.31	45.73
LEADING INSTR 10120	1.58	113.14	31.96	1.58	2.17	44.61
LEADING INSTR 10137	5.34	113.28	31.03	1.14	1.03	44.12
LAGGING INSTR 16296	6.46	178.36	47.76	0.95	-1.06	44.40

IN-ORBIT ANGLE= 110.0 LATITUDE= 67.7 N D 155.00

LEADING INSTR 9627	5.87	108.49	27.95	2.29	-0.19	47.28
LEADING INSTR 9843	5.08	110.38	25.11	2.31	-3.25	44.73
LEADING INSTR 9868	5.71	110.64	27.70	0.35	0.35	45.25
LEADING INSTR 9897	3.89	110.94	27.86	0.49	0.69	45.04
LEADING INSTR 9997	5.04	111.84	28.19	1.26	1.52	44.34
LEADING INSTR 10015	5.09	111.96	27.98	1.24	1.31	44.16
LAGGING INSTR 15947	5.99	174.04	51.89	2.48	-3.19	45.99
LAGGING INSTR 15970	6.25	174.21	48.11	2.19	-0.24	42.82
LAGGING INSTR 16137	3.85	176.09	49.06	0.81	0.80	44.41

IN-ORBIT ANGLE= 115.0 LATITUDE= 63.2 N D 160.00

LEADING INSTR 9521	5.76	107.62	24.18	2.10	-0.45	47.08
LEADING INSTR 9585	6.02	108.19	24.94	1.81	0.74	46.73
LEADING INSTR 9755	3.51	109.55	22.04	1.97	-2.76	44.76
LEADING INSTR 9843	5.08	110.38	25.11	1.26	1.75	44.73
LEADING INSTR 9844	6.02	110.39	23.01	1.15	-1.16	44.19
LAGGING INSTR 15789	6.38	172.29	49.20	2.46	2.05	42.99
LAGGING INSTR 15797	6.42	172.36	50.06	1.62	1.51	43.77
LAGGING INSTR 15947	5.99	174.04	51.89	1.63	1.81	45.99

IN-ORBIT ANGLE= 120.0 LATITUDE= 58.5 N D 165.00

LEADING INSTR 9462	6.46	107.05	21.30	2.05	0.54	47.01
LEADING INSTR 9755	3.51	109.55	22.04	1.60	2.24	44.76
LEADING INSTR 9808	5.16	110.02	20.51	1.01	0.22	44.01
LEADING INSTR 9934	6.45	111.24	21.60	2.44	2.13	43.06
LEADING INSTR 9937	5.88	111.26	20.32	2.24	0.30	42.77
LAGGING INSTR 15082	6.34	164.35	53.11	2.30	-3.12	44.30
LAGGING INSTR 15485	6.34	168.56	54.02	1.21	0.51	46.16

IN-ORBIT ANGLE= 125.0 LATITUDE= 53.8 N D 170.00

LEADING INSTR 9421	5.58	106.63	15.98	2.09	-1.76	46.66
LEADING INSTR 9551	5.31	107.88	16.21	1.00	-1.26	45.45
LEADING INSTR 9701	3.65	109.06	16.60	0.77	-0.53	44.33
LEADING INSTR 9759	6.47	109.57	15.20	2.17	-2.45	43.68
LAGGING INSTR 14962	5.36	162.91	55.81	1.67	-0.50	46.63
LAGGING INSTR 15082	6.34	164.35	53.11	1.49	1.88	44.30

IN-ORBIT ANGLE= 130.0 LATITUDE= 49.0 N D 175.00

LEADING INSTR 9592	5.84	108.19	12.17	1.36	-1.92	44.85
LEADING INSTR 9759	6.47	109.57	15.20	2.22	2.55	43.68
LAGGING INSTR 14172	6.44	154.55	54.93	2.44	-3.45	44.95
LAGGING INSTR 14181	6.22	154.61	55.37	2.45	-3.41	45.39
LAGGING INSTR 14427	4.84	157.15	57.16	2.45	-1.16	47.30
LAGGING INSTR 14498	6.44	157.93	54.68	0.10	-0.03	44.90
LAGGING INSTR 14625	5.72	159.28	54.87	0.93	1.27	45.21

IN-ORBIT ANGLE= 135.0 LATITUDE= 44.1 N D 180.00

LEADING INSTR 9355	6.02	105.97	9.24	2.16	-1.04	47.03
LEADING INSTR 9592	5.84	108.19	12.17	2.18	3.08	44.85
LEADING INSTR 9628	5.97	108.48	8.03	2.02	-2.80	44.55
LAGGING INSTR 13827	5.74	150.62	55.01	1.68	-2.37	45.05
LAGGING INSTR 13842	6.15	150.77	53.49	2.20	-2.35	43.53
LAGGING INSTR 14172	6.44	154.55	54.93	1.10	1.55	44.95
LAGGING INSTR 14181	6.22	154.61	55.37	1.20	1.59	45.39

IN-ORBIT ANGLE= 140.0 LATITUDE= 39.3 N D 185.00

LEADING INSTR 9394	5.95	106.35	4.96	2.31	-1.91	46.86
LEADING INSTR 9409	5.92	106.52	7.52	1.90	1.59	46.53
LEADING INSTR 9516	6.04	107.54	5.71	0.95	-1.01	45.62
LEADING INSTR 9524	6.22	107.60	5.53	1.06	-1.27	45.57
LEADING INSTR 9628	5.97	108.48	8.03	1.61	2.20	44.55
LEADING INSTR 9679	6.44	108.89	6.74	0.83	0.32	44.20
LEADING INSTR 9752	5.95	109.52	7.20	1.59	0.94	43.55
LAGGING INSTR 13386	6.34	145.23	55.41	2.07	-2.59	45.93
LAGGING INSTR 13559	4.54	147.49	55.14	0.52	-0.46	45.40
LAGGING INSTR 13827	5.74	150.62	55.01	1.86	2.62	45.05
LAGGING INSTR 13842	6.15	150.77	53.49	2.36	2.65	43.53

IN-ORBIT ANGLE= 145.0 LATITUDE= 34.4 N D 190.00

LEADING INSTR 9590	5.56	108.16	3.17	0.35	0.36	45.24
LEADING INSTR 9739	6.06	109.43	2.80	0.99	-0.38	44.05
LAGGING INSTR 12962	6.37	140.68	52.56	2.39	-3.08	43.98
LAGGING INSTR 13157	3.26	142.68	52.73	1.45	-0.97	43.72
LAGGING INSTR 13212	4.65	143.16	53.08	1.06	-0.36	43.97
LAGGING INSTR 13386	6.34	145.23	55.41	1.95	2.41	45.93

IN-ORBIT ANGLE= 150.0 LATITUDE= 29.5 N D 195.00

LEADING INSTR 9505	5.40	107.44	0.19	1.70	1.38	46.38
LEADING INSTR 9518	4.09	107.56	0.38	1.69	1.62	46.23
LEADING INSTR 9589	6.12	108.15	-2.15	1.81	-1.98	46.13
LEADING INSTR 9821	6.00	110.10	0.24	1.35	0.82	43.78
LEADING INSTR 9827	6.30	110.18	-1.08	1.28	-1.08	43.96
LAGGING INSTR 12604	4.54	136.66	52.53	1.45	-2.05	45.00
LAGGING INSTR 12761	4.89	138.47	54.97	1.89	0.91	46.78
LAGGING INSTR 12865	6.12	139.63	52.23	1.19	0.71	43.91
LAGGING INSTR 12962	6.37	140.68	52.56	1.69	1.92	43.98

IN-ORBIT ANGLE= 155.0 LATITUDE= 24.6 N D 200.00

LEADING INSTR 9589	6.12	108.15	-2.15	2.43	3.02	46.13
LEADING INSTR 9698	6.36	108.99	-5.38	1.58	-1.60	46.09
LEADING INSTR 9833	5.83	110.21	-4.08	0.43	-0.27	44.62
LEADING INSTR 9923	6.08	111.07	-4.29	1.28	-0.87	43.87
LEADING INSTR 9930	6.47	111.12	-3.53	1.38	0.18	43.63
LAGGING INSTR 12604	4.54	136.66	52.53	2.08	2.95	45.00

IN-ORBIT ANGLE= 160.0 LATITUDE= 19.7 N D 205.00

LEADING INSTR 9804	6.50	109.94	-7.18	0.86	0.63	45.73
LEADING INSTR 9823	6.17	110.12	-7.08	0.73	0.69	45.53
LEADING INSTR 10023	5.99	111.97	-6.51	1.41	0.69	43.68
LEADING INSTR 10054	5.60	112.32	-8.29	1.69	-1.89	43.95
LEADING INSTR 10090	6.02	112.64	-7.19	1.76	-0.53	43.28
LAGGING INSTR 11965	6.21	130.20	47.73	2.13	-1.61	43.19

IN-ORBIT ANGLE= 165.0 LATITUDE= 14.8 N D 210.00

LEADING INSTR 9905	5.82	110.92	-12.31	1.95	-1.48	46.64
LEADING INSTR 9979	5.86	111.59	-10.51	0.52	0.51	45.38
LEADING INSTR 10022	6.00	111.96	-9.74	0.97	1.34	44.77
LEADING INSTR 10027	5.94	111.98	-13.07	2.37	-2.98	46.04
LEADING INSTR 10054	5.60	112.32	-8.29	2.42	3.11	43.95
LAGGING INSTR 11534	6.33	126.35	46.43	1.33	-1.29	44.02

IN-ORBIT ANGLE= 170.0 LATITUDE= 9.8 N D 215.00

LEADING INSTR 10027	5.94	111.98	-13.07	1.78	2.02	46.04
LEADING INSTR 10113	6.24	112.97	-13.73	0.67	0.64	45.49
LEADING INSTR 10122	5.06	113.08	-13.55	0.66	0.82	45.32
LEADING INSTR 10189	5.57	113.65	-13.58	0.35	0.46	44.87
LEADING INSTR 10242	6.42	114.04	-13.63	0.45	0.16	44.57
LEADING INSTR 10328	5.15	114.73	-14.81	1.30	-1.74	44.55
LEADING INSTR 10455	6.06	116.00	-13.39	2.20	-0.70	42.86
LEADING INSTR 10469	5.11	116.12	-13.52	2.27	-0.94	42.82
LAGGING INSTR 10995	6.24	121.24	43.92	2.16	-3.05	45.13
LAGGING INSTR 11401	4.43	125.16	43.93	2.21	0.23	42.80

IN-ORBIT ANGLE= 175.0 LATITUDE= 4.9 N D 220.00

LEADING INSTR 10208	5.66	113.82	-18.37	2.03	-0.52	47.00
LEADING INSTR 10290	6.44	114.42	-17.40	1.06	0.27	46.04
LEADING INSTR 10322	6.08	114.70	-18.41	1.57	-1.12	46.35
LEADING INSTR 10328	5.15	114.73	-14.81	2.34	3.26	44.55
LEADING INSTR 10569	5.54	117.06	-16.85	1.36	-0.78	43.75
LEADING INSTR 10582	6.40	117.17	-18.56	2.09	-2.92	44.59
LAGGING INSTR 10757	6.47	119.01	44.06	1.65	0.41	46.62
LAGGING INSTR 10995	6.24	121.24	43.92	1.39	1.95	45.13
LAGGING INSTR 11049	6.44	121.80	43.11	1.32	1.53	44.23

IN-ORBIT ANGLE= 180.0 LATITUDE= 0.0 N D 225.00

LEADING INSTR 10501	5.84	116.46	-21.56	1.91	-0.89	46.80
LEADING INSTR 10572	6.48	117.09	-19.88	0.58	0.60	45.39
LEADING INSTR 10582	6.40	117.17	-18.56	1.52	2.08	44.59
LEADING INSTR 10632	5.78	117.58	-20.91	0.92	-0.93	45.64
LEADING INSTR 10756	4.35	118.87	-21.21	1.55	-2.19	44.93

IN-ORBIT ANGLE= 185.0 LATITUDE= 4.9 S D 230.00

LAGGING INSTR 10237	5.61	114.11	35.12	2.31	-3.24	45.19
LAGGING INSTR 10288	5.89	114.52	38.42	1.65	1.01	46.49
LAGGING INSTR 10460	5.45	116.13	37.60	0.77	1.06	44.85
LEADING INSTR 10756	4.35	118.87	-21.21	1.98	2.81	44.93
LEADING INSTR 10805	5.22	119.43	-22.78	0.70	0.65	45.53
LEADING INSTR 11034	2.88	121.55	-22.36	1.16	-0.53	43.90

IN-ORBIT ANGLE= 190.0 LATITUDE= 9.8 S D 235.00

LAGGING INSTR 10120	1.58	113.14	31.96	2.03	-2.83	44.61
LAGGING INSTR 10237	5.61	114.11	35.12	1.26	1.76	45.19
LAGGING INSTR 10257	4.92	114.27	34.66	0.91	1.27	44.85
LAGGING INSTR 10280	6.14	114.46	32.08	1.98	-1.92	43.55
LAGGING INSTR 10354	6.00	115.16	34.08	1.37	1.07	43.86
LAGGING INSTR 10482	5.29	116.36	33.50	2.50	1.07	42.62
LEADING INSTR 11443	5.86	125.37	-24.39	2.07	-0.88	43.02

IN-ORBIT ANGLE= 195.0 LATITUDE= 14.8 S D 240.00

LAGGING INSTR 9987	4.18	111.76	31.85	1.19	1.31	45.73
LAGGING INSTR 10120	1.58	113.14	31.96	1.58	2.17	44.61
LAGGING INSTR 10137	5.34	113.28	31.03	1.14	1.03	44.12
LEADING INSTR 11322	6.43	124.17	-28.71	2.02	1.03	46.88
LEADING INSTR 11569	6.28	126.50	-29.09	1.33	-1.22	46.00
LEADING INSTR 11624	6.50	127.03	-25.44	2.37	1.61	42.91
LEADING INSTR 11723	6.36	127.90	-29.24	1.87	-2.55	45.46
LEADING INSTR 11786	5.88	128.53	-25.95	2.47	-0.27	42.54

IN-ORBIT ANGLE= 200.0 LATITUDE= 19.7 S D 245.00

LAGGING INSTR 9627	5.87	108.49	27.95	2.29	-0.19	47.28
LAGGING INSTR 9843	5.08	110.38	25.11	2.31	-3.25	44.73
LAGGING INSTR 9868	5.71	110.64	27.70	0.35	0.35	45.25
LAGGING INSTR 9897	3.89	110.94	27.86	0.49	0.69	45.04
LAGGING INSTR 9997	5.04	111.84	28.19	1.26	1.52	44.34
LAGGING INSTR 10015	5.09	111.96	27.98	1.24	1.31	44.16
LEADING INSTR 11651	5.63	127.30	-30.61	2.26	1.83	46.84
LEADING INSTR 11723	6.36	127.90	-29.24	1.80	2.45	45.46
LEADING INSTR 11765	6.38	128.31	-30.20	1.40	1.30	46.06
LEADING INSTR 11839	6.50	129.06	-31.06	1.44	-0.02	46.44
LEADING INSTR 12018	3.70	130.58	-31.64	1.83	-1.78	46.31
LEADING INSTR 12195	5.23	132.14	-30.08	1.59	-2.06	44.36
LEADING INSTR 12262	6.50	132.78	-30.36	2.12	-2.87	44.35

IN-ORBIT ANGLE= 205.0 LATITUDE= 24.6 S D 250.00

LAGGING INSTR 9521	5.76	107.62	24.18	2.10	-0.45	47.08
LAGGING INSTR 9585	6.02	108.19	24.94	1.81	0.74	46.73
LAGGING INSTR 9755	3.51	109.55	22.04	1.97	-2.76	44.76
LAGGING INSTR 9843	5.08	110.38	25.11	1.26	1.75	44.73
LAGGING INSTR 9844	6.02	110.39	23.01	1.15	-1.16	44.19
LEADING INSTR 12126	6.38	131.39	-32.22	2.11	2.09	46.49
LEADING INSTR 12195	5.23	132.14	-30.08	2.16	2.94	44.36
LEADING INSTR 12262	6.50	132.78	-30.36	1.63	2.13	44.35

IN-ORBIT ANGLE= 210.0 LATITUDE= 29.5 S D 255.00

LAGGING INSTR 9462	6.46	107.05	21.30	2.05	0.54	47.01
LAGGING INSTR 9755	3.51	109.55	22.04	1.60	2.24	44.76
LAGGING INSTR 9808	5.16	110.02	20.51	1.01	0.22	44.01
LAGGING INSTR 9934	6.45	111.24	21.60	2.44	2.13	43.06
LAGGING INSTR 9937	5.88	111.26	20.32	2.24	0.30	42.77
LEADING INSTR 12773	6.04	138.42	-35.35	2.28	-1.04	47.15
LEADING INSTR 12787	4.70	138.62	-35.55	2.47	-1.30	47.28
LEADING INSTR 12873	6.48	139.62	-32.87	0.85	-1.00	44.52
LEADING INSTR 12893	6.10	139.80	-35.40	2.50	-2.31	46.87
LEADING INSTR 13055	6.48	141.58	-34.00	2.42	-3.41	45.16

IN-ORBIT ANGLE= 215.0 LATITUDE= 34.4 S D 260.00

LAGGING INSTR 9421	5.58	106.63	15.98	2.09	-1.76	46.66
LAGGING INSTR 9551	5.31	107.88	16.21	1.00	-1.26	45.45
LAGGING INSTR 9701	3.65	109.06	16.60	0.77	-0.53	44.33
LAGGING INSTR 9759	6.47	109.57	15.20	2.17	-2.45	43.68
LEADING INSTR 12971	6.48	140.61	-35.23	2.11	2.01	46.54
LEADING INSTR 13055	6.48	141.58	-34.00	1.14	1.59	45.16
LEADING INSTR 13091	4.64	141.98	-33.06	1.37	1.56	44.17
LEADING INSTR 13154	5.96	142.55	-33.31	0.93	0.89	44.31
LEADING INSTR 13248	6.48	143.47	-33.20	0.96	0.00	44.04
LEADING INSTR 13306	6.09	144.03	-34.94	1.02	-1.12	45.64
LEADING INSTR 13404	6.41	145.33	-33.55	1.68	-2.01	44.09

IN-ORBIT ANGLE= 220.0 LATITUDE= 39.3 S D 265.00

LAGGING INSTR 9592	5.84	108.19	12.17	1.36	-1.92	44.85
LAGGING INSTR 9759	6.47	109.57	15.20	2.22	2.55	43.68
LEADING INSTR 13404	6.41	145.33	-33.55	2.29	2.99	44.09
LEADING INSTR 13539	6.05	147.03	-35.89	1.30	0.76	46.19
LEADING INSTR 13543	6.30	147.12	-34.81	0.64	0.88	45.11
LEADING INSTR 13741	5.25	149.37	-33.21	1.85	-1.15	43.33
LEADING INSTR 13870	6.28	150.97	-34.73	2.09	-2.95	44.77

IN-ORBIT ANGLE= 225.0 LATITUDE= 44.1 S D 270.00

LAGGING INSTR 9355	6.02	105.97	9.24	2.16	-1.04	47.03
LAGGING INSTR 9592	5.84	108.19	12.17	2.18	3.08	44.85
LAGGING INSTR 9628	5.97	108.48	8.03	2.02	-2.80	44.55
LEADING INSTR 13870	6.28	150.97	-34.73	1.47	2.05	44.77
LEADING INSTR 13928	6.36	151.66	-35.79	1.23	1.30	45.81
LEADING INSTR 13961	6.28	152.04	-33.27	1.86	1.02	43.28
LEADING INSTR 14081	6.25	153.49	-34.63	0.51	-0.49	44.63
LEADING INSTR 14155	6.40	154.31	-34.35	1.13	-1.33	44.36
LEADING INSTR 14281	5.40	155.52	-35.16	1.79	-2.50	45.21

IN-ORBIT ANGLE= 230.0 LATITUDE= 49.0 S D 275.00

LAGGING INSTR 9394	5.95	106.35	4.96	2.31	-1.91	46.86
LAGGING INSTR 9409	5.92	106.52	7.52	1.90	1.59	46.53
LAGGING INSTR 9516	6.04	107.54	5.71	0.95	-1.01	45.62
LAGGING INSTR 9524	6.22	107.60	5.53	1.06	-1.27	45.57
LAGGING INSTR 9628	5.97	108.48	8.03	1.61	2.20	44.55
LAGGING INSTR 9679	6.44	108.89	6.74	0.83	0.32	44.20
LAGGING INSTR 9752	5.95	109.52	7.20	1.59	0.94	43.55
LEADING INSTR 14281	5.40	155.52	-35.16	1.78	2.50	45.21

IN-ORBIT ANGLE= 235.0 LATITUDE= 53.8 S D 280.00

LAGGING INSTR 9590	5.56	108.16	3.17	0.35	0.36	45.24
LAGGING INSTR 9739	6.06	109.43	2.80	0.99	-0.38	44.05
LEADING INSTR 15047	4.70	163.81	-34.10	0.69	-0.95	45.14
LEADING INSTR 15238	5.53	165.85	-33.44	2.27	-3.22	44.93

IN-ORBIT ANGLE= 240.0 LATITUDE= 58.5 S D 285.00

LAGGING INSTR 9505	5.40	107.44	0.19	1.70	1.38	46.38
LAGGING INSTR 9518	4.09	107.56	0.38	1.69	1.62	46.23
LAGGING INSTR 9589	6.12	108.15	-2.15	1.81	-1.98	46.13
LAGGING INSTR 9821	6.00	110.10	0.24	1.35	0.82	43.78
LAGGING INSTR 9827	6.30	110.18	-1.08	1.28	-1.08	43.96
LEADING INSTR 15238	5.53	165.85	-33.44	1.26	1.78	44.93
LEADING INSTR 15350	5.76	167.09	-30.88	2.22	-0.70	42.83
LEADING INSTR 15398	6.46	167.68	-30.82	2.27	-1.35	42.94
LEADING INSTR 15523	6.24	168.92	-35.24	2.39	-0.21	47.38
LEADING INSTR 15530	6.45	169.03	-32.52	1.24	-1.76	44.89
LEADING INSTR 15641	5.12	170.41	-33.10	2.12	-2.74	45.84

IN-ORBIT ANGLE= 245.0 LATITUDE= 63.2 S D 290.00

LAGGING INSTR 9589	6.12	108.15	-2.15	2.43	3.02	46.13
LAGGING INSTR 9698	6.36	108.99	-5.38	1.58	-1.60	46.09
LAGGING INSTR 9833	5.83	110.21	-4.08	0.43	-0.27	44.62
LAGGING INSTR 9923	6.08	111.07	-4.29	1.28	-0.87	43.87
LAGGING INSTR 9930	6.47	111.12	-3.53	1.38	0.18	43.63
LEADING INSTR 15530	6.45	169.03	-32.52	2.29	3.24	44.89
LEADING INSTR 15641	5.12	170.41	-33.10	1.82	2.26	45.84
LEADING INSTR 15680	5.34	170.98	-33.20	1.69	1.80	46.10
LEADING INSTR 15735	6.49	171.60	-33.94	2.31	1.68	46.96
LEADING INSTR 15845	3.72	172.86	-29.42	2.35	-2.45	43.40
LEADING INSTR 15873	6.14	173.23	-30.39	1.62	-2.12	44.38
LEADING INSTR 15917	5.87	173.75	-31.71	1.40	-1.68	45.72
LEADING INSTR 15930	6.44	173.86	-30.29	2.01	-2.78	44.54
LEADING INSTR 16019	4.88	174.65	-32.53	2.24	-1.91	46.77

IN-ORBIT ANGLE= 250.0 LATITUDE= 67.7 S D 295.00

LAGGING INSTR 9804	6.50	109.94	-7.18	0.86	0.63	45.73
LAGGING INSTR 9823	6.17	110.12	-7.08	0.73	0.69	45.53
LAGGING INSTR 10023	5.99	111.97	-6.51	1.41	0.69	43.68
LAGGING INSTR 10054	5.60	112.32	-8.29	1.69	-1.89	43.95
LAGGING INSTR 10090	6.02	112.64	-7.19	1.76	-0.53	43.28
LEADING INSTR 15845	3.72	172.86	-29.42	2.39	2.55	43.40
LEADING INSTR 15873	6.14	173.23	-30.39	2.11	2.88	44.38
LEADING INSTR 15917	5.87	173.75	-31.71	2.47	3.32	45.72
LEADING INSTR 15930	6.44	173.86	-30.29	1.63	2.22	44.54
LEADING INSTR 16055	5.31	175.03	-30.78	1.14	1.49	45.42
LEADING INSTR 16236	5.96	177.52	-28.46	1.87	-2.58	44.57
LEADING INSTR 16258	4.40	177.82	-31.37	2.10	-0.48	47.07

IN-ORBIT ANGLE= 255.0 LATITUDE= 72.0 S D 300.00

LAGGING INSTR 9905	5.82	110.92	-12.31	1.95	-1.48	46.64
LAGGING INSTR 9979	5.86	111.59	-10.51	0.52	0.51	45.38
LAGGING INSTR 10022	6.00	111.96	-9.74	0.97	1.34	44.77
LAGGING INSTR 10027	5.94	111.98	-13.07	2.37	-2.98	46.04
LAGGING INSTR 10054	5.60	112.32	-8.29	2.42	3.11	43.95
LEADING INSTR 16236	5.96	177.52	-28.46	1.76	2.42	44.57
LEADING INSTR 16312	6.12	178.51	-26.80	1.27	0.08	43.73

IN-ORBIT ANGLE= 260.0 LATITUDE= 75.9 S D 305.00

LAGGING INSTR 10027	5.94	111.98	-13.07	1.78	2.02	46.04
LAGGING INSTR 10113	6.24	112.97	-13.73	0.67	0.64	45.49
LAGGING INSTR 10122	5.06	113.08	-13.55	0.66	0.82	45.32
LAGGING INSTR 10189	5.57	113.65	-13.58	0.35	0.46	44.87
LAGGING INSTR 10242	6.42	114.04	-13.63	0.45	0.16	44.57
LAGGING INSTR 10328	5.15	114.73	-14.81	1.30	-1.74	44.55
LAGGING INSTR 10455	6.06	116.00	-13.39	2.20	-0.70	42.86
LAGGING INSTR 10469	5.11	116.12	-13.52	2.27	-0.94	42.82

IN-ORBIT ANGLE= 265.0 LATITUDE= 78.8 S D 310.00

LAGGING INSTR 10208	5.66	113.82	-18.37	2.03	-0.52	47.00
LAGGING INSTR 10290	6.44	114.42	-17.40	1.06	0.27	46.04
LAGGING INSTR 10322	6.08	114.70	-18.41	1.57	-1.12	46.35
LAGGING INSTR 10328	5.15	114.73	-14.81	2.34	3.26	44.55
LAGGING INSTR 10569	5.54	117.06	-16.85	1.36	-0.78	43.75
LAGGING INSTR 10582	6.40	117.17	-18.56	2.09	-2.92	44.59
LEADING INSTR 16739	6.42	183.53	-21.93	2.05	0.81	43.02
LEADING INSTR 16887	5.81	185.42	-22.44	0.45	-0.15	44.57
LEADING INSTR 17039	5.87	187.15	-21.58	1.71	-2.41	45.17
LEADING INSTR 17133	2.84	188.18	-21.88	2.26	-2.81	46.04

IN-ORBIT ANGLE= 270.0 LATITUDE= 80.0 S A 315.00

LAGGING INSTR 10501	5.84	116.46	-21.56	1.91	-0.89	46.80
LAGGING INSTR 10572	6.48	117.09	-19.88	0.58	0.60	45.39
LAGGING INSTR 10582	6.40	117.17	-18.56	1.52	2.08	44.59
LAGGING INSTR 10632	5.78	117.58	-20.91	0.92	-0.93	45.64
LAGGING INSTR 10756	4.35	118.87	-21.21	1.55	-2.19	44.93
LEADING INSTR 17039	5.87	187.15	-21.58	1.84	2.59	45.17
LEADING INSTR 17133	2.84	188.18	-21.88	1.88	2.19	46.04
LEADING INSTR 17165	6.12	188.57	-18.74	1.29	-1.69	44.51

IN-ORBIT ANGLE= 275.0 LATITUDE= 78.8 S A 320.00

LAGGING INSTR 10756	4.35	118.87	-21.21	1.98	2.81	44.93
LAGGING INSTR 10805	5.22	119.43	-22.78	0.70	0.65	45.53
LAGGING INSTR 11034	2.88	121.55	-22.36	1.16	-0.53	43.90
LEADING INSTR 17108	6.15	187.92	-17.48	2.29	2.25	43.33
LEADING INSTR 17165	6.12	188.57	-18.74	2.38	3.31	44.51
LEADING INSTR 17216	6.08	189.27	-15.01	2.28	-1.74	43.06
LEADING INSTR 17273	6.01	190.04	-17.50	0.60	0.84	44.92

IN-ORBIT ANGLE= 280.0 LATITUDE= 75.9 S A 325.00

LAGGING INSTR 11443	5.86	125.37	-24.39	2.07	-0.88	43.02
LEADING INSTR 17548	6.10	193.55	-13.92	1.12	-0.70	46.01

IN-ORBIT ANGLE= 285.0 LATITUDE= 72.0 S A 330.00

LAGGING INSTR 11322	6.43	124.17	-28.71	2.02	1.03	46.88
LAGGING INSTR 11569	6.28	126.50	-29.09	1.33	-1.22	46.00
LAGGING INSTR 11624	6.50	127.03	-25.44	2.37	1.61	42.91
LAGGING INSTR 11723	6.36	127.90	-29.24	1.87	-2.55	45.46
LAGGING INSTR 11786	5.88	128.53	-25.95	2.47	-0.27	42.54
LEADING INSTR 17515	5.96	193.16	-9.60	1.30	-1.10	43.95

IN-ORBIT ANGLE= 290.0 LATITUDE= 67.7 S A 335.00

LAGGING INSTR 11651	5.63	127.30	-30.61	2.26	1.83	46.84
LAGGING INSTR 11723	6.36	127.90	-29.24	1.80	2.45	45.46
LAGGING INSTR 11765	6.38	128.31	-30.20	1.40	1.30	46.06
LAGGING INSTR 11839	6.50	129.06	-31.06	1.44	-0.02	46.44
LAGGING INSTR 12018	3.70	130.58	-31.64	1.83	-1.78	46.31
LAGGING INSTR 12195	5.23	132.14	-30.08	1.59	-2.06	44.36
LAGGING INSTR 12262	6.50	132.78	-30.36	2.12	-2.87	44.35
LEADING INSTR 17516	4.91	193.17	-7.71	1.95	1.34	43.29
LEADING INSTR 17794	5.26	196.55	-8.49	1.70	0.89	46.58
LEADING INSTR 17805	5.70	196.72	-6.25	1.86	-2.14	46.06
LEADING INSTR 17815	6.44	196.89	-7.69	1.65	-0.30	46.64
LEADING INSTR 17822	6.20	197.02	-8.90	2.30	1.23	47.13

IN-ORBIT ANGLE= 295.0 LATITUDE= 63.2 S A 340.00

LAGGING INSTR 12126	6.38	131.39	-32.22	2.11	2.09	46.49
LAGGING INSTR 12195	5.23	132.14	-30.08	2.16	2.94	44.36
LAGGING INSTR 12262	6.50	132.78	-30.36	1.63	2.13	44.35
LEADING INSTR 17805	5.70	196.72	-6.25	2.30	2.86	46.06
LEADING INSTR 17828	4.44	197.07	-3.69	0.88	-0.70	45.73

IN-ORBIT ANGLE= 300.0 LATITUDE= 58.5 S A 345.00

LAGGING INSTR 12773	6.04	138.42	-35.35	2.28	-1.04	47.15
LAGGING INSTR 12787	4.70	138.62	-35.55	2.47	-1.30	47.28
LAGGING INSTR 12873	6.48	139.62	-32.87	0.85	-1.00	44.52
LAGGING INSTR 12893	6.10	139.80	-35.40	2.50	-2.31	46.87
LAGGING INSTR 13055	6.48	141.58	-34.00	2.42	-3.41	45.16
LEADING INSTR 17960	6.49	198.69	0.17	1.81	-1.40	46.51

IN-ORBIT ANGLE= 305.0 LATITUDE= 53.8 S A 350.00

LAGGING INSTR 12971	6.48	140.61	-35.23	2.11	2.01	46.54
LAGGING INSTR 13055	6.48	141.58	-34.00	1.14	1.59	45.16
LAGGING INSTR 13091	4.64	141.98	-33.06	1.37	1.56	44.17
LAGGING INSTR 13154	5.96	142.55	-33.31	0.93	0.89	44.31
LAGGING INSTR 13248	6.48	143.47	-33.20	0.96	0.00	44.04
LAGGING INSTR 13306	6.09	144.03	-34.94	1.02	-1.12	45.64
LAGGING INSTR 13404	6.41	145.33	-33.55	1.68	-2.01	44.09
LEADING INSTR 17993	6.32	198.96	1.36	2.11	1.93	46.59
LEADING INSTR 18050	6.23	199.77	4.15	2.50	-2.00	47.05
LEADING INSTR 18079	5.68	200.02	3.30	2.46	-0.87	47.38

IN-ORBIT ANGLE= 310.0 LATITUDE= 49.0 S A 355.00

LAGGING INSTR 13404	6.41	145.33	-33.55	2.29	2.99	44.09
LAGGING INSTR 13539	6.05	147.03	-35.89	1.30	0.76	46.19
LAGGING INSTR 13543	6.30	147.12	-34.81	0.64	0.88	45.11
LAGGING INSTR 13741	5.25	149.37	-33.21	1.85	-1.15	43.33
LAGGING INSTR 13870	6.28	150.97	-34.73	2.09	-2.95	44.77
LEADING INSTR 17995	5.01	199.00	6.68	1.12	-0.39	46.09
LEADING INSTR 18091	5.87	200.14	6.36	2.24	-0.04	47.24

IN-ORBIT ANGLE= 315.0 LATITUDE= 44.1 S A 360.00

LAGGING INSTR 13870	6.28	150.97	-34.73	1.47	2.05	44.77
LAGGING INSTR 13928	6.36	151.66	-35.79	1.23	1.30	45.81
LAGGING INSTR 13961	6.28	152.04	-33.27	1.86	1.02	43.28
LAGGING INSTR 14081	6.25	153.49	-34.63	0.51	-0.49	44.63
LAGGING INSTR 14155	6.40	154.31	-34.35	1.13	-1.33	44.36
LAGGING INSTR 14281	5.40	155.52	-35.16	1.79	-2.50	45.21
LEADING INSTR 17817	5.95	196.90	11.25	1.66	358.20	43.91
LEADING INSTR 17975	5.22	198.80	10.63	1.01	359.13	45.80

IN-ORBIT ANGLE= 320.0 LATITUDE= 39.3 S A 365.00

LAGGING INSTR 14281	5.40	155.52	-35.16	1.78	2.50	45.21
LEADING INSTR 17817	5.95	196.90	11.25	2.49	363.20	43.91
LEADING INSTR 17884	5.82	197.74	12.78	0.77	361.06	44.81
LEADING INSTR 17933	5.81	198.23	12.55	1.04	361.41	45.29
LEADING INSTR 17988	5.45	198.92	14.89	1.70	358.21	46.12

IN-ORBIT ANGLE= 325.0 LATITUDE= 34.4 S A 370.00

LAGGING INSTR 15047	4.70	163.81	-34.10	0.69	-0.95	45.14
LAGGING INSTR 15238	5.53	165.85	-33.44	2.27	-3.22	44.93
LEADING INSTR 17825	6.18	197.06	18.07	1.14	358.47	44.64
LEADING INSTR 17833	4.46	197.11	18.75	1.75	357.54	44.79

IN-ORBIT ANGLE= 330.0 LATITUDE= 29.5 S A 375.00

LAGGING INSTR 15238	5.53	165.85	-33.44	1.26	1.78	44.93
LAGGING INSTR 15350	5.76	167.09	-30.88	2.22	-0.70	42.83
LAGGING INSTR 15398	6.46	167.68	-30.82	2.27	-1.35	42.94
LAGGING INSTR 15523	6.24	168.92	-35.24	2.39	-0.21	47.38
LAGGING INSTR 15530	6.45	169.03	-32.52	1.24	-1.76	44.89
LAGGING INSTR 15641	5.12	170.41	-33.10	2.12	-2.74	45.84
LEADING INSTR 17654	6.12	194.77	19.61	2.39	360.74	42.66
LEADING INSTR 17767	6.04	196.20	22.39	2.00	357.21	44.60
LEADING INSTR 17825	6.18	197.06	18.07	2.47	363.47	44.64
LEADING INSTR 17833	4.46	197.11	18.75	1.80	362.54	44.79
LEADING INSTR 17904	6.48	197.91	19.95	1.07	361.05	45.77
LEADING INSTR 17970	6.29	198.75	21.00	1.77	359.82	46.76

IN-ORBIT ANGLE= 335.0 LATITUDE= 24.6 S A 380.00

LAGGING INSTR 15530	6.45	169.03	-32.52	2.29	3.24	44.89
LAGGING INSTR 15641	5.12	170.41	-33.10	1.82	2.26	45.84
LAGGING INSTR 15680	5.34	170.98	-33.20	1.69	1.80	46.10
LAGGING INSTR 15735	6.49	171.60	-33.94	2.31	1.68	46.96
LAGGING INSTR 15845	3.72	172.86	-29.42	2.35	-2.45	43.40
LAGGING INSTR 15873	6.14	173.23	-30.39	1.62	-2.12	44.38
LAGGING INSTR 15917	5.87	173.75	-31.71	1.40	-1.68	45.72
LAGGING INSTR 15930	6.44	173.86	-30.29	2.01	-2.78	44.54
LAGGING INSTR 16019	4.88	174.65	-32.53	2.24	-1.91	46.77
LEADING INSTR 17767	6.04	196.20	22.39	1.61	362.21	44.60
LEADING INSTR 17769	5.90	196.20	23.85	0.14	360.19	44.95
LEADING INSTR 17877	6.46	197.65	25.48	2.03	358.49	46.72

IN-ORBIT ANGLE= 340.0 LATITUDE= 19.7 S A 385.00

LAGGING INSTR 15845	3.72	172.86	-29.42	2.39	2.55	43.40
LAGGING INSTR 15873	6.14	173.23	-30.39	2.11	2.88	44.38
LAGGING INSTR 15917	5.87	173.75	-31.71	2.47	3.32	45.72
LAGGING INSTR 15930	6.44	173.86	-30.29	1.63	2.22	44.54
LAGGING INSTR 16055	5.31	175.03	-30.78	1.14	1.49	45.42
LAGGING INSTR 16236	5.96	177.52	-28.46	1.87	-2.58	44.57
LAGGING INSTR 16258	4.40	177.82	-31.37	2.10	-0.48	47.07
LEADING INSTR 17787	4.90	196.41	28.86	1.88	358.57	46.57
LEADING INSTR 17796	6.40	196.59	28.79	1.93	358.74	46.71

IN-ORBIT ANGLE= 345.0 LATITUDE= 14.8 S A 390.00

LAGGING INSTR 16236	5.96	177.52	-28.46	1.76	2.42	44.57
LAGGING INSTR 16312	6.12	178.51	-26.80	1.27	0.08	43.73
LEADING INSTR 17455	5.07	192.54	28.79	2.30	361.87	43.10
LEADING INSTR 17647	5.08	194.69	32.03	1.51	358.69	46.19
LEADING INSTR 17764	6.44	196.16	30.26	2.17	361.65	46.82

IN-ORBIT ANGLE= 350.0 LATITUDE= 9.8 S A 395.00

LEADING INSTR 17517	6.26	193.17	34.78	1.15	359.41	46.07

IN-ORBIT ANGLE= 355.0 LATITUDE= 4.9 S A 400.00

LAGGING INSTR 16739	6.42	183.53	-21.93	2.05	0.81	43.02
LAGGING INSTR 16887	5.81	185.42	-22.44	0.45	-0.15	44.57
LAGGING INSTR 17039	5.87	187.15	-21.58	1.71	-2.41	45.17
LAGGING INSTR 17133	2.84	188.18	-21.88	2.26	-2.81	46.04
LEADING INSTR 17231	6.32	189.43	37.22	0.93	359.11	44.32
LEADING INSTR 17430	5.86	192.16	38.77	2.30	359.00	47.18

TOTALS - 252 252 (FOR LAGGING AND LEADING, RESP.)