NASA CR-66530

CASE FILE
COPY

LUNAR ORBITER V

APPENDICES

N68-16225

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Langley Research Center

by

THE BOEING COMPANY

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.

Contract No. NAS1-3800
December 12, 1967

BOEING DOCUMENT D2-100755-6

Contents

Page

Appendix A – Cross Reference of Lunar Photos 1

Appendix B – FPAC Supporting Data 45
Spacecraft Maneuvers 46
Tracking Data Editing 66
TDPX and ODGX Benchmark F-1 69
TDPX Link Decks 86
File Summaries 88
B1 and B2 Save Tape Listings 98
Tracking Data Bar Charts 100
Orbit Determination Results – Cislunar 129
Orbit Determination Results – Lunar Orbit 158
Postflight Photo Evaluation Data 240
Doppler Data – Velocity Maneuvers 249
ODPL Runs Used for Velocity Maneuver Design 259
Summary – Photo Maneuvers and Camera-On Time Recommended by FPAC ... 260
Summary of Command Conference Updates for Mission V Photo Sites 265

Appendix C – Sequence of Events 269

Appendix A

CROSS REFERENCE OF LUNAR PHOTOS

Appendix A
Cross Reference of Lunar Photos

The purpose of this appendix is to provide the reader with a method by which the photographs taken of the lunar surface may be identified with respect to readout periods and to actual photo sites on the lunar surface. As identified in Volume II of this report, the lunar photographs appear in the form of (1) 35-mm film (which is the output of the GRE at each DSIF site), and (2) hand-reassembled prints.

Separate numbers were assigned during the mission for each readout sequence from the spacecraft. This number has been incorporated in the GRE roll number, which also identifies the recording station and spacecraft number. Prior to the flight, edge data numbers were pre-exposed on the spacecraft film. These numbers run in sequence from 0 to 999 and then recycle again. The individual numbers appear at approximately 0.09-inch intervals along the 70-mm spacecraft film. These edge print numbers or framelet numbers are the key to finding a specific framelet read out from the spacecraft within any given photograph or subframe. Each readout sequence from the spacecraft was recorded at a specific DSIF site. Since there are two GRE's at each site, each readout sequence was recorded in two rolls of 35-mm film. The table includes a correlation of the individual framelet numbers with respect to the GRE roll number. It also indicates the GRE roll number of the backup GRE film, which provides identical coverage.

Definition Of Terms

Photo Site – The photo site identification is an alphanumerical symbol, e.g., V-A6a, where the Roman numeral is the mission number, the capital "A" which may or may not be present indicates a farside apolune photo, the Arabic numeral is the site number, and the small letter indicates first or second photo of a convergent stereo pair. As in previous missions, a decimal point in the site number represents a minor change in planned target position.

Spacecraft Exposure Number – The spacecraft exposure number is a sequentially increasing number from 5 through 218, each number is followed by a T or W. Five through 217 are the actual exposure numbers taken. T represents a telephoto exposure; W, a wide-angle exposure. Numbers 1 through 5 were used to place live film in the camera from the supply spool.

Photo Sequence Number ___ of Number ___ – This represents the exposure number within the selected camera mode; i.e.; single-frame mode, four-frame mode, or 8-frame mode.

Recording DSIF Site – Recording DSIF site is the station that accurately received the video signal from the spacecraft during the recording period – Goldstone, California; Woomera, Australia; or Madrid, Spain.

Readout Sequence – The readout sequence is a sequentially increasing number, representing the times that the readout system of the spacecraft was activated by command from the ground. Readout Sequence Numbers 001 and 002 were used to read out and transmit the Goldstone test film that was spliced onto the spacecraft film and read out prior to the actual start of lunar photography. The test film was read out by all three prime stations. Readout periods were divided into two areas. Priority readouts were made during the actual taking of photos. Readout sequences 002P through 087P were assigned to the priority readout area. Readout Sequences 088F through 148F were assigned to the final readout.

GRE Roll Number – The GRE roll number is an eight-digit number that is set into the end of each GRE and recorded outside of the sprocket holes on the 35-mm film. The first two digits identify the GRE by number and by station. The second two digits identify the spacecraft. The next three digits identify the readout sequence number. The last digit identifies transmissions from the spacecraft (0), or test date (1).

Kodak Identification (K.I.) Number – This is a sequentially increasing assigned number given to the roll of GRE film as it is received at East-

man Kodak. The first of the four digits identifies the spacecraft and mission. The remaining three numbers represent the readout sequence in one of the following ways.

- The film used for reassembly and printing carried the actual readout sequence number.
- The KI number of the backup GRE film differs by 500 from that of the primary film.
- In the same manner, when two Deep Space Stations were receiving photo data simultaneously, the secondary station's GRE film numbers differ by 200 from the prime and backup stations (i.e., film numbers 5133 prime, 5333 secondary, 5633 prime backup, and 5833 secondary backup).

Framlet Number – The framelet numbers are the edge data numbers which indicate what portion of each photograph is included on a particular GRE roll.

Remarks – Site names are included opposite the photo site number. In the section labeled "Apollo Sites," the names represent additional photos of earlier missions. (e.g., IP-2 is a repeat of Prime Site 2 originally taken during the first mission).

Arrangement of Data Within Tabulation

The arrangement of subframes and GRE film within the cross reference tables is in the following order.

The first entry of each exposure represents the final readout GRE roll used to make the reassembled negative and defines the complete photo. This is followed by a breakdown of the framelet and subframe numbers, arranged so that the first entry represents the northern edge and the last entry represents the southern edge of the photograph. If a picture is completely covered by one readout sequence, one such entry will be made; however, in many cases two readout sequences were required. In the latter cases, the second readout sequence GRE film completes the area covered by the original photo. The backup GRE film for these subframes is identified on the next lines.

In these areas where portions of the photo were read out in priority readout, they are the next entry in the tabulation and are arranged as described above.

APOLLO SITES

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-3, 1	38T	1-1	Woomera	138F	05 05 138 0	5138	498-400	IP-1
			Goldstone	018P	03 05 018 0	5018	498-437	
			Woomera	018P	06 05 018 0	5218	498-437	
			Woomera	019P	05 05 019 0	5019	436-400	
			Woomera	138F	06 05 138 0	5638		
			Goldstone	018P	04 05 018 0	5518		
			Woomera	018P	05 05 018 0	5718		
			Woomera	019P	06 05 018 0	5519		
	38W	1-1	Woomera	138F	05 05 138 0	5138	659-630	
			Woomera	021P	06 05 021 0	5021	659-630	
			Woomera	138F	06 05 138 0	5638		
			Woomera	021P	05 05 021 0	5521		
V-6	42T	1-1	Woomera	137F	05 05 137 0	5137	022-925	IP-1
			Goldstone	137F	03 05 137 0	5337	022-925	
			Woomera	022P	06 05 022 0	5022	022-925	
			Woomera	137F	06 05 137 0	5637		
			Goldstone	137F	04 05 137 0	5837		
			Woomera	022P	05 05 022 0	5522		
	42W	1-1	Goldstone	136F	03 05 136 0	5136	182-155	
			Woomera	136F	05 05 136 0	5336	182-155	
			Madrid	024P	08 05 024 0	5024	182-155	
			Goldstone	136F	04 05 136 0	5636		
			Woomera	136F	06 05 136 0	5836		
			Madrid	024P	07 05 024 0	5524		
V-8a	44T	1-4	Goldstone	136F	03 05 136 0	5136	284-188	IP-1
			Woomera	136F	05 05 136 0	5336	284-188	
			Madrid	023P	08 05 023 0	5023	284-211	
			Madrid	024P	08 05 024 0	5024	210-188	
			Goldstone	136F	04 05 136 0	5636		
			Woomera	136F	06 05 136 0	5836		
			Madrid	023P	07 05 023 0	5523		
			Madrid	024P	07 05 024 0	5524		
	44W	1-[illegible]	Goldstone	136F	03 05 136 0	5136	446-418	
			Goldstone	136F	04 05 136 0	5636		
	45T	2-4	Goldstone	136F	03 05 136 0	5136	415-319	
			Woomera	136F	05 05 136 0	5336	381-319	
			Goldstone	136F	04 05 136 0	5636		
			Woomera	136F	06 05 136 0	5836		
	45W	2-4	Goldstone	135F	03 05 135 0	5135	577-548	
			Madrid	026P	08 05 026 0	5026	577-548	
			Goldstone	135F	04 05 135 0	5635		
			Madrid	026P	07 05 026 0	5526		
	46T	3-4	Goldstone	135F	03 05 135 0	5135	547-546	
			Goldstone	136F	03 05 136 0	5136	545-451	
			Madrid	026P	08 05 026 0	5026	547-472	
			Goldstone	135F	04 05 135 0	5635		
			Goldstone	136F	04 05 136 0	5636		
			Madrid	026P	07 05 026 0	5526		
	46W	3-4	Goldstone	135F	03 05 135 0	5135	709-681	
			Madrid	025	08 05 025 0	5025	688-681	
			Goldstone	135F	04 05 135 0	5635		
			Madrid	025	07 05 025 0	5525		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-8a	47T	4-4	Goldstone	135F	03 05 135 0	5135	679-583	
			Madrid	025P	08 05 025 0	5025	679-636	
			Madrid	026P	08 05 026 0	5026	635-583	
			Goldstone	135F	04 05 135 0	5635		
			Madrid	025P	07 05 025 0	5525		
			Madrid	026P	07 05 026 0	5526		
	47W	4-4	Goldstone	135F	03 05 135 0	5135	841-813	
			Goldstone	135F	04 05 135 0	5635		
V-8b	48T	1-4	Goldstone	135F	03 05 135 0	5135	811-715	IP-1
			Goldstone	135F	04 05 135 0	5635		
	48W	1-4	Goldstone	135F	03 05 135 0	5135	973-945	
			Goldstone	028P	03 05 028 0	5028	973-945	
			Goldstone	135F	04 05 135 0	5635		
			Goldstone	028P	04 05 028 0	5528		
	49T	2-4	Goldstone	135F	03 05 135 0	5135	941-845	
			Goldstone	028P	03 05 028 0	5028	941-853	
			Goldstone	135F	04 05 135 0	5635		
			Goldstone	028P	04 05 028 0	5528		
	49W	2-4	Goldstone	134F	03 05 134 0	5134	103-074	
			Goldstone	029P	03 05 029 0	5029	103-089	
			Goldstone	027P	03 05 027 0	5027	080-074	
			Madrid	027P	08 05 027 0	5227	080-074	
			Goldstone	134F	04 05 134 0	5634		
			Goldstone	029P	04 05 029 0	5529		
			Goldstone	027P	04 05 027 0	5527		
			Madrid	027P	07 05 027 0	5727		
	50T	3-4	Goldstone	134F	03 05 134 0	5134	073-993	
			Goldstone	135F	03 05 135 0	5135	992-975	
			Goldstone	027P	03 05 027 0	5027	073-050	
			Madrid	027P	08 05 027 0	5227	073-050	
			Goldstone	028P	03 05 028 0	5028	049-975	
			Goldstone	134F	04 05 134 0	5634		
			Goldstone	135F	04 05 135 0	5635		
			Goldstone	027P	04 05 027 0	5527		
			Madrid	027P	07 05 027 0	5727		
			Goldstone	028P	04 05 028 0	5528		
	50W	3-4	Goldstone	134F	03 05 134 0	5134	235-206	
			Goldstone	029P	03 05 029 0	5029	235-206	
			Goldstone	134F	04 05 134 0	5634		
			Goldstone	029P	04 05 029 0	5529		
	51T	4-4	Goldstone	134F	03 05 134 0	5134	203-108	
			Goldstone	029P	03 05 029 0	5029	203-108	
			Goldstone	134F	04 05 134 0	5634		
			Goldstone	029P	04 05 029 0	5529		
	51W	4-4	Goldstone	134F	03 05 134 0	5134	367-339	
			Madrid	134F	08 05 134 0	5334	367-339	
			Goldstone	029P	03 05 029 0	5029	358-339	
			Goldstone	134F	04 05 134 0	5634		
			Madrid	134F	07 05 134 0	5834		
			Goldstone	029P	04 05 029 0	5529		
V-9.1	52T	1-1	Goldstone	134F	03 05 134 0	5134	337-240	
			Madrid	134F	08 05 134 0	5334	337-265	
			Goldstone	029P	03 05 029 0	5029	337-240	

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-9.1	52T	1-1	Goldstone	134F	04 05 134 0	5634		
			Madrid	134F	07 05 134 0	5834		
			Goldstone	029P	04 05 029 0	5529		
	52W	1-1	Madrid	133F	08 05 133 0	5133	496-470	
			Goldstone	133F	03 05 133 0	5333	496-470	
			Goldstone	030P	03 05 030 0	5030	496-470	
			Woomera	030P	05 05 030 0	5230	496-470	
			Madrid	133F	07 05 133 0	5633		
			Goldstone	133F	04 05 133 0	5833		
			Goldstone	030P	04 05 030 0	5530		
			Woomera	030P	06 05 030 0	5730		
V-11a	55T	1-4	Madrid	133F	08 05 133 0	5133	729-633	IIP-2
			Woomera	031P	06 05 031 0	5031	729-667	
			Madrid	133F	07 05 133 0	5633		
			Woomera	031P	05 05 031 0	5531		
	55W	1-4	Madrid	132F	08 05 132 0	5132	890-865	
			Madrid	133F	08 05 133 0	5133	864-862	
			Woomera	033P	06 05 033 0	5033	890-865	
			Woomera	031P	06 05 031 0	5031	869-862	
			Madrid	132F	07 05 132 0	5632		
			Madrid	133F	07 05 133 0	5633		
			Woomera	033P	05 05 033 0	5533		
			Woomera	031P	05 05 031 0	5531		
	56T	2-4	Madrid	133F	08 05 133 0	5133	860-764	
			Woomera	031P	06 05 031 0	5031	860-764	
			Madrid	133F	07 05 133 0	5633		
			Woomera	031P	05 05 031 0	5631		
	56W	2-4	Madrid	132F	08 05 132 0	5132	022-993	
			Woomera	032P	05 05 032 0	5032	022-993	
			Madrid	132F	07 05 132 0	5632		
			Woomera	032P	06 05 032 0	5532		
	57T	3-4	Madrid	132F	08 05 132 0	5132	992-896	
			Woomera	032P	05 05 032 0	5032	992-961	
			Woomera	033P	06 05 033 0	5033	960-896	
			Madrid	132F	07 05 132 0	5632		
			Woomera	032P	06 05 032 0	5532		
			Woomera	033P	05 05 033 0	5533		
	57W	3-4	Madrid	132F	08 05 132 0	5132	155-126	
			Woomera	032P	05 05 032 0	5032	132-126	
			Madrid	132F	07 05 132 0	5632		
			Woomera	032P	06 05 032 0	5533		
	58T	4-4	Madrid	132F	08 05 132 0	5132	124-028	
			Woomera	032P	05 05 032 0	5032	124-028	
			Madrid	132F	07 05 132 0	5632		
			Woomera	032P	06 05 032 0	5532		
	58W	4-4	Madrid	132F	08 05 132 0	5132	285-258	
			Madrid	034P	08 05 034 0	5034	285-258	
			Woomera	034P	06 05 034 0	5234	285-258	
			Madrid	132F	07 05 132 0	5632		
			Madrid	034P	07 05 034 0	5534		
			Woomera	034P	05 05 034 0	5734		
V-11b	59T	1-4	Madrid	132F	08 05 132 0	5132	255-159	
			Madrid	034P	08 05 034 0	5034	255-165	
			Woomera	034P	06 05 034 0	5234	255-177	

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-11b	59T	1-4	Madrid	132F	07 05 132 0	5632		IIP-2
			Madrid	034P	07 05 034 0	5534		
			Woomera	034P	05 05 034 0	5734		
	59W	1-4	Woomera	131F	05 05 131 0	5131	418-390	
			Madrid	131F	08 05 131 0	5331	418-390	
			Woomera	034P	06 05 034 0	5234	396-390	
			Woomera	131F	06 05 131 0	5631		
			Madrid	131F	07 05 131 0	5831		
			Woomera	034P	05 05 034 0	5534		
	60T	2-4	Woomera	131F	05 05 131 0	5131	385-317	
			Madrid	131F	08 05 131 0	5331	385-317	
			Madrid	132F	08 05 132 0	5132	316-289	
			Woomera	034P	06 05 034 0	5234	385-289	
			Madrid	034P	08 05 034 0	5034	329-289	
			Woomera	131F	06 05 131 0	5631		
			Madrid	131F	07 05 131 0	5831		
			Madrid	132F	07 05 132 0	5632		
			Woomera	034P	05 05 034 0	5534		
			Madrid	034P	07 05 034 0	5734		
	60W	2-4	Woomera	131F	05 05 131 0	5131	547-518	
			Woomera	131F	06 05 131 0	5631		
	61T	3-4	Woomera	131F	05 05 131 0	5131	517-421	
			Madrid	131F	08 05 131 0	5331	436-421	
			Woomera	131F	06 05 131 0	5631		
			Madrid	131F	07 05 131 0	5831		
	61W	3-4	Woomera	131F	05 05 131 0	5131	679-650	
			Woomera	131F	06 05 131 0	5631		
	62T	4-4	Woomera	131F	05 05 131 0	5131	648-552	
			Woomera	131F	06 05 131 0	5631		
	62W	4-4	Woomera	130F	05 05 130 0	5130	810-781	
			Madrid	035P	08 05 035 0	5035	810-781	
			Woomera	130F	06 05 130 0	5630		
			Madrid	035P	07 05 035 0	5535		
V-13	64T	1-1	Woomera	130F	05 05 130 0	5130	910-814	IIP-6
			Madrid	035P	08 05 035 0	5035	910-814	
			Woomera	130F	06 05 130 0	5630		
			Madrid	035P	07 05 035 0	5535		
	64W	1-1	Woomera	130F	05 05 130 0	5130	074-043	
			Madrid	037P	08 05 037 0	5037	074-043	
			Woomera	130F	06 05 130 0	5630		
			Madrid	037P	07 05 037 0	5537		
V-16a	71T	1-4	Goldstone	128F	03 05 128 0	5128	829-732	IIP-6
			Woomera	041P	06 05 041 0	5041	829-793	
			Goldstone	128F	04 05 128 0	5628		
			Woomera	041P	05 05 041 0	5541		
	71W	1-4	Goldstone	128F	03 05 128 0	5128	992-963	
			Woomera	041P	06 05 041 0	5041	977-963	
			Goldstone	041P	03 05 041 0	5241	977-963	
			Goldstone	128F	04 05 128 0	5628		
			Woomera	041P	05 05 041 0	5541		
			Goldstone	041P	04 05 041 0	5741		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-16a	72T	2-4	Goldstone	128F	03 05 128 0	5128	961-863	
			Woomera	041P	06 05 041 0	5041	961-861	
			Goldstone	041P	03 05 041 0	5241	961-861	
			Goldstone	128F	04 05 128 0	5628		
			Woomera	041P	05 05 041 0	5541		
			Goldstone	041P	04 05 041 0	5741		
	72W	2-4	Goldstone	127F	03 05 127 0	5127	123-119	
			Goldstone	128F	03 05 128 0	5128	118-093	
			Goldstone	127F	04 05 127 0	5627		
			Goldstone	128F	04 05 128 0	5628		
	73T	3-4	Goldstone	128F	03 05 128 0	5128	092-996	
			Goldstone	128F	04 05 128 0	5628		
	73W	3-4	Goldstone	127F	03 05 127 0	5127	254-225	
			Goldstone	127F	04 05 127 0	5627		
	74T	4-4	Goldstone	127F	03 05 127 0	5127	224-128	
			Goldstone	127F	04 05 127 0	5627		
	74W	4-4	Goldstone	127F	03 05 127 0	5127	386-356	
			Woomera	042P	06 05 042 0	5042	368-357	
			Goldstone	127F	04 05 127 0	5627		
			Woomera	042P	05 05 042 0	5542		
V-16b	75T	1-4	Goldstone	127F	03 05 127 0	5127	355-259	IIP-6
			Woomera	042P	06 05 042 0	5042	355-269	
			Goldstone	127F	04 05 127 0	5627		
			Woomera	042P	05 05 042 0	5542		
	75W	1-4	Goldstone	127F	03 05 127 0	5127	517-489	
			Goldstone	127F	04 05 127 0	5627		
	76T	2-4	Goldstone	127F	03 05 127 0	5127	486-390	
			Goldstone	127F	04 05 127 0	5627		
	76W	2-4	Goldstone	126F	03 05 126 0	5126	648-619	
			Goldstone	126F	04 05 126 0	5626		
	77T	3-4	Goldstone	126F	03 05 126 0	5126	618-575	
			Goldstone	127F	03 05 127 0	5127	574-520	
			Goldstone	126F	04 05 126 0	5626		
			Goldstone	127F	04 05 127 0	5627		
	77W	3-4	Goldstone	126F	03 05 126 0	5126	780-751	
			Madrid	126F	08 05 126 0	5326	780-751	
			Woomera	043P	05 05 043 0	5043	780-751	
			Goldstone	126F	04 05 126 0	5626		
			Madrid	126F	07 05 126 0	5826		
			Woomera	043P	06 05 043 0	5543		
	78T	4-4	Goldstone	126F	03 05 126 0	5126	748-652	
			Madrid	126F	08 05 126 0	5326	748-706	
			Woomera	043P	05 05 043 0	5043	748-713	
			Goldstone	126F	04 05 126 0	5626		
			Madrid	126F	07 05 126 0	5826		
			Woomera	043P	06 05 043 0	5543		
	78W	4-4	Goldstone	126F	03 05 126 0	5126	911-883	
			Madrid	126F	08 05 126 0	5326	911-883	
			Woomera	043P	05 05 043 0	5043	911-883	
			Goldstone	126F	04 05 126 0	5626		
			Madrid	126F	07 05 126 0	5826		
			Woomera	043P	06 05 043 0	5543		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-27a	108T	1-4	Madrid	118F	08 05 118 0	5118	687-592	IIP-8
			Madrid	055P	08 05 055 0	5055	687-610	
			Madrid	118F	07 05 118 0	5618		
			Madrid	055P	07 05 055 0	5155		
	108W	1-4	Madrid	118F	08 05 118 0	5118	850-821	
			Madrid	118F	07 05 118 0	5618		
	109T	2-4	Madrid	118F	08 05 118 0	5118	817-721	
			Madrid	054P	08 05 054 0	5054	817-782	
			Madrid	055P	08 05 055 0	5055	781-721	
			Madrid	118F	07 05 118 0	5618		
			Madrid	054P	07 05 054 0	5554		
			Madrid	055P	07 05 055 0	5555		
	109W	2-4	Madrid	118F	08 05 118 0	5118	979-951	
			Madrid	118F	07 05 118 0	5618		
	110T	3-4	Madrid	118F	08 05 118 0	5118	950-853	
			Madrid	118F	07 05 118 0	5618		
	110W	3-4	Madrid	117F	08 05 117 0	5117	112-083	
			Madrid	057P	08 05 057 0	5057	112-083	
			Goldstone	057P	03 05 057 0	5257	112-083	
			Madrid	117F	07 05 117 0	5617		
			Madrid	057P	07 05 057 0	5557		
			Goldstone	057P	04 05 057 0	5757		
	111T	4-4	Madrid	117F	08 05 117 0	5117	081-993	
			Madrid	118F	08 05 118 0	5118	992-985	
			Madrid	057P	08 05 057 0	5057	081-027	
			Goldstone	057P	03 05 057 0	5257	081-027	
			Goldstone	058P	03 05 058 0	5058	026-014	
			Madrid	117F	07 05 117 0	5617		
			Madrid	118F	07 05 118 0	5618		
			Madrid	057P	07 05 057 0	5557		
			Goldstone	057P	04 05 057 0	5757		
			Goldstone	058P	04 05 058 0	5558		
	111W	4-4	Madrid	117F	08 05 117 0	5117	244-215	
			Madrid	117F	07 05 117 0	5617		
V-27b	112T	1-4	Madrid	117F	08 05 117 0	5117	213-117	IIP-8
			Madrid	056P	08 05 056 0	5056	210-159	
			Madrid	057P	08 05 057 0	5057	158-117	
			Goldstone	057P	03 05 057 0	5257	146-117	
			Madrid	117F	07 05 117 0	5617		
			Madrid	056P	07 05 056 0	5556		
			Madrid	057P	07 05 057 0	5557		
			Goldstone	057P	04 05 057 0	5757		
	112W	1-4	Madrid	117F	08 05 117 0	5117	375-347	
			Madrid	117F	07 05 117 0	5617		
	113T	2-4	Madrid	117F	08 05 117 0	5117	343-247	
			Madrid	117F	07 05 117 0	5617		
	113W	2-4	Woomera	116F	06 05 116 0	5116	505-494	
			Madrid	117F	08 05 117 0	5117	493-477	
			Woomera	116F	05 05 116 0	5616		
			Madrid	117F	07 05 117 0	5617		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-27b	114T	3-4	Madrid	117F	08 05 117 0	5117	475-379	
			Madrid	117F	07 05 117 0	5617		
	114W	3-4	Woomera	116F	06 05 116 0	5116	637-608	
			Goldstone	060P	03 05 060 0	5060	637-608	
			Woomera	116F	05 05 116 0	5616		
			Goldstone	060P	04 05 060 0	5560		
	115T	4-4	Woomera	116F	06 05 116 0	5116	607-511	
			Goldstone	060P	03 05 060 0	5060	607-515	
			Woomera	116F	05 05 116 0	5616		
			Goldstone	060P	04 05 060 0	5560		
	115W	4-4	Woomera	116F	06 05 116 0	5116	769-740	
			Goldstone	059P	03 05 059 0	5059	753-740	
			Woomera	116F	05 05 116 0	5616		
			Goldstone	059P	04 05 059 0	5559		
V-42a	169T	1-4	Madrid	101F	08 05 101 0	5101	694-603	IIIP-11
			Madrid	102F	08 05 102 0	5102	602-598	
			Goldstone	081P	03 05 081 0	5081	681-598	
			Madrid	101F	07 05 101 0	5601		
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	169W	1-4	Madrid	101F	08 05 101 0	5101	857-826	
			Woomera	082P	06 05 082 0	5082	857-826	
			Goldstone	082P	03 05 082 0	5282	857-826	
			Madrid	101F	07 05 101 0	5601		
			Woomera	082P	05 05 082 0	5582		
			Goldstone	082P	04 05 082 0	5782		
	170T	2-4	Madrid	101F	08 05 101 0	5101	824-728	
			Woomera	082P	06 05 082 0	5082	824-735	
			Madrid	101F	07 05 101 0	5601		
			Woomera	082P	05 05 082 0	5582		
	170W	2-4	Madrid	101F	08 05 101 0	5101	987-958	
			Woomera	082P	06 05 082 0	5082	987-958	
			Goldstone	082P	03 05 082 0	5282	987-958	
			Madrid	101F	07 05 101 0	5601		
			Woomera	082P	05 05 082 0	5582		
			Goldstone	082P	04 05 082 0	5782		
	171T	3-4	Madrid	101F	08 05 101 0	5101	957-861	
			Woomera	082P	06 05 082 0	5082	957-861	
			Goldstone	082P	03 05 082 0	5282	957-861	
			Madrid	101F	07 05 101 0	5601		
			Woomera	082P	05 05 082 0	5582		
			Goldstone	082P	04 05 082 0	5782		
	171W	3-4	Madrid	101F	08 05 101 0	5101	119-090	
			Madrid	101F	07 05 101 0	5601		
	172T	4-4	Madrid	101F	08 05 101 0	5101	089-993	
			Woomera	082P	05 05 082 0	5082	080-993	
			Goldstone	082P	03 05 082 0	5282	080-993	
			Madrid	101F	07 05 101 0	5601		
			Woomera	082P	06 05 082 0	5582		
			Goldstone	082P	04 05 082 0	5782		
	172W	4-4	Woomera	100F	05 05 100 0	5100	251-223	
			Woomera	100F	06 05 100 0	5600		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-42b	173T	1-4	Woomera	100F	05 05 100 0	5100	221-128	IIIP-11
			Madrid	101F	08 05 101 0	5101	127-125	
			Madrid	100F	08 05 100 0	5300	221-128	
			Woomera	100F	06 05 100 0	5600		
			Madrid	101F	07 05 101 0	5601		
			Madrid	100F	07 05 100 0	5800		
	173W	1-4	Woomera	100F	05 05 100 0	5100	383-354	
			Woomera	100F	06 05 100 0	5600		
	174T	2-4	Woomera	100F	05 05 100 0	5100	351-255	
			Woomera	100F	06 05 100 0	5600		
	174W	2-4	Woomera	100F	05 05 100 0	5100	513-484	
			Woomera	083P	05 05 083 0	5083	513-484	
			Woomera	100F	06 05 100 0	5600		
			Woomera	083P	06 05 083 0	5583		
	175T	3-4	Woomera	100F	05 05 100 0	5100	482-385	
			Woomera	083P	05 05 083 0	5083	482-465	
			Woomera	100F	06 05 100 0	5600		
			Woomera	083P	06 05 083 0	5583		
	175W	3-4	Woomera	099F	05 05 099 0	5099	644-615	
			Woomera	083P	05 05 083 0	5083	644-615	
			Woomera	099F	06 05 099 0	5599		
			Woomera	083P	06 05 083 0	5583		
	176T	4-4	Woomera	100F	05 05 100 0	5100	613-517	
			Woomera	083P	05 05 083 0	5083	613-517	
			Woomera	100F	06 05 100 0	5600		
			Woomera	083P	06 05 083 0	5583		
	176W	4-4	Woomera	099F	05 05 099 0	5099	775-746	
			Woomera	083P	05 05 083 0	5083	775-746	
			Woomera	099F	06 05 099 0	5599		
			Woomera	083P	06 05 083 0	5583		

SCIENCE AND AAP SITES

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-1	33T	1-4	Madrid	139F	08 05 139 0	5139	840-815	Petavius
			Madrid	140F	08 05 140 0	5140	814-744	
			Goldstone	016P	03 05 016 0	5016	840-744	
			Madrid	139F	07 05 139 0	5639		
			Madrid	140F	07 05 140 0	5640		
			Goldstone	016P	04 05 016 0	5516		
	33W	1-4	Madrid	139F	08 05 139 0	5139	002-974	
			Goldstone	016P	03 05 016 0	5016	987-974	
			Madrid	139F	07 05 139 0	5639		
			Goldstone	016P	04 05 016 0	5516		
	34T	2-4	Madrid	139F	08 05 139 0	5139	972-876	
			Goldstone	016P	03 05 016 0	5016	972-876	
			Madrid	139F	07 05 139 0	5639		
			Goldstone	016P	04 05 016 0	5516		
	34W	2-4	Madrid	139F	08 05 139 0	5139	134-105	
			Goldstone	017P	03 05 017 0	5017	134-105	
			Woomera	017P	06 05 017 0	5217	134-105	
			Madrid	139F	07 05 139 0	5639		
			Goldstone	017P	04 05 017 0	5517		
			Woomera	017P	05 05 017 0	5717		
	35T	3-4	Madrid	139F	08 05 139 0	5139	104-007	
			Goldstone	017P	03 05 017 0	5017	104-070	
			Woomera	017P	06 05 017 0	5217	104-070	
			Madrid	139F	07 05 139 0	5639		
			Goldstone	017P	04 05 017 0	5517		
			Woomera	017P	05 05 017 0	5717		
	35W	3-4	Woomera	138F	05 05 138 0	5138	266-249	
			Madrid	139F	08 05 139 0	5139	248-238	
			Goldstone	017P	03 05 017 0	5017	250-238	
			Woomera	138F	06 05 138 0	5638		
			Madrid	139F	07 05 139 0	5639		
			Goldstone	017P	04 05 017 0	5517		
	36T	4-4	Madrid	139F	08 05 139 0	5139	236-139	
			Goldstone	017P	03 05 017 0	5017	236-139	
			Woomera	017P	06 05 017 0	5217	215-139	
			Madrid	139F	07 05 139 0	5639		
			Goldstone	017P	04 05 017 0	5517		
			Woomera	017P	05 05 019 0	5717		
	36W	4-4	Woomera	138F	05 05 138 0	5138	398-369	
			Woomera	019P	05 05 019 0	5019	398-369	
			Woomera	138F	06 05 138 0	5638		
			Woomera	019P	06 05 019 0	5519		
V-2.1	37T	1-1	Woomera	138F	05 05 138 0	5138	367-271	Petavius B
			Woomera	019P	05 05 019 0	5019	367-271	
			Woomera	138F	06 05 138 0	5638		
			Woomera	019P	06 05 019 0	5519		
	37W	1-1	Woomera	138F	05 05 138 0	5138	529-500	
			Woomera	021P	06 05 021 0	5021	529-527	
			Goldstone	018P	03 05 018 0	5018	508-500	
			Woomera	018P	05 05 018 0	5218	508-500	
			Woomera	138F	06 05 138 0	5638		
			Woomera	021P	05 05 021 0	5521		
			Goldstone	018P	04 05 018 0	5518		
			Woomera	018P	06 05 018 0	5718		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. __ OF __	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-4	40T	1-1	Woomera	137F	05 05 137 0	5137	759-692	Stevinus A
			Woomera	138F	05 05 138 0	5138	691-663	
			Woomera	020P	06 05 020 0	5020	759-696	
			Woomera	021P	06 05 021 0	5021	695-663	
			Woomera	137F	06 05 137 0	5637		
			Woomera	138F	06 05 138 0	5638		
			Woomera	020P	05 05 020 0	5520		
			Woomera	021P	05 05 021 0	5521		
	40W	1-1	Woomera	137F	05 05 137 0	5137	921-893	
			Goldstone	137F	03 05 137 0	5337	922-907	
			Woomera	022P	06 05 022 0	5022	922-893	
			Woomera	137F	06 05 137 0	5637		
			Goldstone	137F	04 05 137 0	5837		
			Woomera	022P	05 05 022 0	5522		
V-5.1	41T	1-1	Woomera	137F	05 05 137 0	5137	890-794	Messier
			Woomera	022P	06 05 022 0	5022	890-885	
			Woomera	137F	06 05 137 0	5637		
			Woomera	022P	05 05 022 0	5522		
	41W	1-1	Woomera	137F	05 05 137 0	5137	051-024	
			Goldstone	137F	03 05 137 0	5337	051-024	
			Woomera	022P	06 05 022 0	5022	035-024	
			Woomera	137F	06 05 137 0	5637		
			Goldstone	137F	04 05 137 0	5837		
			Woomera	022P	05 05 022 0	5522		
V-10	54T	1-1	Madrid	133F	08 05 133 0	5133	597-501	Altai Scarp
			Goldstone	133F	03 05 133 0	5333	524-501	
			Goldstone	030P	03 05 030 0	5030	597-501	
			Woomera	030P	05 05 030 0	5230	597-501	
			Madrid	133F	07 05 133 0	5633		
			Goldstone	133F	04 05 133 0	5833		
			Goldstone	030P	03 05 030 0	5530		
			Woomera	030P	06 05 030 0	5730		
	54W	1-1	Madrid	133F	08 05 133 0	5133	759-730	
			Woomera	031P	06 05 031 0	5031	759-730	
			Madrid	133F	07 05 133 0	5633		
			Woomera	031P	05 05 031 0	5531		
V-12	63T	1-1	Woomera	130F	05 05 130 0	5130	780-757	Censorinus
			Woomera	131F	05 05 131 0	5131	756-685	
			Madrid	035P	08 05 035 0	5035	780-773	
			Woomera	130F	06 05 130 0	5630		
			Woomera	131F	06 05 131 0	5631		
			Madrid	035P	07 05 035 0	5535		
	63W	1-1	Woomera	130F	05 05 130 0	5130	943-914	
			Madrid	035P	08 05 035 0	5035	915-914	
			Woomera	130F	06 05 130 0	5630		
			Madrid	035P	07 05 035 0	5535		
V-14	66T	1-1	Woomera	130F	05 05 130 0	5130	173-077	Littrow
			Madrid	036P	07 05 036 0	5036	173-119	
			Madrid	037P	08 05 037 0	5037	118-077	
			Woomera	130F	06 05 130 0	5630		
			Madrid	036P	08 05 036 0	5536		
			Madrid	037P	07 05 037 0	5537		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-14	66W	1-4	Woomera	129F	05 05 129 0	5129	334-307	
			Goldstone	129F	03 05 129 0	5329	334-307	
			Goldstone	039P	03 05 039 0	5039	334-307	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	039P	04 05 039 0	5539		
	67T	2-4	Woomera	129F	05 05 129 0	5129	304-214	
			Goldstone	129F	03 05 129 0	5329	301-214	
			Woomera	130F	05 05 130 0	5130	212-208	
			Goldstone	039P	03 05 039 0	5039	304-265	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Woomera	130F	06 05 130 0	5630		
			Goldstone	039P	04 05 039 0	5539		
	67W	2-4	Woomera	129F	05 05 129 0	5129	466-437	
			Goldstone	129F	03 05 129 0	5329	466-437	
			Goldstone	038P	03 05 038 0	5038	466-437	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	038P	04 05 038 0	5538		
	68T	3-4	Woomera	129F	05 05 129 0	5129	436-340	
			Goldstone	129F	03 05 129 0	5329	436-340	
			Goldstone	038P	03 05 038 0	5038	436-410	
			Goldstone	039P	03 05 039 0	5039	409-340	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	038P	04 05 038 0	5538		
			Goldstone	039P	04 05 039 0	5539		
	68W	3-4	Woomera	129F	05 05 129 0	5129	597-570	
			Goldstone	129F	03 05 129 0	5329	597-570	
			Goldstone	040P	03 05 040 0	5040	597-570	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	040P	04 05 040 0	5540		
	69T	4-4	Woomera	129F	05 05 129 0	5129	567-471	
			Goldstone	129F	03 05 129 0	5329	567-471	
			Goldstone	040P	03 05 040 0	5040	567-527	
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	040P	04 05 040 0	5540		
	69W	4-4	Goldstone	128F	03 05 128 0	5128	729-700	
			Goldstone	040P	03 05 040 0	5040	716-700	
			Goldstone	128F	04 05 128 0	5628		
			Goldstone	040P	04 05 040 0	5540		
V-15.1	70T	1-1	Goldstone	128F	03 05 128 0	5128	699-665	Dawes
			Woomera	129F	05 05 129 0	5129	664-603	
			Goldstone	129F	03 05 129 0	5329	664-603	
			Goldstone	040P	03 05 040 0	5040	699-603	
			Goldstone	128F	04 05 128 0	5628		
			Woomera	129F	06 05 129 0	5629		
			Goldstone	129F	04 05 129 0	5829		
			Goldstone	040P	04 05 040 0	5540		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-15.1	70W	1-1	Goldstone	128F	03 05 128 0	5128	560-532	
			Woomera	041P	06 05 041 0	5041	560-532	
			Goldstone	041P	03 05 041 0	5241	560-543	
			Goldstone	128F	04 05 128 0	5628		
			Woomera	041P	05 05 041 0	5541		
			Goldstone	041P	04 05 041 0	5741		
V-18	80T	1-4	Goldstone	126F	03 05 126 0	5126	010-914	Dionysius
			Madrid	126F	08 05 126 0	5326	010-914	
			Goldstone	126F	04 05 126 0	5626		
			Madrid	126F	07 05 126 0	5526		
	80W	1-4	Madrid	125F	08 05 125 0	5125	172-144	
			Madrid	044P	08 05 044 0	5044	155-144	
			Madrid	125F	07 05 125 0	5625		
			Madrid	044P	07 05 044 0	5544		
	81T	2-4	Madrid	125F	08 05 125 0	5125	141-045	
			Madrid	044P	08 05 044 0	5044	141-045	
			Madrid	125F	07 05 125 0	5625		
			Madrid	044P	07 05 044 0	5544		
	81W	2-4	Madrid	125F	08 05 125 0	5125	303-274	
			Madrid	045P	08 05 045 0	5045	303-274	
			Madrid	125F	07 05 125 0	5625		
			Madrid	045P	07 05 045 0	5545		
	82T	3-4	Madrid	125F	08 05 125 0	5125	274-177	
			Madrid	125F	07 05 125 0	5625		
	82W	3-4	Madrid	125F	08 05 125 0	5125	436-407	
			Madrid	045P	08 05 045 0	5045	425-407	
			Madrid	125F	07 05 125 0	5625		
			Madrid	045P	07 05 045 0	5545		
	83T	4-4	Madrid	125F	08 05 125 0	5125	405-309	
			Madrid	045P	08 05 045 0	5045	405-309	
			Madrid	125F	07 05 125 0	5625		
			Madrid	045P	07 05 045 0	5545		
	83W	4-4	Madrid	124F	08 05 124 0	5124	567-538	
			Madrid	124F	07 05 124 0	5624		
V-19	84T	1-1	Madrid	124F	08 05 124 0	5124	567-485	Abulfeda
			Madrid	125F	08 05 125 0	5125	484-440	
			Madrid	124F	07 05 124 0	5624		
			Madrid	125F	07 05 125 0	5625		
	84W	1-1	Madrid	124F	08 05 124 0	5124	699-670	
			Madrid	124F	07 05 124 0	5624		
V-21	86T	1-4	Madrid	124F	08 05 124 0	5124	798-702	South of Alexander
			Madrid	046P	07 05 046 0	5046	798-788	
			Goldstone	046P	03 05 046 0	5246	798-788	
			Madrid	124F	07 05 124 0	5624		
			Madrid	046P	08 05 046 0	5546		
			Goldstone	046P	04 05 046 0	5746		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-21	86W	1-4	Woomera	123F	05 05 123 0	5123	960-955	
			Madrid	123F	08 05 123 0	5323	960-955	
			Madrid	124F	08 05 124 0	5124	954-931	
			Madrid	046P	07 05 046 0	5046	960-931	
			Woomera	123F	06 05 123 0	5623		
			Madrid	123F	07 05 123 0	5823		
			Madrid	124F	07 05 124 0	5624		
			Madrid	046P	08 05 046 0	5546		
	87T	2-4	Madrid	124F	08 05 124 0	5124	929-833	
			Madrid	046P	07 05 046 0	5046	929-833	
			Goldstone	046P	03 05 046 0	5246	864-833	
			Madrid	124F	07 05 124 0	5624		
			Madrid	046P	08 05 046 0	5546		
			Goldstone	046P	04 05 046 0	5746		
	87W	2-4	Woomera	123F	05 05 123 0	5123	091-063	
			Madrid	123F	08 05 123 0	5323	091-063	
			Woomera	123F	06 05 123 0	5623		
			Madrid	123F	07 05 123 0	5823		
	88T	3-4	Woomera	123F	05 05 123 0	5123	061-965	
			Madrid	123F	08 05 123 0	5323	061-965	
			Woomera	123F	06 05 123 0	5623		
			Madrid	123F	07 05 123 0	5823		
	88W	3-4	Woomera	123F	05 05 123 0	5123	223-195	
			Woomera	123F	06 05 123 0	5623		
	89T	4-4	Woomera	123F	05 05 123 0	5123	193-097	
			Madrid	123F	08 05 123 0	5323	112-097	
			Woomera	123F	06 05 123 0	5623		
			Madrid	123F	07 05 123 0	5823		
	89W	4-4	Woomera	123F	05 05 123 0	5123	355-326	
			Goldstone	047P	03 05 047 0	5047	355-326	
			Woomera	123F	06 05 123 0	5623		
			Goldstone	047P	04 05 047 0	5547		
V-22	90T	1-4	Woomera	123F	05 05 123 0	5123	325-229	Sulpicious Gallas
			Goldstone	047P	03 05 047 0	5047	326-311	Rilles
			Woomera	123F	06 05 123 0	5623		
			Goldstone	047P	04 05 047 0	5547		
	90W	1-4	Woomera	122F	05 05 122 0	5122	487-459	
			Woomera	122F	06 05 122 0	5622		
	91T	2-4	Woomera	122F	05 05 122 0	5122	454-433	
			Woomera	123F	05 05 123 0	5123	432-358	
			Woomera	122F	06 05 122 0	5622		
			Woomera	123F	06 05 123 0	5623		
	91W	2-4	Woomera	122F	05 05 122 0	5122	616-587	
			Woomera	122F	06 05 122 0	5622		
	92T	3-4	Woomera	122F	05 05 122 0	5122	586-490	
			Woomera	122F	06 05 122 0	5622		
	92W	3-4	Woomera	122F	05 05 122 0	5122	748-719	
			Goldstone	048P	03 05 048 0	5048	742-719	
			Woomera	048P	05 05 048 0	5248	742-719	
			Woomera	122F	06 05 122 0	5622		
			Goldstone	048P	01 05 048 0	5548		
			Woomera	048P	06 05 048 0	5748		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-22	93T	4-4	Woomera	122F	05 05 122 0	5128	717-621	
			Goldstone	048P	03 05 048 0	5048	718-640	
			Woomera	048P	05 05 048 0	5248	718-640	
			Woomera	122F	06 05 122 0	5628		
			Goldstone	048P	04 05 048 0	5548		
			Woomera	048P	06 05 048 0	5748		
	93W	4-4	Woomera	122F	05 05 122 0	5122	879-851	
			Woomera	122F	06 05 122 0	5622		
V-23.2	94T	1-4	Woomera	122F	05 05 122 0	5122	850-754	Hyginus Rilles
			Woomera	122F	06 05 122 0	5622		
	94W	1-4	Goldstone	121F	03 05 121 0	5121	012-983	
			Woomera	121F	05 05 121 0	5321	012-983	
			Woomera	049P	06 05 049 0	5049	012-983	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	049P	05 05 049 0	5549		
	95T	2-4	Goldstone	121F	03 05 121 0	5121	979-898	
			Woomera	121F	05 05 121 0	5321	979-898	
			Woomera	122F	05 05 122 0	5122	897-883	
			Woomera	049P	06 05 049 0	5049	979-958	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	122F	06 05 122 0	5622		
			Woomera	049P	05 05 049 0	5549		
	95W	2-4	Goldstone	121F	03 05 121 0	5121	141-112	
			Woomera	121F	05 05 121 0	5321	141-112	
			Woomera	049P	06 05 049 0	5049	138-112	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	049P	05 05 049 0	5549		
	96T	3-4	Goldstone	121F	03 05 121 0	5121	112-016	
			Woomera	121F	05 05 121 0	5321	112-016	
			Woomera	049P	06 05 049 0	5049	112-016	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	049P	05 05 049 0	5549		
	96W	3-4	Goldstone	121F	03 05 121 0	5121	274-246	
			Woomera	121F	05 05 121 0	5321	274-246	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
	97T	4-4	Goldstone	121F	03 05 121 0	5121	242-146	
			Woomera	121F	05 05 121 0	5321	242-146	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
	97W	4-4	Goldstone	121F	03 05 121 0	5121	405-377	
			Woomera	121F	05 05 121 0	5321	405-377	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-24	98T	1-4	Goldstone	121F	03 05 121 0	5121	376-279	Hipparchus
			Woomera	121F	05 05 121 0	5321	376-279	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
	98W	1-4	Goldstone	121F	03 05 121 0	5121	536-509	
			Woomera	121F	05 05 121 0	5321	537-509	
			Woomera	050P	05 05 050 0	5050	537-509	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	050P	06 05 050 0	5550		
	99T	2-4	Goldstone	121F	03 05 121 0	5121	505-408	
			Woomera	121F	05 05 121 0	5321	505-408	
			Woomera	050P	05 05 050 0	5050	505-415	
			Goldstone	121F	04 05 121 0	5621		
			Woomera	121F	06 05 121 0	5821		
			Woomera	050P	06 05 050 0	5550		
	99W	2-4	Goldstone	120F	03 05 120 0	5120	666-638	
			Woomera	050P	05 05 050 0	5050	662-638	
			Goldstone	120F	04 05 120 0	5620		
			Woomera	050P	06 05 050 0	5550		
	100T	3-4	Goldstone	120F	03 05 120 0	5120	637-540	
			Woomera	050P	05 05 050 0	5050	637-540	
			Goldstone	120F	04 05 120 0	5620		
			Woomera	050P	06 05 050 0	5550		
	100W	3-4	Goldstone	120F	03 05 120 0	5120	798-770	
			Woomera	051P	06 05 051 0	5051	798-788	
			Goldstone	120F	04 05 120 0	5620		
			Woomera	051P	05 05 120 0	5551		
	101T	1-4	Goldstone	120F	03 05 120 0	5120	769-673	
			Goldstone	120F	04 05 120 0	5620		
	101W	1-4	Goldstone	120F	03 05 120 0	5120	931-903	
			Madrid	120F	08 05 120 0	5820	931-903	
			Woomera	051P	06 05 051 0	5051	931-903	
			Goldstone	120F	04 05 120 0	5620		
			Madrid	120F	07 05 120 0	5820		
			Woomera	051P	05 05 051 0	5551		
V-25	102T	1-1	Goldstone	120F	03 05 120 0	5120	901-805	Alpine Valley
			Woomera	051P	06 05 051 0	5051	901-805	
			Goldstone	120F	04 05 120 0	5620		
			Woomera	051P	05 05 051 0	5951		
	102W	1-1	Madrid	119F	08 05 119 0	5119	063-034	
			Goldstone	119F	03 05 119 0	5319	063-034	
			Madrid	119F	07 05 119 0	5619		
			Goldstone	119F	04 05 119 0	5819		
V-26.1	104T	1-4	Madrid	119F	08 05 119 0	5119	160-064	Hadley Rille
			Goldstone	119F	03 05 119 0	5319	160-064	
			Madrid	119F	07 05 119 0	5619		
			Goldstone	119F	04 05 119 0	5819		
	104W	1-4	Madrid	119F	08 05 119 0	5119	322-294	
			Goldstone	119F	03 05 119 0	5319	322-294	
			Madrid	053P	08 05 053 0	5053	322-294	
			Madrid	119F	07 05 119 0	5619		
			Goldstone	119F	04 05 119 0	5819		
			Madrid	053P	07 05 053 0	5553		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-26.1	105T	2-4	Madrid	119F	08 05 119 0	5119	292-196	
			Goldstone	119F	03 05 119 0	5319	292-196	
			Madrid	053P	08 05 053 0	5053	292-213	
			Madrid	119F	07 05 119 0	5619		
			Goldstone	119F	04 05 119 0	5819		
			Madrid	053P	07 05 053 0	5553		
	105W	2-4	Madrid	119F	08 05 119 0	5119	454-425	
			Woomera	052P	05 05 052 0	5052	426-425	
			Madrid	119F	07 05 119 0	5619		
			Woomera	052P	06 05 052 0	5552		
	106T	3-4	Madrid	119F	08 05 119 0	5119	423-328	
			Goldstone	119F	03 05 119 0	5319	391-328	
			Woomera	052P	05 05 052 0	5052	423-369	
			Madrid	053P	08 05 053 0	5053	376-328	
			Madrid	119F	07 05 119 0	5619		
			Goldstone	119F	04 05 119 0	5819		
			Woomera	052P	06 05 052 0	5552		
			Madrid	053P	07 05 053 0	5553		
	106W	3-4	Madrid	118F	08 05 118 0	5118	586-557	
			Madrid	118F	07 05 118 0	5618		
	107T	4-4	Madrid	118F	08 05 118 0	5118	556-501	
			Madrid	119F	08 05 119 0	5119	500-460	
			Madrid	118F	07 05 118 0	5618		
			Madrid	119F	07 05 119 0	5619		
	107W	4-4	Madrid	118F	08 05 118 0	5118	718-690	
			Madrid	055P	08 05 055 0	5055	718-690	
			Madrid	118F	07 05 118 0	5618		
			Madrid	055P	07 05 055 0	5555		
V-28	116T	1-4	Woomera	116F	06 05 116 0	5116	738-642	Alphonsus
			Goldstone	059P	03 05 059 0	5059	738-705	
			Goldstone	060P	03 05 060 0	5060	701-642	
			Woomera	116F	05 05 116 0	5616		
			Goldstone	059P	04 05 059 0	5559		
			Goldstone	060P	04 05 060 0	5560		
	116W	1-4	Woomera	116F	06 05 116 0	5116	900-872	
			Woomera	116F	05 05 116 0	5616		
	117T	2-4	Woomera	116F	06 05 116 0	5116	868-771	
			Woomera	116F	05 05 116 0	5616		
	117W	2-4	Woomera	115F	06 05 115 0	5115	030-002	
			Goldstone	062P	03 05 062 0	5062	030-007	
			Woomera	062P	05 05 062 0	5262	030-007	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	062P	04 05 062 0	5562		
			Woomera	062P	06 05 062 0	5762		
	118T	3-4	Woomera	115F	06 05 115 0	5115	999-981	
			Woomera	116F	05 05 116 0	5116	980-903	
			Woomera	115F	05 05 115 0	5615		
			Woomera	116F	05 05 116 0	5616		
	118W	3-4	Woomera	115F	06 05 115 0	5115	162-133	
			Goldstone	061P	03 05 061 0	5061	162-133	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	061P	04 05 061 0	5561		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. __ OF __	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-28	119T	4-4	Woomera	115F	06 05 115 0	5115	131-035	
			Goldstone	061P	03 05 061 0	5061	131-092	
			Goldstone	062P	03 05 062 0	5062	091-035	
			Woomera	062P	05 05 062 0	5262	091-035	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	061P	04 05 061 0	5561		
			Goldstone	062P	04 05 062 0	5562		
			Woomera	062P	06 05 062 0	5762		
	119W	4-4	Woomera	115F	06 05 115 0	5115	293-264	
			Goldstone	061P	03 05 061 0	5061	293-264	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	061P	04 05 061 0	5561		
V-29	120T	1-4	Woomera	115F	06 05 115 0	5115	264-167	Rima Bode II
			Goldstone	061P	03 05 061 0	5061	264-167	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	061P	04 05 061 0	5561		
	120W	1-4	Woomera	115F	06 05 115 0	5115	425-397	
			Woomera	115F	05 05 115 0	5615		
	121T	2-4	Woomera	115F	06 05 115 0	5115	395-297	
			Goldstone	061P	03 05 061 0	5061	329-297	
			Woomera	115F	05 05 115 0	5615		
			Goldstone	061P	04 05 061 0	5561		
	121W	2-4	Goldstone	114F	03 05 114 0	5114	555-526	
			Woomera	114F	06 05 114 0	5314	555-526	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	114F	05 05 114 0	5814		
	122T	3-4	Goldstone	114F	03 05 114 0	5114	525-504	
			Woomera	114F	06 05 114 0	5314	525-504	
			Woomera	115F	06 05 115 0	5115	503-429	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	114F	05 05 114 0	5814		
			Woomera	115F	05 05 115 0	5615		
	122W	3-4	Goldstone	114F	03 05 114 0	5114	687-658	
			Woomera	114F	06 05 114 0	5314	687-658	
			Woomera	063P	05 05 063 0	5063	688-688	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	114F	05 05 114 0	5814		
			Woomera	063P	06 05 063 0	5563		
	123T	4-4	Goldstone	114F	03 05 114 0	5114	657-559	
			Woomera	114F	06 05 114 0	5314	657-559	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	114F	05 05 114 0	5814		
	123W	4-4	Goldstone	114F	03 05 114 0	5114	819-790	
			Woomera	114F	06 05 114 0	5314	819-790	
			Woomera	064P	05 05 064 0	5064	819-790	
			Woomera	063P	05 05 063 0	5264	805-790	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	114F	05 05 114 0	5814		
			Woomera	064P	06 05 064 0	5564		
			Woomera	063P	06 05 063 0	5764		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-30	125T	1-4	Goldstone	114F	03 05 114 0	5114	917-824	Tycho
			Woomera	067P	06 05 067 0	5064	917-820	
			Goldstone	114F	04 05 114 0	5614		
			Woomera	064P	06 05 064 0	5564		
	125W	1-4	Goldstone	113F	03 05 113 0	5113	051-052	
			Woomera	067P	06 05 067 0	5067	051-052	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	067P	05 05 067 0	5567		
	126T	2-4	Goldstone	113F	03 05 113 0	5113	049-030	
			Goldstone	114F	03 05 114 0	5114	029-953	
			Woomera	064P	05 05 064 0	5064	049-953	
			Woomera	067P	06 05 067 0	5064	049-048	
			Goldstone	113F	04 05 113 0	5613		
			Goldstone	114F	04 05 114 0	5614		
			Woomera	064P	06 05 064 0	5564		
			Woomera	067P	05 05 067 0	5564		
	126W	2-4	Goldstone	113F	03 05 113 0	5113	211-183	
			Woomera	066P	06 05 066 0	5066	211-183	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	066P	05 05 066 0	5566		
	127T	3-4	Goldstone	113F	03 05 113 0	5113	182-085	
			Woomera	066P	06 05 066 0	5066	182-115	
			Woomera	067P	06 05 067 0	5067	114-085	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	066P	05 05 066 0	5566		
			Woomera	067P	05 05 067 0	5567		
	127W	3-4	Goldstone	113F	03 05 113 0	5113	344-315	
			Woomera	066P	06 05 066 0	5066	343-315	
			Goldstone	113F	04 05 113 0	5516		
			Woomera	066P	05 05 066 0	5566		
	128T	4-4	Goldstone	113F	03 05 113 0	5113	314-215	
			Woomera	066P	06 05 066 0	5066	314-217	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	066P	05 05 066 0	5566		
	128W	4-4	Goldstone	113F	03 05 113 0	5113	476-447	
			Woomera	066P	06 05 066 0	5066	152-447	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	066P	05 05 066 0	5567		
V-31	129T	1-4	Goldstone	113F	03 05 113 0	5113	445-349	Sinuous Rille East of Plato
			Woomera	066P	06 05 066 0	5066	445-349	
			Goldstone	113F	04 05 113 0	5613		
			Woomera	066P	05 05 066 0	5566		
	129W	1-4	Goldstone	112F	03 05 112 0	5112	607-578	
			Goldstone	112F	04 05 112 0	5612		
	130T	2-4	Goldstone	112F	03 05 112 0	5112	575-555	
			Goldstone	113F	03 05 113 0	5113	554-479	
			Goldstone	112F	04 05 112 0	5612		
			Goldstone	113F	04 05 113 0	5613		
	130W	2-4	Goldstone	112F	03 05 112 0	5112	737-709	
			Madrid	112F	08 05 112 0	5312	737-709	
			Madrid	068P	08 05 068 0	5068	737-709	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-31	131T	3-4	Goldstone	112F	03 05 112 0	5112	707-610	
			Madrid	112F	08 05 112 0	5312	707-684	
			Madrid	068P	08 05 068 0	5068	707-639	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		
	131W	3-4	Goldstone	112F	03 05 112 0	5112	869-840	
			Madrid	112F	08 05 112 0	5312	869-840	
			Madrid	068P	08 05 068 0	5068	869-840	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		
	132T	4-4	Goldstone	112F	03 05 112 0	5112	837-741	
			Madrid	112F	08 05 112 0	5312	837-741	
			Madrid	068P	08 05 068 0	5068	837-741	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		
	132W	4-4	Goldstone	112F	03 05 112 0	5112	000-972	
			Madrid	112F	08 05 112 0	5312	000-972	
			Madrid	068P	08 05 068 0	5068	975-972	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		
V-32	133T	1-4	Goldstone	112F	03 05 112 0	5112	971-873	Eratosthenes
			Madrid	112F	08 05 112 0	5312	971-873	
			Madrid	068P	08 05 068 0	5068	971-873	
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	068P	07 05 068 0	5568		
	133W	1-4	Madrid	111F	08 05 111 0	5111	132-103	
			Goldstone	111F	03 05 111 0	5311	132-103	
			Madrid	069P	08 05 069 0	5069	132-103	
			Madrid	111F	07 05 111 0	5611		
			Goldstone	111F	04 05 111 0	5811		
			Madrid	069P	07 05 069 0	5569		
	134T	2-4	Madrid	111F	08 05 111 0	5111	099-081	
			Goldstone	111F	03 05 111 0	5311	099-081	
			Goldstone	112F	03 05 112 0	5112	080-003	
			Madrid	112F	08 05 112 0	5312	080-003	
			Madrid	069P	08 05 069 0	5069	099-014	
			Madrid	111F	07 05 111 0	5611		
			Goldstone	111F	04 05 111 0	5811		
			Goldstone	112F	04 05 112 0	5612		
			Madrid	112F	07 05 112 0	5812		
			Madrid	069P	07 05 069 0	5569		
	134W	2-4	Madrid	111F	08 05 111 0	5111	261-233	
			Madrid	069P	08 05 069 0	5069	261-233	
			Madrid	111F	07 05 111 0	5611		
			Madrid	069P	07 05 069 0	5569		
	135T	3-4	Madrid	111F	08 05 111 0	5110	232-135	
			Goldstone	111F	03 05 111 0	5310	191-135	
			Madrid	069P	08 05 069 0	5069	232-135	
			Madrid	111F	07 05 111 0	5610		
			Goldstone	111F	04 05 111 0	5810		
			Madrid	069P	07 05 069 0	5569		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-32	135W	3-4	Madrid	111F	08 05 111 0	5111	394-365	
			Madrid	069P	08 05 069 0	5069	394-365	
			Madrid	111F	07 05 111 0	5611		
			Madrid	069P	07 05 069 0	5569		
	136T	4-4	Madrid	111F	08 05 111 0	5111	362-266	
			Madrid	069P	08 05 069 0	5069	362-266	
			Madrid	111F	07 05 111 0	5611		
			Madrid	069P	07 05 069 0	5569		
	136W	4-4	Madrid	111F	08 05 111 0	5111	525-496	
			Madrid	111F	07 05 111 0	5611		
V-33	137T	1-1	Madrid	111F	08 05 111 0	5111	495-399	
			Madrid	069P	08 05 069 0	5069	493-399	
			Madrid	111F	07 05 111 0	5611		
			Madrid	069P	07 05 069 0	5569		
	137W	1-1	Madrid	110F	08 05 110 0	5110	657-628	
			Goldstone	070P	03 05 070 0	5070	657-628	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	070P	04 05 070 0	5570		
V-34	138T	1-4	Madrid	110F	08 05 110 0	5110	625-607	Area of Copernicus CD
			Madrid	111F	08 05 111 0	5111	606-528	
			Goldstone	070P	03 05 070 0	5070	625-543	
			Madrid	110F	07 05 110 0	5610		
			Madrid	111F	07 05 111 0	5611		
			Goldstone	070P	04 05 070 0	5570		
	138W	1-4	Madrid	110F	08 05 110 0	5110	786-757	
			Goldstone	070P	03 05 070 0	5070	786-757	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	070P	04 05 070 0	5570		
	139T	2-4	Madrid	110F	08 05 110 0	5110	755-659	
			Goldstone	070P	03 05 070 0	5070	755-659	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	070P	04 05 070 0	5570		
	139W	2-4	Madrid	110F	08 05 110 0	5110	918-889	
			Goldstone	071P	03 05 071 0	5071	918-889	
			Goldstone	070P	03 05 070 0	5070	893-889	
			Madrid	070P	08 05 070 0	5270	893-889	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	071P	04 05 071 0	5571		
			Goldstone	070P	04 05 070 0	5570		
			Madrid	070P	07 05 070 0	5770		
	140T	3-4	Madrid	110F	08 05 110 0	5110	888-791	
			Goldstone	070P	03 05 070 0	5070	888-791	
			Madrid	070P	08 05 070 0	5270	888-825	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	070P	04 05 070 0	5570		
			Madrid	070P	07 05 070 0	5770		
	140W	3-4	Madrid	110F	08 05 110 0	5110	050-021	
			Goldstone	071P	03 05 071 0	5071	050-021	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	071P	04 05 071 0	5571		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-34	141T	4-4	Madrid	110F	05 05 110 0	5110	019-922	Crater Fra Mauro
			Goldstone	071P	03 05 071 0	5071	019-922	
			Madrid	110F	07 05 110 0	5610		
			Goldstone	071P	04 05 071 0	5571		
	141W	4-4	Woomera	109F	05 05 109 0	5109	181-153	
			Goldstone	071P	03 05 071 0	5071	181-153	
			Woomera	109F	06 05 109 0	5609		
			Goldstone	071P	04 05 071 0	5571		
V-35	142T	1-4	Woomera	109F	05 05 109 0	5109	151-130	Copernicus Secondaries
			Madrid	110F	08 05 110 0	5110	129-054	
			Goldstone	071P	03 05 071 0	5071	151-054	
			Woomera	109F	06 05 109 0	5609		
			Madrid	110F	07 05 111 0	5610		
			Goldstone	071P	04 05 071 0	5571		
	142W	1-4	Woomera	109F	05 05 109 0	5109	313-284	
			Woomera	109F	06 05 109 0	5609		
	143T	2-4	Woomera	109F	05 05 109 0	5109	281-184	
			Goldstone	071P	03 05 071 0	5071	281-184	
			Woomera	109F	06 05 109 0	5609		
			Goldstone	071P	04 05 071 0	5571		
	143W	2-4	Woomera	109F	05 05 109 0	5109	443-414	
			Goldstone	072P	03 05 072 0	5072	443-414	
			Woomera	072P	06 05 072 0	5272	443-414	
			Woomera	109F	06 05 109 0	5609		
			Goldstone	072P	04 05 072 0	5572		
			Woomera	072P	05 05 072 0	5772		
	144T	3-4	Woomera	109F	05 05 109 0	5109	413-317	
			Goldstone	072P	03 05 072 0	5072	413-317	
			Woomera	072P	06 05 072 0	5272	413-317	
			Woomera	109F	06 05 109 0	5609		
			Goldstone	072P	04 05 072 0	5572		
			Woomera	072P	05 05 072 0	5772		
	144W	3-4	Woomera	108F	05 05 108 0	5108	575-555	
			Woomera	109F	05 05 109 0	5109	554-517	
			Goldstone	072P	03 05 072 0	5072	575-547	
			Woomera	072P	06 05 072 0	5272	575-547	
			Woomera	108F	06 05 108 0	5608		
			Woomera	109F	06 05 109 0	5609		
			Goldstone	072P	04 05 072 0	5572		
			Woomera	072P	05 05 072 0	5772		
	145T	4-4	Woomera	109F	05 05 109 0	5109	545-448	
			Goldstone	072P	03 05 072 0	5072	545-448	
			Woomera	072P	06 05 072 0	5272	545-448	
			Woomera	109F	06 05 109 0	5609		
			Goldstone	072P	04 05 072 0	5572		
			Woomera	072P	05 05 072 0	5772		
	145W	4-4	Woomera	108F	05 05 108 0	5108	706-677	
			Woomera	073P	06 05 073 0	5073	706-677	
			Woomera	108F	06 05 108 0	5608		
			Woomera	073P	05 05 073 0	5573		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-36	146T	1-4	Woomera	108F	05 05 108 0	5108	676-550	Copernicus H
			Goldstone	072P	03 05 072 0	5072	673-580	
			Woomera	072P	06 05 072 0	5272	673-580	
			Woomera	073P	06 05 073 0	5073	676-667	
			Woomera	108F	06 05 108 0	5608		
			Goldstone	072P	04 05 072 0	5572		
			Woomera	072P	05 05 072 0	5772		
			Woomera	073P	05 05 073 0	5573		
	146W	1-4	Woomera	108F	05 05 108 0	5108	838-809	
			Woomera	073P	06 05 073 0	5073	838-809	
			Woomera	108F	06 05 108 0	5608		
			Woomera	073P	05 05 073 0	5573		
	147T	2-4	Woomera	108F	05 05 108 0	5108	806-710	
			Woomera	073P	06 05 073 0	5073	806-710	
			Woomera	108F	06 05 108 0	5608		
			Woomera	073P	05 05 073 0	5573		
	147W	2-4	Woomera	108F	05 05 108 0	5108	968-939	
			Woomera	073P	06 05 073 0	5073	968-939	
			Woomera	108F	06 05 108 0	5608		
			Woomera	073P	05 05 073 0	5573		
	148T	3-4	Woomera	108F	05 05 108 0	5108	938-842	
			Woomera	073P	06 05 073 0	5073	938-842	
			Woomera	108F	06 05 108 0	5608		
			Woomera	073P	05 05 073 0	5573		
	148W	3-4	Woomera	107F	05 05 107 0	5107	100-072	
			Woomera	074P	05 05 074 0	5074	100-072	
			Woomera	107F	06 05 107 0	5607		
			Woomera	074P	06 05 074 0	5574		
	149T	4-4	Woomera	107F	05 05 107 0	5107	069-02[illegible]	
			Woomera	108F	05 05 108 0	5108	02[illegible]-9[illegible]	
			Woomera	074P	05 05 074 0	5074	069-0[illegible]	
			Woomera	073P	06 05 073 0	5073	062-9[illegible]	
			Woomera	107F	06 05 107 0	5607		
			Woomera	108F	06 05 108 0	5608		
			Woomera	074P	06 05 074 0	5574		
			Woomera	073P	05 05 073 0	5573		
	149W	4-4	Woomera	107F	05 05 107 0	5107	232-204	
			Woomera	074P	05 05 074 0	5074	232-204	
			Woomera	107F	06 05 107 0	5607		
			Woomera	074P	06 05 074 0	5574		
V-37	150T	1-8	Woomera	107F	05 05 107 0	5107	200-104	Copernicus
			Woomera	074P	05 05 074 0	5074	200-104	
			Woomera	107F	06 05 107 0	5607		
			Woomera	074P	06 05 074 0	5574		
	150W	1-8	Woomera	107F	05 05 107 0	5107	362-334	
			Goldstone	107F	03 05 107 0	5307	362-348	
			Woomera	074P	05 05 074 0	5074	362-334	
			Woomera	107F	06 05 107 0	5607		
			Goldstone	107F	04 05 107 0	5807		
			Woomera	074P	06 05 074 0	5574		
	151T	2-8	Woomera	107F	05 05 107 0	5107	330-234	
			Woomera	074P	05 05 074 0	5074	330-234	
			Woomera	107F	06 05 107 0	5607		
			Woomera	074P	06 05 074 0	5574		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-37	151W	2-8	Woomera	107F	05 05 107 0	5107	492-463		
			Goldstone	107F	03 05 107 0	5307	492-463		
			Woomera	074P	05 05 074 0	5074	482-463		
			Woomera	107F	06 05 107 0	5607			
			Goldstone	107F	04 05 107 0	5807			
			Woomera	074P	06 05 074 0	5574			
	152T	3-8	Woomera	107F	05 05 107 0	5107	463-367		
			Goldstone	107F	03 05 107 0	5307	463-367		
			Woomera	074P	05 05 074 0	5074	463-367		
			Woomera	107F	06 05 107 0	5607			
			Goldstone	107F	04 05 107 0	5807			
			Woomera	074P	06 05 074 0	5574			
	152W	3-8	Goldstone	106F	03 05 106 0	5106	625-596		
			Woomera	106F	05 05 106 0	5306	625-596		
			Madrid	077P	08 05 077 0	5077	625-596		
			Goldstone	106F	04 05 106 0	5606			
			Woomera	106F	06 05 106 0	5806			
			Madrid	077P	07 05 077 0	5577			
	153T	4-8	Goldstone	106F	03 05 106 0	5106	594-548		
			Woomera	106F	05 05 106 0	5306	594-548		
			Woomera	107F	05 05 107 0	5107	547-497		
			Goldstone	107F	03 05 107 0	5307	547-497		
			Madrid	077P	08 05 077 0	5077	594-535		
			Goldstone	106F	04 05 106 0	5606			
			Woomera	106F	06 05 106 0	5806			
			Woomera	107F	06 05 107 0	5607			
			Goldstone	107F	04 05 107 0	5807			
			Madrid	077P	07 05 077 0	5577			
	153W	4-8	Goldstone	106F	03 05 106 0	5106	756-728		
			Woomera	075P	06 05 075 0	5075	756-743		
			Woomera	076P	06 05 076 0	5076	742-728		
			Goldstone	106F	04 05 106 0	5606			
			Woomera	075P	05 05 075 0	5575			
			Woomera	076P	05 05 076 0	5576			
	154T	5-8	Goldstone	106F	03 05 106 0	5106	726-629		
			Woomera	106F	05 05 106 0	5306	659-629		
			Woomera	076P	06 05 076 0	5076	726-684		
			Madrid	077P	08 05 077 0	5077	683-629		
			Goldstone	106F	04 05 106 0	5606			
			Woomera	106F	06 05 106 0	5806			
			Woomera	076P	05 05 076 0	5576			
			Madrid	077P	07 05 077 0	5577			
	154W	5-8	Goldstone	106F	03 05 106 0	5106	888-859		
			Madrid	078P	08 05 078 0	5078	888-887		
			Woomera	075P	06 05 075 0	5075	862-859		
			Goldstone	106F	04 05 106 0	5606			
			Madrid	078P	07 05 078 0	5578			
			Woomera	075P	05 05 075 0	5575			
	155T	6-8	Goldstone	106F	03 05 106 0	5106	857-761		
			Woomera	075P	06 05 075 0	5075	857-761		
			Goldstone	106F	04 05 106 0	5606			
			Woomera	075P	05 05 075 0	5575			
	155W	6-8	Goldstone	106F	03 05 106 0	5106	019-990		
			Madrid	078P	08 05 078 0	5078	019-990		
			Goldstone	106F	04 05 106 0	5607			
			Madrid	078P	07 05 078 0	5578			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-37	156T	7-8	Goldstone	106F	03 05 106 0	5106	989-892	
			Madrid	078P	08 05 078 0	5078	989-892	
			Goldstone	106F	04 05 106 0	5607		
			Madrid	078P	07 05 078 0	5578		
	156W	7-8	Goldstone	105F	03 05 109 0	5105	150-121	
			Madrid	078P	08 05 078 0	5078	150-121	
			Goldstone	105F	04 05 105 0	5605		
			Madrid	078P	07 05 078 0	5578		
	157T	8-8	Goldstone	105F	03 05 105 0	5105	120-071	
			Goldstone	106F	03 05 106 0	5106	070-023	
			Madrid	078P	08 05 078 0	5078	120-023	
			Goldstone	105F	04 05 105 0	5605		
			Goldstone	106F	04 05 106 0	5606		
			Madrid	078P	07 05 078 0	5578		
	157W	8-8	Goldstone	105F	03 05 105 0	5105	282-253	
			Madrid	078P	08 05 078 0	5078	282-253	
			Goldstone	105F	04 05 105 0	5605		
			Madrid	078P	07 05 078 0	5578		
V-38	159T	1-4	Goldstone	105F	03 05 105 0	5105	382-286	Imbrium Flows
			Madrid	078P	08 05 078 0	5078	378-286	
			Goldstone	105F	04 05 105 0	5605		
			Madrid	078P	07 05 078 0	5578		
	159W	1-4	Goldstone	105F	03 05 105 0	5105	544-515	
			Madrid	079P	08 05 079 0	5079	544-515	
			Goldstone	105F	04 05 105 0	5605		
			Madrid	079P	07 05 079 0	5579		
	160T	2-4	Goldstone	105F	03 05 105 0	5105	513-416	
			Madrid	079P	08 05 079 0	5079	513-416	
			Goldstone	079P	03 05 079 0	5279	423-416	
			Goldstone	105F	04 05 105 0	5605		
			Madrid	079P	07 05 079 0	5579		
			Goldstone	079P	04 05 079 0	5779		
	160W	2-4	Goldstone	104F	03 05 104 0	5104	675-646	
			Madrid	104F	08 05 104 0	5304	675-646	
			Madrid	079P	08 05 079 0	5079	675-646	
			Goldstone	104F	04 05 104 0	5604		
			Madrid	104F	07 05 104 0	5804		
			Madrid	079P	07 05 079 0	5579		
	161T	3-4	Goldstone	104F	03 05 104 0	5104	644-592	
			Madrid	104F	08 05 104 0	5304	644-592	
			Goldstone	105F	03 05 105 0	5105	591-548	
			Madrid	079P	08 05 079 0	5079	644-548	
			Goldstone	104F	04 05 104 0	5604		
			Madrid	104F	07 05 104 0	5804		
			Goldstone	105F	04 05 105 0	5605		
			Madrid	079P	07 05 079 0	5579		
	161W	3-4	Goldstone	104F	03 05 104 0	5104	807-778	
			Madrid	104F	08 05 104 0	5304	807-778	
			Goldstone	104F	04 05 104 0	5604		
			Madrid	104F	07 05 104 0	5804		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-38	162T	4-4	Goldstone	104F	03 05 104 0	5104	776-679	
			Madrid	104F	08 05 104 0	5304	776-679	
			Madrid	079P	08 05 079 0	5079	776-679	
			Goldstone	104F	04 05 104 0	5604		
			Madrid	104F	07 05 104 0	5804		
			Madrid	079P	07 05 079 0	5579		
	162W	4-4	Madrid	103F	08 05 103 0	5103	938-910	
			Goldstone	103F	03 05 103 0	5303	938-910	
			Goldstone	080P	03 05 080 0	5080	938-910	
			Madrid	103F	07 05 103 0	5603		
			Goldstone	103F	04 05 103 0	5803		
			Goldstone	080P	04 05 080 0	5580		
V-40	164T	1-4	Madrid	103F	08 05 103 0	5103	037-941	Tobias Mayer Dome
			Goldstone	103F	03 05 103 0	5303	037-941	
			Goldstone	080P	03 05 080 0	5080	037-941	
			Madrid	103F	07 05 103 0	5603		
			Goldstone	103F	04 05 103 0	5803		
			Goldstone	080P	04 05 080 0	5580		
	164W	1-4	Madrid	102F	08 05 102 0	5102	200-171	
			Goldstone	081P	03 05 081 0	5081	200-195	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	165T	2-4	Madrid	102F	08 05 102 0	5102	168-077	
			Madrid	103F	08 05 103 0	5103	076-072	
			Goldstone	080P	03 05 080 0	5080	163-072	
			Madrid	102F	07 05 102 0	5602		
			Madrid	103F	07 05 103 0	5603		
			Goldstone	080P	04 05 080 0	5580		
	165W	2-4	Madrid	102F	08 05 102 0	5102	330-302	
			Goldstone	081P	03 05 081 0	5081	330-302	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	166T	3-4	Madrid	102F	08 05 102 0	5102	301-203	
			Goldstone	081P	03 05 081 0	5081	301-204	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	166W	3-4	Madrid	102F	08 05 102 0	5102	463-434	
			Goldstone	081P	03 05 081 0	5081	463-434	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	167T	4-4	Madrid	102F	08 05 102 0	5102	432-336	
			Goldstone	081P	03 05 081 0	5081	432-336	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	167W	4-4	Madrid	102F	08 05 102 0	5102	594-565	
			Goldstone	081P	03 05 081 0	5081	594-565	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-41	165T	1-1	Madrid	102F	08 05 102 0	5102	564-466	Vitello
			Goldstone	081P	03 05 081 0	5081	564-466	
			Madrid	102F	07 05 102 0	5602		
			Goldstone	081P	04 05 081 0	5581		
	168W	1-1	Madrid	101F	08 05 101 0	5101	726-697	
			Madrid	101F	07 05 101 0	5601		
V-43.2	177T	1-4	Woomera	099F	05 05 099 0	5099	745-649	Gassendi
			Woomera	083P	05 05 083 0	5083	745-649	
			Woomera	099F	06 05 099 0	5599		
			Woomera	083P	06 05 083 0	5583		
	177W	1-4	Woomera	099F	05 05 099 0	5099	908-879	
			Woomera	099F	06 05 099 0	5599		
	178T	2-4	Woomera	099F	05 05 099 0	5099	876-780	
			Woomera	083P	05 05 083 0	5083	876-780	
			Woomera	099F	06 05 099 0	5599		
			Woomera	083P	06 05 083 0	5583		
	178W	2-4	Woomera	099F	05 05 099 0	5099	038-009	
			Woomera	084P	06 05 084 0	5084	038-009	
			Woomera	099F	06 05 099 0	5599		
			Woomera	084P	05 05 084 0	5584		
	179T	3-4	Woomera	099F	05 05 099 0	5099	008-912	
			Woomera	084P	06 05 084 0	5084	008-917	
			Woomera	099F	06 05 099 0	5599		
			Woomera	084P	05 05 084 0	5584		
	179W	3-4	Woomera	098F	06 05 098 0	5098	170-141	
			Woomera	084P	06 05 084 0	5084	170-141	
			Woomera	098F	05 05 098 0	5598		
			Woomera	084P	05 05 084 0	5584		
	180T	4-4	Woomera	098F	06 05 098 0	5098	139-103	
			Woomera	099F	05 05 099 0	5099	102-0[illegible]	
			Woomera	084P	06 05 084 0	5084	139-0[illegible]	
			Woomera	098F	05 05 098 0	5598		
			Woomera	099F	06 05 099 0	5599		
			Woomera	084P	05 05 084 0	5584		
	180W	4-4	Woomera	098F	06 05 098 0	5098	301-273	
			Woomera	084P	06 05 084 0	5084	301-273	
			Woomera	098F	05 05 098 0	5598		
			Woomera	084P	05 05 084 0	5584		
V-45.1	182T	1-4	Woomera	098F	06 05 098 0	5098	400-304	Jura Domes
			Goldstone	098F	03 05 098 0	5298	400-323	
			Woomera	084P	06 05 084 0	5084	400-304	
			Woomera	098F	05 05 098 0	5598		
			Goldstone	098F	04 05 098 0	5798		
			Woomera	084P	05 05 084 0	5584		
	182W	1-4	Goldstone	097F	03 05 097 0	5097	563-534	
			Goldstone	097F	04 05 097 0	5597		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-45.1	183T	2-4	Goldstone	097F	03 05 097 0	5097	532-459	
			Woomera	098F	06 05 098 0	5098	458-435	
			Goldstone	098F	03 05 098 0	5598	458-435	
			Goldstone	097F	04 05 097 0	5597		
			Woomera	098F	05 05 098 0	5598		
			Goldstone	098F	04 05 098 0	5598		
	183W	2-4	Goldstone	097F	03 05 097 0	5097	693-664	
			Goldstone	097F	04 05 097 0	5597		
	184T	3-4	Goldstone	097F	03 05 097 0	5097	663-567	
			Goldstone	097F	04 05 097 0	5597		
	184W	3-4	Goldstone	097F	03 05 097 0	5097	825-796	
			Goldstone	097F	04 05 097 0	5597		
	185T	4-4	Goldstone	097F	03 05 097 0	5097	795-699	
			Goldstone	097F	04 05 097 0	5597		
	185W	4-4	Goldstone	097F	03 05 097 0	5097	957-929	
			Madrid	085P	07 05 085 0	5085	957-929	
			Goldstone	097F	04 05 097 0	5597		
			Madrid	085P	08 05 085 0	5585		
V-46	186T	1-8	Goldstone	097F	03 05 097 0	5097	927-831	Harbinger Mountains
			Madrid	085P	07 05 085 0	5085	927-839	
			Goldstone	097F	04 05 097 0	5597		
			Madrid	085P	08 05 085 0	5585		
	186W	1-8	Goldstone	096F	03 05 096 0	5096	089-085	
			Goldstone	097F	03 05 097 0	5097	084-060	
			Madrid	085P	07 05 085 0	5085	089-060	
			Goldstone	096F	04 05 096 0	5596		
			Goldstone	097F	04 05 097 0	5597		
			Madrid	085P	08 05 085 0	5585		
	187T	2-8	Goldstone	097F	03 05 097 0	5097	057-961	
			Madrid	085P	07 05 085 0	5085	057-961	
			Goldstone	097F	04 05 097 0	5597		
			Madrid	085P	08 05 085 0	5585		
	187W	2-8	Goldstone	096F	03 05 096 0	5096	219-190	
			Goldstone	096F	04 05 096 0	5596		
	188T	3-8	Goldstone	096F	03 05 096 0	5096	189-093	
			Madrid	085P	07 05 085 0	5085	108-093	
			Goldstone	096F	04 05 096 0	5596		
			Madrid	085P	08 05 085 0	5585		
	188W	3-8	Goldstone	096F	03 05 096 0	5096	351-322	
			Goldstone	096F	04 05 096 0	5596		
	189T	4-8	Goldstone	096F	03 05 096 0	5096	321-225	
			Goldstone	096F	04 05 096 0	5596		
	189W	4-8	Goldstone	096F	03 05 096 0	5096	483-454	
			Goldstone	096F	04 05 096 0	5596		
	190T	5-8	Goldstone	096F	03 05 096 0	5096	453-357	
			Goldstone	096F	04 05 096 0	5596		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-46	190W	5-8	Madrid	095F	08 05 095 0	5095	615-601	
			Goldstone	096F	03 05 096 0	5096	600-586	
			Goldstone	095F	03 05 095 0	5295	615-601	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	096F	04 05 096 0	5596		
			Goldstone	095F	04 05 095 0	5795		
	191T	6-8	Goldstone	096F	03 05 096 0	5096	585-487	
			Goldstone	096F	04 05 096 0	5596		
	191W	6-8	Madrid	095F	08 05 095 0	5095	747-718	
			Goldstone	095F	03 05 095 0	5295	747-718	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	095F	04 05 095 0	5795		
	192T	7-8	Madrid	095F	08 05 095 0	5095	715-619	
			Goldstone	095F	03 05 095 0	5295	715-619	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	095F	04 05 095 0	5795		
	192W	7-8	Madrid	095F	08 05 095 0	5095	878-848	
			Goldstone	095F	03 05 095 0	5295	878-848	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	095F	04 05 095 0	5795		
	193T	8-8	Madrid	095F	08 05 095 0	5095	846-750	
			Goldstone	095F	03 05 095 0	5295	846-750	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	095F	04 05 095 0	5795		
	193W	8-8	Madrid	095F	08 05 095 0	5095	008-979	
			Madrid	095F	07 05 095 0	5595		
V-45	194T	1-8	Madrid	095F	08 05 095 0	5095	977-881	Aristarchus
			Goldstone	095F	03 05 095 0	5295	977-881	
			Madrid	095F	07 05 095 0	5595		
			Goldstone	095F	04 05 095 0	5795		
	194W	1-8	Madrid	094F	08 05 094 0	5094	139-127	
			Madrid	095F	08 05 095 0	5095	126-111	
			Madrid	094F	07 05 094 0	5594		
			Madrid	095F	07 05 094 0	5595		
	195T	2-8	Madrid	095F	08 05 095 0	5095	107-010	
			Madrid	095F	07 05 095 0	5595		
	195W	2-8	Madrid	094F	08 05 094 0	5094	270-241	
			Madrid	086P	08 05 086 0	5086	270-241	
			Madrid	094F	07 05 094 0	5594		
			Madrid	086P	07 05 086 0	5586		
	196T	3-8	Madrid	094F	08 05 094 0	5094	239-143	
			Madrid	086P	08 05 086 0	5086	239-145	
			Madrid	094F	07 05 094 0	5594		
			Madrid	086P	07 05 086 0	5586		
	196W	3-8	Madrid	094F	08 05 094 0	5094	402-373	
			Madrid	086P	08 05 086 0	5086	402-373	
			Madrid	094F	07 05 094 0	5594		
			Madrid	086P	07 05 086 0	5586		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-48	197T	4-8	Madrid	094F	08 05 094 0	5094	372-276	
			Madrid	086P	08 05 086 0	5086	372-276	
			Madrid	094F	07 05 094 0	5594		
			Madrid	086P	07 05 086 0	5586		
	197W	4-8	Madrid	094F	08 05 094 0	5094	534-505	
			Madrid	094F	07 05 094 0	5594		
	198T	5-8	Madrid	094F	08 05 094 0	5094	504-406	
			Madrid	086P	08 05 086 0	5086	407-406	
			Madrid	094F	07 05 094 0	5594		
			Madrid	086P	07 05 094 0	5586		
	198W	5-8	Madrid	093F	08 05 093 0	5093	665-648	
			Madrid	094F	08 05 094 0	5094	647-637	
			Madrid	093F	07 05 093 0	5593		
			Madrid	094F	07 05 094 0	5594		
	199T	6-8	Madrid	094F	08 05 094 0	5094	634-537	
			Madrid	094F	07 05 094 0	5594		
	199W	6-8	Madrid	093F	08 05 093 0	5093	796-767	
			Madrid	093F	07 05 093 0	5593		
	200T	7-8	Madrid	093F	08 05 093 0	5093	765-669	
			Madrid	093F	07 05 093 0	5593		
	200W	7-8	Madrid	093F	08 05 093 0	5093	928-899	
			Madrid	087P	08 05 087 0	5087	928-899	
			Goldstone	087P	03 05 087 0	5287	928-899	
			Madrid	093F	07 05 093 0	5593		
			Madrid	087P	07 05 087 0	5587		
			Goldstone	087P	04 05 087 0	5787		
	201T	8-8	Madrid	093F	08 05 093 0	5093	897-801	
			Madrid	087P	08 05 087 0	5087	897-880	
			Goldstone	087P	03 05 087 0	5287	897-880	
			Madrid	093F	07 05 093 0	559		
			Madrid	087P	07 05 087 0	5587		
			Goldstone	087P	04 05 087 0	5787		
	201W	8-8	Madrid	093F	08 05 093 0	5093	060-031	
			Madrid	087P	08 05 087 0	5087	060-031	
			Madrid	093F	07 05 093 0	559		
			Madrid	087P	07 05 087 0	5587		
V-49	202T	1-4	Madrid	093F	08 05 093 0	5093	029-933	Cobra Head
			Madrid	087P	08 05 087 0	5087	029-933	
			Madrid	093F	07 05 093 0	5593		
			Madrid	087P	07 05 087 0	5587		
	202W	1-4	Woomera	092F	06 05 092 0	5092	191-162	
			Madrid	087P	08 05 087 0	5087	178-162	
			Woomera	092F	05 05 092 0	5592		
			Madrid	087P	07 05 087 0	5587		
	203T	2-4	Woomera	092F	06 05 092 0	5092	160-113	
			Madrid	093F	08 05 093 0	5093	112-063	
			Madrid	087P	08 05 087 0	5087	160-063	
			Woomera	093F	06 05 093 0	5293	112-094	
			Woomera	092F	05 05 092 0	5592		
			Madrid	093F	07 05 093 0	5593		
			Madrid	087P	07 05 087 0	5587		
			Woomera	093F	05 05 093 0	5793		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS
V-49	203W	2-4	Woomera	092 F	06 05 092 0	5092	321-293	
			Woomera	092 F	05 05 092 0	5592		
	204T	3-4	Woomera	092 F	06 05 092 0	5092	289-193	
			Woomera	092 F	05 05 092 0	5592		
	204W	3-4	Woomera	092 F	06 05 092 0	5092	451-423	
			Woomera	092 F	05 05 092 0	5592		
	205T	4-4	Woomera	092 F	06 05 092 0	5092	420-325	
			Woomera	092 F	05 05 092 0	5592		
	205W	4-4	Woomera	091 F	05 05 091 0	5091	582-580	
			Woomera	092 F	06 05 092 0	5092	579-554	
			Woomera	091 F	06 05 091 0	5591		
			Woomera	092 F	05 05 092 0	5592		
V-50	206T	1-4	Woomera	092 F	05 05 092 0	5092	552-456	Aristarchus Plateau
			Woomera	092 F	06 05 092 0	5592		
	206W	1-4	Woomera	091 F	05 05 091 0	5091	714-686	
			Woomera	091 F	06 05 091 0	5591		
	207T	2-4	Woomera	091 F	05 05 091 0	5091	683-587	
			Woomera	091 F	06 05 091 0	5591		
	207W	2-4	Woomera	091 F	05 05 091 0	5091	845-817	
			Woomera	091 F	06 05 091 0	5591		
	208T	3-4	Woomera	091 F	05 05 091 0	5091	815-718	
			Woomera	091 F	06 05 091 0	5591		
	208W	3-4	Woomera	091 F	05 05 091 0	5091	977-949	
			Woomera	091 F	06 05 091 0	5591		
	209T	4-4	Woomera	091 F	05 05 091 0	5091	945-839	
			Woomera	091 F	06 05 091 0	5591		
	209W	4-4	Woomera	090 F	06 05 090 0	5090	107-080	
			Woomera	090 F	05 05 090 0	5590		
V-51	210T	1-8	Woomera	090 F	06 05 090 0	5090	077-038	Marius Hills
			Woomera	091 F	05 05 091 0	5091	037-981	
			Woomera	090 F	05 05 090 0	5590		
			Woomera	091 F	06 05 091 0	5591		
	210W	1-8	Woomera	090 F	06 05 090 0	5090	239-211	
			Goldstone	090 F	03 05 090 0	5290	239-211	
			Woomera	090 F	05 05 090 0	5590		
			Goldstone	090 F	04 05 090 0	5790		
	211T	2-8	Woomera	090 F	06 05 090 0	5090	208-112	
			Goldstone	090 F	03 05 090 0	5290	208-198	
			Woomera	090 F	05 05 090 0	5590		
			Goldstone	090 F	04 05 090 0	5790		
	211W	2-8	Woomera	090 F	06 05 090 0	5090	370-341	
			Goldstone	090 F	03 05 090 0	5290	370-341	
			Woomera	090 F	05 05 090 0	5590		
			Goldstone	090 F	04 05 090 0	5790		

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
[illegible]	212[illegible]	[illegible]	Woomera	090[illegible]	06 05 090 0	5090	[illegible]40-244		
			Goldstone	090F	03 04 090 0	5290	340-244		
			Woomera	090F	05 05 090 0	5590			
			Goldstone	090F	04 05 090 0	5790			
	212W	3-8	Goldstone	089F	03 05 089 0	5089	502-474		
			Goldstone	089F	04 05 089 0	5589			
	213T	4-8	Goldstone	089F	03 05 089 0	5089	17[illegible]-45[illegible]		
			Woomera	090F	06 05 090 0	5090	45[illegible]-576		
			Goldstone	090F	03 05 090 0	5290	453-376		
			Goldstone	089F	04 05 089 0	5589			
			Woomera	090F	05 05 090 0	5590			
			Goldstone	090F	04 05 090 0	5790			
	213W	4-8	Goldstone	089F	03 05 089 0	5089	635-606		
			Goldstone	089F	04 05 089 0	5589			
	214T	5-8	Goldstone	089F	03 05 089 0	5089	604-507		
			Goldstone	089F	04 05 089 0	5589			
	214W	5-8	Goldstone	089F	03 05 089 0	5089	766-738		
			Goldstone	089F	04 05 089 0	5589			
	215T	6-8	Goldstone	089F	03 05 089 0	5089	734-638		
			Goldstone	089F	04 05 089 0	5589			
	215W	6-8	Goldstone	089F	03 05 089 0	5089	896-869		
			Goldstone	089F	04 05 089 0	5589			
	216T	7-8	Goldstone	089F	03 05 089 0	5089	866-770		
			Goldstone	089F	04 05 089 0	5589			
	216W	7-8	Goldstone	088F	03 05 088 0	5088	028-989		
			Goldstone	088F	04 05 088 0	5588			
	217T	[illegible]	Goldstone	088F	03 05 088 0	5088	998-9[illegible]0		
			Goldstone	089F	03 05 089 0	5089	927-901		
			Goldstone	088F	04 05 088 0	[illegible]			
			Goldstone	089F	04 05 089 0	5589			
	217W	NOT READ OUT							
	218T	BLANK FINIS							
			Goldstone	088F	03 05 088 0	5088	056-029		

FARSIDE SITES

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-1a	5T	1-8	Madrid	148F	08 05 148 0	5148	168-067		
			Goldstone	002P	03 05 002 0	5002	168-067		
			Madrid	002P	08 05 002 0	5202	168-067		
			Madrid	148F	07 05 148 0	5648			
			Goldstone	002P	04 05 002 0	5502			
			Madrid	002P	07 05 002 0	5702			
	5W	1-8	Madrid	148F	08 05 148 0	5148	332-303		
			Goldstone	003P	03 05 003 0	5003	332-303		
			Madrid	148F	07 05 148 0	5648			
			Goldstone	003P	04 05 003 0	5503			
	6T	2-8	Madrid	148F	08 05 148 0	5148	299-202		
			Goldstone	003P	03 05 003 0	5003	299-284		
			Goldstone	002P	03 05 002 0	5002	289-202		
			Madrid	002P	08 05 002 0	5202	289-202		
			Madrid	148F	07 05 148 0	5648			
			Goldstone	003P	04 05 003 0	5503			
			Goldstone	002P	04 05 002 0	5502			
			Madrid	002P	07 05 002 0	5702			
	6W	2-8	Madrid	148F	08 05 148 0	5148	463-431		
			Goldstone	003P	03 05 003 0	5003	463-431		
			Madrid	148F	07 05 148 0	5648			
			Goldstone	003P	04 05 003 0	5503			
	7T	3-8	Madrid	148F	08 05 148 0	5148	432-335		
			Goldstone	003P	03 05 003 0	5003	432-335		
			Madrid	148F	07 05 148 0	5648			
			Goldstone	003P	04 05 003 0	5503			
	7W	3-8	Madrid	147F	07 05 147 0	5147	594-565		
			Madrid	147F	08 05 147 0	5647			
	8T	4-8	Madrid	147F	07 05 147 0	5147	561-499		
			Madrid	148F	08 05 148 0	5148	498-465		
			Goldstone	003P	03 05 003 0	5003	546-465		
			Madrid	147F	08 05 147 0	5647			
			Madrid	148F	07 05 148 0	5648			
			Goldstone	003P	04 05 003 0	5503			
	8W	4-8	Madrid	147F	07 05 147 0	5147	724-694		
			Madrid	147F	08 05 147 0	5647			
	9T	5-8	Madrid	147F	07 05 147 0	5147	693-597		
			Madrid	147F	08 05 147 0	5647			
	9W	5-8	Madrid	147F	07 05 147 0	5147	855-826		
			Madrid	147F	08 05 147 0	5647			
	10T	6-8	Madrid	147F	07 05 147 0	5147	825-729		
			Madrid	147F	08 05 147 0	5647			
	10W	6-8	Woomera	146F	06 05 146 0	5146	987-958		
			Madrid	146F	08 05 146 0	5346	987-958		
			Madrid	004P	08 05 004 0	5004	987-958		
			Woomera	004P	06 05 004 0	5204	987-958		
			Woomera	146F	05 05 146 0	5646			
			Madrid	146F	07 05 146 0	5846			
			Madrid	004P	07 05 004 0	5504			
			Woomera	004P	05 05 004 0	5704			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-1a	11T	7-8	Woomera	146F	06 05 146 0	5146	957-921		
			Madrid	146F	08 05 146 0	5347	957-921		
			Madrid	147F	07 05 147 0	5147	920-860		
			Madrid	004P	08 05 004 0	5004	957-950		
			Woomera	004P	06 05 004 0	5204	957-950		
			Woomera	146F	05 05 146 0	5646			
			Madrid	146F	07 05 146 0	5847			
			Madrid	147F	08 05 147 0	5647			
			Madrid	004P	07 05 004 0	5504			
			Woomera	004P	05 05 004 0	5704			
	11W	7-8	Woomera	146F	06 05 146 0	5146	118-090		
			Madrid	146F	08 05 146 0	5346	110-090		
			Madrid	004P	08 05 004 0	5004	099-090		
			Woomera	004P	06 05 004 0	5204	099-090		
			Goldstone	006P	03 05 006 0	5006	118-109		
			Woomera	146F	05 05 146 0	5646			
			Madrid	146F	07 05 146 0	5846			
			Madrid	004P	07 05 004 0	5504			
			Woomera	004P	05 05 004 0	5704			
			Goldstone	006P	04 05 006 0	5506			
	12T	8-8	Woomera	146F	06 05 146 0	5146	088-991		
			Madrid	146F	08 05 146 0	5346	088-991		
			Madrid	004P	08 05 004 0	5004	088-991		
			Woomera	004P	06 05 004 0	5204	088-991		
			Woomera	146F	05 05 146 0	5646			
			Madrid	146F	07 05 146 0	5846			
			Madrid	004P	07 05 004 0	5504			
			Woomera	004P	05 05 004 0	5704			
	12W	8-8	Woomera	146F	06 05 146 0	5146	250-221		
			Goldstone	005P	03 05 005 0	5005	250-221		
			Woomera	146F	05 05 146 0	5646			
			Goldstone	005P	04 05 005 0	5505			
V-2a	13T	1-8	Woomera	146F	06 05 146 0	5146	218-122		
			Goldstone	005P	03 05 005 0	5005	218-158		
			Goldstone	006P	03 05 006 0	5006	157-122		
			Woomera	146F	05 05 146 0	5646			
			Goldstone	005P	04 05 005 0	5505			
			Goldstone	006P	04 05 005 0	5506			
	13W	1-8	Woomera	145F	05 05 145 0	5145	379-352		
			Woomera	007P	06 05 007 0	5007	379-352		
			Goldstone	005P	03 05 005 0	5005	356-352		
			Woomera	145F	06 05 145 0	5645			
			Woomera	007P	05 05 007 0	5507			
			Goldstone	005P	04 05 005 0	5505			
	14T	2-8	Woomera	145F	05 05 145 0	5145	348-344		
			Woomera	146F	05 05 146 0	5146	343-252		
			Goldstone	005P	03 05 005 0	5005	348-252		
			Woomera	145F	06 05 145 0	5645			
			Woomera	146F	06 05 146 0	5646			
			Goldstone	005P	04 05 005 0	5505			
	14W	2-8	Woomera	145F	05 05 145 0	5145	511-483		
			Woomera	007P	06 05 007 0	5007	511-483		
			Goldstone	007P	03 05 007 0	5207	511-483		
			Woomera	145F	06 05 145 0	5645			
			Woomera	007P	05 05 007 0	5507			
			Goldstone	007P	04 05 007 0	5707			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-2a	15T	3-8	Woomera	145F	05 05 145 0	5145	480-383		
			Woomera	007P	06 05 007 0	5007	480-383		
			Goldstone	007P	03 05 007 0	5207	480-383		
			Woomera	145F	06 05 145 0	5645			
			Woomera	007P	05 05 007 0	5507			
			Goldstone	007P	04 05 007 0	5707			
	15W	3-8	Woomera	145F	05 05 145 0	5145	642-614		
			Goldstone	145F	03 05 145 0	5345	642-632		
			Woomera	007P	06 05 007 0	5007	623-614		
			Goldstone	007P	03 05 007 0	5207	623-614		
			Woomera	145F	06 05 145 0	5645			
			Goldstone	145F	04 05 145 0	5845			
			Woomera	007P	05 05 007 0	5507			
			Goldstone	007P	04 05 007 0	5707			
	16T	4-8	Woomera	145F	05 05 145 0	5145	611-515		
			Woomera	007P	06 05 007 0	5007	611-515		
			Goldstone	007P	03 05 007 0	5207	611-515		
			Woomera	145F	06 05 145 0	5645			
			Woomera	007P	05 05 007 0	5507			
			Goldstone	007P	04 05 007 0	5707			
	16W	4-8	Goldstone	144F	03 05 144 0	5144	773-744		
			Woomera	144F	06 05 144 0	5344	773-744		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
	17T	5-8	Woomera	145F	05 05 145 0	5145	743-646		
			Goldstone	145F	03 05 145 0	5345	743-646		
			Woomera	145F	06 05 145 0	5645			
			Goldstone	145F	04 05 145 0	5845			
	17W	5-8	Goldstone	144F	03 05 144 0	5144	904-876		
			Woomera	144F	06 05 144 0	5344	904-876		
			Goldstone	008P	03 05 008 0	5008	899-888		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
			Goldstone	008P	04 05 008 0	5508			
	18T	6-8	Goldstone	144F	03 05 144 0	5144	873-777		
			Woomera	144F	06 05 144 0	5344	873-777		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
	18W	6-8	Goldstone	144F	03 05 144 0	5144	039-011		
			Woomera	144F	06 05 144 0	5344	039-011		
			Goldstone	008P	03 05 008 0	5008	039-011		
			Madrid	008P	08 05 008 0	5208	039-011		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
			Goldstone	008P	04 05 008 0	5508			
			Madrid	008P	07 05 008 0	5708			
	19T	7-8	Goldstone	144F	03 05 144 0	5144	007-910		
			Woomera	144F	06 05 144 0	5344	007-910		
			Goldstone	008P	03 05 008 0	5008	007-910		
			Madrid	008P	08 05 008 0	5208	007-910		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
			Goldstone	008P	04 05 008 0	5508			
			Madrid	008P	07 05 008 0	5708			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-2a	19W	7-8	Goldstone	143F	03 05 143 0	5143	166-160		
			Goldstone	144F	03 05 144 0	5144	159-140		
			Woomera	009P	06 05 009 0	5009	166-140		
			Goldstone	008P	03 05 008 0	5008	146-140		
			Madrid	008P	08 05 008 0	5208	146-140		
			Goldstone	143F	04 05 143 0	5643			
			Goldstone	144F	04 05 144 0	5644			
			Woomera	009P	05 05 009 0	5509			
			Goldstone	008P	04 05 008 0	5508			
			Madrid	008P	07 05 008 0	5708			
	20T	8-8	Goldstone	144F	03 05 144 0	5144	138-042		
			Woomera	144F	06 05 144 0	5344	087-042		
			Goldstone	008P	03 05 008 0	5008	138-042		
			Madrid	008P	08 05 008 0	5208	138-042		
			Woomera	009P	06 05 009 0	5009	138-136		
			Goldstone	144F	04 05 144 0	5644			
			Woomera	144F	05 05 144 0	5844			
			Goldstone	008P	04 05 008 0	5508			
			Madrid	008P	07 05 008 0	5708			
			Woomera	009P	05 05 009 0	5509			
	20W	8-8	Goldstone	143F	03 05 143 0	5143	297-271		
			Woomera	009P	06 05 009 0	5009	297-271		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	009P	05 05 009 0	5509			
V-3a	21T	1-1	Goldstone	143F	03 05 143 0	5143	267-170		
			Woomera	009P	06 05 009 0	5009	267-170		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	009P	05 05 009 0	5509			
	21W	1-1	Goldstone	143F	03 05 143 0	5143	432-404		
			Woomera	010P	05 05 010 0	5010	432-404		
			Woomera	009P	06 05 009 0	5009	412-404		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	010P	06 05 010 0	5510			
			Woomera	009P	05 05 009 0	5509			
V-4a	22T	1-1	Goldstone	143F	03 05 143 0	5143	398-301		
			Woomera	009P	06 05 009 0	5009	398-301		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	009P	05 05 009 0	5509			
	22W	1-1	Goldstone	143F	03 05 143 0	5143	560-533		
			Woomera	010P	05 05 010 0	5010	560-533		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	010P	05 05 010 0	5510			
V-5a	23T	1-1	Goldstone	143F	03 05 143 0	5143	530-434		
			Woomera	010P	05 05 010 0	5010	530-434		
			Goldstone	143F	04 05 143 0	5643			
			Woomera	010P	06 05 010 0	5510			
	23W	1-1	Goldstone	142F	03 05 142 0	5142	692-663		
			Woomera	011P	05 05 011 0	5011	692-675		
			Madrid	011P	07 05 011 0	5211	692-675		
			Woomera	010P	05 05 010 0	5010	674-663		
			Goldstone	142F	04 05 142 0	5642			
			Woomera	011P	06 05 011 0	5511			
			Madrid	011P	08 05 011 0	5711			
			Woomera	010P	06 05 010 0	5510			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-6a	24T	1-1	Goldstone	142F	03 05 142 0	5142	661-599		
			Goldstone	143F	03 05 143 0	5143	598-564		
			Woomera	010P	05 05 010 0	5010	661-564		
			Goldstone	142F	04 05 142 0	5642			
			Goldstone	143F	04 05 143 0	5643			
			Woomera	010P	06 05 010 0	5510			
	24W	1-1	Goldstone	142F	03 05 142 0	5142	821-794		
			Woomera	011P	05 05 011 0	5011	821-794		
			Madrid	011P	07 05 011 0	5211	821-794		
			Goldstone	142F	04 05 142 0	5642			
			Woomera	011P	06 05 011 0	5511			
			Madrid	011P	08 05 011 0	5711			
V-7.1a	25T	1-1	Goldstone	142F	03 05 142 0	5142	791-695		
			Woomera	011P	05 05 011 0	5011	791-695		
			Madrid	011P	07 05 011 0	5211	791-695		
			Goldstone	142F	04 05 142 0	5642			
			Woomera	011P	06 05 011 0	5511			
			Madrid	011P	08 05 011 0	5711			
	25W	1-1	Madrid	141F	08 05 141 0	5141	951-934		
			Goldstone	141F	03 05 141 0	5341	951-934		
			Goldstone	142F	03 05 142 0	5142	933-924		
			Madrid	012P	08 05 012 0	5012	951-933		
			Woomera	011P	05 05 011 0	5011	937-924		
			Madrid	141F	07 05 141 0	5641			
			Goldstone	141F	04 05 141 0	5841			
			Goldstone	142F	04 05 142 0	5642			
			Madrid	012P	07 05 012 0	5512			
			Woomera	011P	06 05 011 0	5511			
V-8a	26T	1-1	Goldstone	142F	03 05 142 0	5142	922-826		
			Woomera	011P	05 05 011 0	5011	922-826		
			Madrid	011P	07 05 011 0	5211	846-826		
			Goldstone	142F	04 05 142 0	5642			
			Woomera	011P	06 05 011 0	5511			
			Madrid	011P	08 05 011 0	5711			
	26W	1-1	Madrid	141F	08 05 141 0	5141	085-056		
			Goldstone	141F	03 05 141 0	5341	085-056		
			Madrid	012P	08 05 012 0	5012	085-056		
			Madrid	141F	07 05 141 0	5641			
			Goldstone	141F	04 05 141 0	5841			
			Madrid	012P	07 05 012 0	5512			
V-10a	28T	1-1	Madrid	141F	08 05 141 0	5141	184-088		
			Goldstone	141F	03 05 141 0	5341	160-088		
			Madrid	012P	08 05 012 0	5012	184-088		
			Madrid	014P	08 05 014 0	5014	184-182		
			Goldstone	014P	03 05 014 0	5214	184-182		
			Madrid	141F	07 05 141 0	5641			
			Goldstone	141F	04 05 141 0	5841			
			Madrid	012P	07 05 012 0	5512			
			Madrid	014P	07 05 014 0	5514			
			Goldstone	014P	04 05 0140	5714			
	28W	1-1	Madrid	141F	08 05 141 0	5141	348-320		
			Madrid	013P	08 05 013 0	5013	348-320		
			Madrid	141F	07 05 141 0	5641			
			Madrid	013P	07 05 013 0	5513			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. __ OF __	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-11.2a	29T	1-1	Madrid	141F	08 05 141 0	5141	317-220		
			Madrid	013P	08 05 013 0	5013	317-270		
			Madrid	014P	08 05 014 0	5014	269-220		
			Goldstone	014P	03 05 014 0	5214	231-220		
			Madrid	141F	07 05 141 0	5641			
			Madrid	013P	07 05 013 0	5513			
			Madrid	014P	07 05 014 0	5514			
			Goldstone	014P	04 05 014 0	5714			
	29W	1-1	Madrid	140F	08 05 140 0	5140	479-450		
			Madrid	013P	08 05 013 0	5013	463-450		
			Goldstone	015P	03 05 015 0	5015	479-453		
			Madrid	140F	07 05 140 0	5640			
			Madrid	013P	07 05 130 0	5513			
			Goldstone	015P	04 05 015 0	5515			
V-12a	30T	1-1	Madrid	140F	08 05 140 0	5140	447-377		
			Madrid	141F	08 05 141 0	5141	376-350		
			Madrid	013P	08 05 013 0	5013	447-350		
			Madrid	140F	07 05 140 0	5640			
			Madrid	141F	07 05 141 0	5641			
			Madrid	013P	07 05 013 0	5513			
	30W	1-1	Madrid	140F	08 05 140 0	5140	604-583		
			Goldstone	015P	03 05 015 0	5015	604-583		
			Madrid	015P	08 05 015 0	5215	604-583		
			Madrid	140F	07 05 140 0	5640			
			Goldstone	015P	04 05 015 0	5515			
			Madrid	015P	07 05 015 0	5715			
V-13a	31T	1-1	Madrid	140F	08 05 140 0	5140	578-481		
			Goldstone	015P	03 05 015 0	5015	578-481		
			Madrid	015P	08 05 015 0	5215	578-567		
			Madrid	140F	07 05 140 0	5640			
			Goldstone	015P	04 05 015 0	5515			
			Madrid	015P	07 05 015 0	5715			
	31W	1-1	Madrid	140F	08 05 140 0	5140	739-711		
			Goldstone	016P	03 05 016 0	5016	739-725		
			Goldstone	015P	03 05 015 0	5015	725-711		
			Madrid	015P	08 05 015 0	5215	725-711		
			Madrid	140F	07 05 140 0	5640			
			Goldstone	016P	04 05 016 0	5516			
			Goldstone	015P	04 05 015 0	5515			
			Madrid	015P	07 05 015 0	5715			
V-14a	32T	1-1	Madrid	140F	08 05 140 0	5140	709-613		
			Goldstone	015P	03 05 015 0	5015	709-613		
			Madrid	015P	08 05 015 0	5215	709-613		
			Madrid	140F	07 05 140 0	5640			
			Goldstone	015P	04 05 015 0	5515			
			Madrid	015P	07 05 015 0	5715			
	32W	1-1	Madrid	139F	08 05 139 0	5139	871-842		
			Goldstone	016P	03 05 016 0	5016	871-842		
			Madrid	139F	07 05 139 0	5639			
			Goldstone	016P	04 05 016 0	5516			
V-15a	39T	1-1	Woomera	138F	05 05 138 0	5138	628-531		
			Woomera	021P	06 05 021 0	5021	628-531		
			Woomera	138F	06 05 138 0	5638			
			Woomera	021P	05 05 021 0	5521			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-15a	39W	1-1	Woomera	137F	05 05 137 0	5137	789-761		
			Woomera	020P	06 05 020 0	5020	774-761		
			Woomera	137F	06 05 137 0	5637			
			Woomera	020P	05 05 020 0	5520			
V-16.1a	43T	1-1	Goldstone	136F	03 05 136 0	5136	150-106		
			Woomera	136F	05 05 136 0	5336	150-106		
			Woomera	137F	05 05 137 0	5137	105-051		
			Goldstone	137F	03 05 137 0	5337	105-051		
			Madrid	024P	08 05 024 0	5024	150-060		
			Goldstone	136F	04 05 136 0	5636			
			Woomera	136F	06 05 136 0	5836			
			Woomera	137F	06 05 137 0	5637			
			Goldstone	137F	04 05 137 0	5837			
			Madrid	024P	07 05 024 0	5524			
	43W	1-1	Goldstone	136F	03 05 136 0	5136	315-286		
			Woomera	136F	05 05 136 0	5336	315-285		
			Madrid	023P	08 05 023 0	5023	293-285		
			Goldstone	136F	04 05 136 0	5636			
			Woomera	136F	06 05 136 0	5836			
			Madrid	023P	07 05 023 0	5523			
V-17.1a	53T	1-1	Madrid	133F	08 05 133 0	5133	466-434		
			Goldstone	133F	03 05 133 0	5333	466-434		
			Goldstone	134F	03 05 134 0	5134	433-370		
			Madrid	134F	08 05 134 0	5334	433-370		
			Goldstone	030P	03 05 030 0	5030	466-391		
			Woomera	030P	05 05 030 0	5230	466-391		
			Madrid	133F	07 05 133 0	5633			
			Goldstone	133F	04 05 133 0	5833			
			Goldstone	134F	04 05 134 0	5634			
			Madrid	134F	07 05 134 0	5834			
			Goldstone	030P	04 05 030 0	5530			
			Woomera	030P	06 05 030 0	5730			
	53W	1-1	Madrid	133F	08 05 133 0	5133	628-599		
			Goldstone	030P	03 05 030 0	5030	609-599		
			Woomera	030P	05 05 030 0	5230	609-599		
			Madrid	133F	07 05 133 0	5633			
			Goldstone	030P	04 05 030 0	5533			
			Woomera	030P	06 05 030 0	5730			
V-18.1a	65T	1-1	Woomera	130F	05 05 130 0	5130	041-945		
			Madrid	037P	08 05 037 0	5037	041-996		
			Woomera	130F	06 05 130 0	5630			
			Madrid	037P	07 05 037 0	5537			
	65W	1-1	Woomera	130F	05 05 130 0	5130	204-174		
			Madrid	036P	07 05 036 0	5036	176-174		
			Woomera	130F	06 05 130 0	5630			
			Madrid	036P	08 05 036 0	5536			
V-19a	79T	1-1	Goldstone	126F	03 05 126 0	5126	880-784		
			Madrid	126F	08 05 126 0	5326	880-784		
			Woomera	043P	05 05 043 0	5043	880-784		
			Goldstone	126F	04 05 126 0	5626			
			Madrid	126F	07 05 126 0	5826			
			Woomera	043P	06 05 043 0	5543			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-19a	79W	1-1	Madrid	125F	08 05 125 0	5125	042-024		
			Goldstone	126F	03 05 126 0	5126	023-013		
			Madrid	126F	08 05 126 0	5326	023-013		
			Madrid	044P	08 05 044 0	5044	042-031		
			Madrid	125F	07 05 125 0	5625			
			Goldstone	126F	04 05 126 0	5626			
			Madrid	126F	07 05 126 0	5826			
			Madrid	044P	07 05 044 0	5544			
V-20a	85T	1-1	Madrid	124F	08 05 124 0	5124	666-570		
			Madrid	124F	07 05 124 0	5624			
	85W	1-1	Madrid	124F	08 05 124 0	5124	828-800		
			Madrid	046P	07 05 046 0	5046	828-800		
			Goldstone	046P	03 05 046 0	5246	828-800		
			Madrid	124F	07 05 124 0	5624			
			Madrid	046P	08 05 046 0	5546			
			Goldstone	046P	04 05 046 0	5746			
V-21a	103T	1-1	Madrid	119F	08 05 119 0	5119	030-014		
			Goldstone	120F	03 05 120 0	5120	013-933		
			Goldstone	119F	03 05 119 0	5319	030-014		
			Madrid	120F	08 05 120 0	5320	013-933		
			Woomera	051P	06 05 051 0	5051	030-933		
			Madrid	119F	07 05 119 0	5619			
			Goldstone	120F	04 05 120 0	5620			
			Goldstone	119F	04 05 119 0	5819			
			Madrid	120F	07 05 120 0	5820			
			Woomera	051P	05 05 051 0	5551			
	103W	1-1	Madrid	119F	08 05 119 0	5119	192-164		
			Goldstone	119F	03 05 119 0	5319	192-164		
			Madrid	119F	07 05 119 0	5619			
			Goldstone	119F	04 05 119 0	5819			
V-22a	124T	1-1	Goldstone	114F	03 05 114 0	5114	787-691		
			Woomera	114F	06 05 114 0	5314	787-691		
			Woomera	063P	05 05 063 0	5063	787-691		
			Woomera	064P	05 05 064 0	5264	787-778		
			Woomera	065P	06 05 065 0	5265	777-698		
			Goldstone	114F	04 05 114 0	5614			
			Woomera	114F	05 05 114 0	5814			
			Woomera	063P	06 05 063 0	5563			
			Woomera	064P	06 05 064 0	5764			
			Woomera	065P	05 05 065 0	5765			
	124W	1-1	Goldstone	114F	03 05 114 0	5114	949-921		
			Woomera	064P	05 05 064 0	5064	949-921		
			Goldstone	114F	04 05 114 0	5614			
			Woomera	064P	06 05 064 0	5564			
V-23a	158T	1-1	Goldstone	105F	03 05 105 0	5105	250-154		
			Madrid	078P	08 05 078 0	5078	250-154		
			Goldstone	105F	04 05 105 0	5605			
			Madrid	078P	07 05 078 0	5578			
	158W	1-1	Goldstone	105F	03 05 105 0	5105	413-384		
			Madrid	079P	08 05 079 0	5079	413-390		
			Goldstone	079P	03 05 079 0	5279	413-390		
			Goldstone	105F	04 05 105 0	5605			
			Madrid	079P	07 05 079 0	5579			
			Goldstone	079P	04 05 079 0	5779			

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. __ OF __	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-24a	163T	1-1	Madrid	103F	08 05 103 0	5103	908-816		
			Goldstone	103F	03 05 103 0	5303	908-816		
			Goldstone	104F	03 05 104 0	5104	815-811		
			Madrid	104F	08 05 104 0	5304	815-811		
			Goldstone	080P	03 05 080 0	5080	908-811		
			Madrid	103F	07 05 103 0	5603			
			Goldstone	103F	04 05 103 0	5803			
			Goldstone	104F	04 05 104 0	5604			
			Madrid	104F	07 05 104 0	5804			
			Goldstone	080P	04 05 080 0	5580			
	163W	1-1	Madrid	103F	08 05 103 0	5103	070-042		
			Goldstone	080P	03 05 080 0	5080	070-042		
			Madrid	103F	07 05 103 0	5603			
			Goldstone	080P	04 05 080 0	5580			
V-25a	181T	1-1	Woomera	098F	06 05 098 0	5098	271-175		
			Woomera	084P	06 05 084 0	5084	271-175		
			Woomera	098F	05 05 098 0	5598			
			Woomera	084P	05 05 084 0	5584			
	181W	1-1	Woomera	098F	06 05 098 0	5098	433-404		
			Goldstone	098F	03 05 098 0	5298	433-404		
			Woomera	098F	05 05 098 0	5598			
			Goldstone	098F	04 05 098 0	5798			

EARTH

PHOTO SITE	S/C EXPOSURE NO.	PHOTO SEQUENCE NO. ___ OF ___	RECORDING DSIF	READOUT SEQUENCE	GRE ROLL NO.	K.I. NO.	FRAMELET NO.	REMARKS	
V-9a	27T	1-1	Madrid	141F	08 05 141 0	5141	049-953		
			Goldstone	141F	03 05 141 0	5341	049-953		
			Madrid	012P	08 05 012 0	5012	049-953		
			Madrid	141F	07 05 141 0	5641			
			Goldstone	141F	04 05 141 0	5841			
			Madrid	012P	07 05 012 0	5512			
	27W	1-1	Madrid	141F	08 05 141 0	5141	218-190		
			Madrid	014P	08 05 014 0	5014	218-190		
			Goldstone	014P	03 05 014 0	5214	218-190		
			Madrid	012P	08 05 012 0	5012	200-190		
			Madrid	141F	07 05 141 0	5641			
			Madrid	014P	07 05 014 0	5514			
			Goldstone	014P	04 05 014 0	5714			
			Madrid	012P	07 05 012 0	5512			

Appendix B

FPAC SUPPORTING DATA

SPACECRAFT MANEUVERS

This section lists all maneuvers performed by Lunar Orbiter V through the readout phase. Roll maneuvers usually produce "blunder points" in the doppler data stream; if not "ignored" by ODC, the applicable data should be viewed critically. The data is identified by column as follows.

Column
1 Day
2 Hour
3 Minute
4 Second
5 & 6 Items pertinent to the computer program for which the input deck is used.
7 Comment pertaining to maneuver or program input.
8 Command sequence number

213	23	18	20.0	7	360.0	$ ROLL-360 SUN ACQ.	MISS E	1C
214	00	12	31.0	8	0.01	$ PITCH .011 P+Y DRIFT TEST		2C
214	05	00	31.0	12	0.0	$ ASU		3C
214	05	30	25.0	7	360.0	$ ROLL +360 STAR MAP		4C
214	10	14	26.5	7	357.0	$ ROLL -357 STAR MAP		5C
214	14	52	30.4	7	360.0	$ ROLL -360 ANTENNA MAP	MISS E	6C
214	18	24	14.0	7	43.5	$ ROLL -43.5 TO CANOPUS	MISS E	7C
214	18	40	8.0	7	360.0	$ ROLL +360 ANTENNA MAP	MISS E	8C
214	21	10	21.0	9	0.01	$ YAP 0.01 DRIFT TEST	MISS E	9C
215	03	30	40.0	12	0.0	$ ASU FIRST MIDCOURSE		10C
215	03	57	13.0	7	0.29	$ ROM 0.29 ROLL UPDATE		11C
215	05	47	10.0	7	42.06	$ ROP 42.06		12C
215	05	49	32.0	8	29.08	$ PIP 29.08		13C
215	06	00	00.0	2	0.0	$ OPEN DEAD BAND		14C
215	06	00	24.3	3	26.1	$ VEL V=97.6 FT/SEC.		15C
215	06	01	58.0	1	0.0	$ CLOSE DEAD BAND		16C
215	06	02	41.0	8	29.08	$ PIM 29.08		17C
215	06	04	30.0	7	42.06	$ ROM 42.06		18C
215	06	06	58.0	12	0.0	$ ASU		19C
215	06	20	27.0	8	0.01	$ PIP .011 STAR 3 AXIS DRIFT NO.2		20C
216	12	15	36.0	12	0.0	$ ASU		21C
217	09	40	19.0	7	4.5	$ ROM 4.5 UPDATE		22C
217	16	35	14.0	7	19.76	$ ROM 19.76 ORBIT INJECT.		23C
217	16	36	52.0	8	76.91	$ PIM 76.91		24C
217	16	49	17.0	2	0.0	$ CDZ		25C
217	16	49	19.0	3	498.1	$ VEL V=2109.7 FT/SEC.		26C
217	16	59	0.0	1	0.0	$ CDZ*		27C
217	16	59	34.0	8	76.91	$ PIP 76.91		28C
217	17	02	58.0	7	19.76	$ ROP 19.76		29C
217	17	04	45.0	12	0.0	$ ASU		30C
217	17	50	30.0	8	40.0	$ PIP 40		31C

218	07	55	38.0	12	0.0	$ ASU	32C
218	11	11	32.0	7	66.5	$ ROP 66.45 PHOTO SITE A1	33C
218	11	14	36.0	8	176.9	$ PIM 176.95	34C
218	11	23	26.0	8	177.0	$ PIP 176.95	35C
218	11	30	06.0	7	67.4	$ ROM 67.36	36C
218	11	32	36.0	12	0.0	$ ASU	37C
218	13	24	46.0	7	20.2	$ ROP 20.2 SITE A2	38C
218	13	26	16.0	8	167.8	$ PIP 167.84	39C
218	13	34	51.0	8	167.8	$ PIM 167.84	40C
218	13	41	17.0	7	20.3	$ ROM 20.34	41C
218	13	42	0.0	12	0.0	$ ASU	42C
218	17	07	35.6	7	31.7	$ ROM 31.7	43C
218	17	09	53.6	8	170.0	$ PIP 170.0	44C
218	17	18	32.2	8	170.0	$ PIM 170.0	45C
218	17	25	3.2	7	31.4	$ ROP 31.4	46C
218	17	26	1.0	12	0.0	$ ASU	47C
219	00	26	21.0	7	21.0	$ ROM 21.0 (OVSTD) PHOTO A-4	48C
219	00	28	3.0	8	163.8	$ PIP 163.76	49C
219	00	36	20.0	8	163.8	$ PIM 163.76	50C
219	00	42	35.0	7	20.5	$ ROP 20.47	51C
219	00	44	24.0	12	0.0	$ ASU	C
219	08	28	54.0	7	63.6	$ ROM 63.56 FIRST ORBIT TRANSFER	53C
219	08	31	53.0	8	71.3	$ PIP 71.29	54C
219	08	43	49.0	2	0.0	$ OPEN DEADZONE	55C
219	08	44	13.7	3	10.78	$ VEL DELV=52.4 FT/SEC	56C
219	08	44	47.0	1	0.0	$ CLOSE DEADZONE	57C
219	08	46	10.0	8	71.2	$ PIM 71.15	58C
219	08	49	24.0	7	63.1	$ ROP 63.10	59C
219	08	52	28.0	12	0.0	$ ASU	60C
219	13	41	28.0	7	33.4	$ ROP 33.4 OVERSTORED SITE A-6	61C
219	13	43	29.0	8	171.1	$ PIP 171.08	62C

219	13	52	13.0	8	171.1	$ PIM 171.08	63C
219	13	58	45.0	7	34.0	$ ROM 34.01	64C
219	14	00	49.0	12	0.0	$ ASU	65C
219	20	39	48.0	7	66.9	$ ROP 66.9 OVERSTORED SITE A-7	66C
219	20	42	52.0	8	176.4	$ PIM 176.4	67C
219	20	51	42.0	8	176.4	$ PIP 176.4	68C
219	20	58	25.0	7	67.5	$ ROM 67.5	69C
219	21	01	41.0	12	0.0	$ ASU	70C
220	01	33	31.0	7	20.5	$ ROM 20.47 SITE A-8	71C
220	01	35	06.0	8	164.6	$ PIP 164.6 SITE A-8	72C
220	01	43	29.0	8	164.6	$ PIM 164.6 SITE A-8	73C
220	01	49	50.0	7	20.0	$ ROP 20.00 SITE A-8	74C
220	02	33	28.0	8	30.0	$ PIP 30.0 THERMAL	75C
220	08	17	08.0	12	0.0	$ ASU	76C
220	08	55	40.0	7	167.5	$ ROM 167.5 SITE A9	77C
220	09	02	12.0	8	38.5	$ PIM 38.5	78C
220	09	06	26.0	8	38.5	$ PIP 38.5	79C
220	09	08	39.0	7	166.6	$ ROP 166.3	80C
220	09	15	07.0	12	0.0	$ ASU	81C
220	14	43	07.0	7	34.0	$ ROP 34.0 SITE A10	82C
220	14	45	07.0	8	172.1	$ PIP 172.1	83C
220	14	53	46.0	8	172.1	$ PIM 172.1	84C
220	15	00	17.0	7	34.3	$ ROM 34.3	85C
220	15	02	16.0	12	0.0	$ ASU	86C
220	21	40	59.6	7	67.2	$ ROP 67.2 SITE A11	87C
220	21	44	15.0	8	177.0	$ PIM 177.0	88C
220	21	52	47.8	8	177.0	$ PIP 177.0	89C
220	21	59	37.2	7	67.9	$ ROM 67.9	90C
220	22	02	44.7	12	0.0	$ ASU	91C
221	02	35	0.0	7	19.7	$ ROM 19.75 SITE A-12	92C
221	02	36	32.0	8	165.6	$ PIP 165.63	93C

221	02	44	59.0	8	165.6	$ PIM 165.63	94C
221	02	51	21.0	7	19.3	$ ROP 19.30	95C
221	02	53	3.0	12	0.0	$ ASU	96C
221	04	52	5.0	7	84.0	$ ROM 84.01 2ND ORB TRANSFER	97C
221	04	55	52.0	8	96.8	$ PIM 96.79	98C
221	05	08	57.0	2	0.0	$ 2.0 DZ	99C
221	05	08	57.6	3	152.9	$ VEL 766.6 FPS	100C
221	05	12	49.0	1	0.0	$ 0.2 DZ	101C
221	05	13	21.0	8	96.8	$ PIP 96.79	102C
221	05	17	23.0	7	84.0	$ ROP 84.01	103C
221	05	21	16.0	12	0.0	$ ASU	104C
221	05	42	46.0	8	0.01	$ PIP 0.11 START DRIFT TEST	105C
221	09	00	32.0	12	0.0	$ ASU	106C
221	09	23	23.0	7	36.26	$ ROP 36.26 SITE A-13	107C
221	09	25	29.0	8	160.12	$ PIP 160.12	108C
221	09	33	45.0	8	160.12	$ PIM 160.12	109C
221	09	39	50.0	7	36.59	$ ROM 36.59	110C
221	09	41	14.0	8	38.0	$ PIP 38.0 THERMAL	111C
221	14	01	58.0	12	0.0	$ ASU	112C
221	14	12	28.0	8	38.0	$ PIP 38.0	113C
221	15	47	11.0	12	0.0	$ ASU	114C
221	15	49	43.0	7	31.7	$ ROP 31.7 OVERSTORE SITE A-14	115C
221	15	51	39.0	8	160.1	$ PIP 160.1	116C
221	15	58	22.0	8	160.1	$ PIM 160.1	117C
221	16	04	31.0	7	32.6	$ ROM 32.6	118C
221	16	06	31.0	8	38.0	$ PIP 38.0 THERMAL SPC	119C
221	20	13	04.0	12	0.0	$ ASU	120C
221	20	49	44.0	7	49.2	$ ROP 49.2	121C
221	20	52	16.0	8	8.85	$ PIM 8.85	122C
221	20	53	28.0	9	71.0	$ YAM 71.0	123C
221	20	59	00.0	9	81.3	$ YAP 81.3	124C

```
221  21  03  01.0   7   49.8   $ ROM  49.8                          125C
221  21  05  08.0   8   51.3   $ PIP  51.3                          126C
222  02  39  13.0  12    0.0   $ ASU                                127C
222  03  14  10.0   7   47.1   $ ROP  47.1                          128C
222  03  16  42.0   8   16.8   $ PIM  16.8                          129C
222  03  18  08.0   9   68.8   $ YAM  68.8                          130C
222  03  23  23.0   9   86.5   $ YAP  86.5                          131C
222  03  27  10.0   7   45.5   $ ROM  45.5                          132C
222  03  29  31.0   8   62.0   $ PIP  62.0                          133C
222  09  11  17.0  12    0.0   $ ASU                                134C
222  09  41  28.0   7   95.2   $ ROP 95.25 SITE - 5-3               135C
222  09  45  28.0   9    7.9   $ YAM 7.90 SITE - 5-3                136C
222  09  46  37.0   8   67.7   $ PIM 67.73 SITE - 5-3               137C
222  09  50  16.0   8   66.5   $ PIP 66.49 SITE - 5-3               138C
222  09  53  20.0   7   95.9   $ ROM 95.86 SITE - 5-3               139C
222  09  57  31.0   8    8.1   $ PIM 8.13 SITE - 5-3                140C
222  10  41  54.0  12    0.0   $ ASU                                141C
222  10  44  25.0   7   47.7   $ ROP 47.68 SITE A-15                142C
222  10  46  54.0   8  159.7   $ PIP 159.72 SITE A-15               143C
222  10  53  26.0   8  159.7   $ PIM 159.72 SITE A-15               144C
222  10  59  42.0   7   47.7   $ ROM 47.68 SITE A-15                145C
222  11  02  13.0   8   38.0   $ PIP 38.00 THERMAL                  146C
222  12  14  04.0  12    0.0   $ ASU                                147C
222  12  44  01.0   7   54.1   $ ROP 54.14 SITE 5-4                 148C
222  12  47  05.0   8    1.1   $ PIM 1.09 SITE 5-4                  149C
222  12  47  42.0   9   72.7   $ YAM 72.72 SITE 5-4                 150C
222  12  52  28.0   9   73.9   $ YAP 73.91 SITE 5-4                 151C
222  12  55  52.0   7   54.5   $ ROM 54.46 SITE 5-4                 152C
222  12  58  34.0   8   39.4   $ PIP 39.42 SITE 5-4                 153C
222  15  27  13.0  12    0.0   $ ASU                                154C
222  16  03  10.0   7   95.8   $ ROP 95.80 OVERSTORE SITE V-5.1155C
```

```
222  16  07  21.0   9   13.85   $ YAM 13.85                          156C
222  16  08  44.0   8   62.78   $ PIM 62.78                          157C
222  16  12  09.0   8   60.91   $ PIP 60.91                          158C
222  16  15  03.0   7   95.86   $ ROM 95.86                          159C
222  16  19  12.0   8   23.87   $ PIP 23.87 TO +38.0 THERMAL         160C
222  21  49  18.0  12    0.0    $ ASU                                161C
222  22  24  41.0   7   93.8    $ ROP 93.8 OVERSTORED SITE V-6       162C
222  22  28  42.0   9   16.9    $ YAM 16.88                          163C
222  22  30  11.0   8   67.4    $ PIM 67.36                          164C
222  22  35  03.0   8   65.5    $ PIP 65.53                          165C
222  22  38  07.0   7   94.5    $ ROM 94.52                          166C
222  22  42  14.0   8   20.9    $ PIP 20.92 TO 38 THERMAL            167C
223  03  12  06.1  12    0.0    $ ASU                                168C
223  03  50  12.0   7   39.9    $ ROM  39.90 SITE A-16               169C
223  03  52  31.0   8  159.9    $ PIP  159.9                         170C
223  03  59  02.0   8  159.9    $ PIM  159.9                         171C
223  04  04  11.0   7   39.3    $ ROP  39.3                          172C
223  04  07  23.4   8   38.0    $ PIP  38.0  THERMAL                 173C
223  07  25   6.1  12    0.0    $ ASU                                174C
223  07  59  39.5   7   31.2    $ ROP 31.2  SITE 5.8 A               175C
223  08  01  44.0   8   22.0    $ PIM 22                             176C
223  08  03  26.0   9   73.8    $ YAM 73.8                           177C
223  08  08  20.0   9   86.8    $ YAP 86.8                           178C
223  08  12   9.0   7   29.4    $ ROM 29.4                           179C
223  08  14   3.0   8   63.3    $ PIP 63.3                           180C
223  10  35  23.0  12    0.0    $ ASU                                181C
223  11  11  14.0   7   26.3    $ ROP 26.34  SITE 5.8B               182C
223  11  13   1.0   8    5.2    $ PIP 5.16                           183C
223  11  14   7.0   9   84.9    $ YAM 84.94                          184C
223  11  19  32.0   9   82.3    $ YAP 82.26                          185C
223  11  23   9.0   7   26.5    $ ROM 26.53                          186C
```

```
223  11  24  55.0   8   32.1   $ PIP 32.06  OFF-SUN +38 DEG   187C
223  13  50  4.0    12  0.0    $ ASU                          188C
223  14  21  24.0   7   92.4   $ ROP 92.42  SITE 5-9.1        189C
223  14  25  24.0   9   16.6   $ YAM 16.61                    190C
223  14  26  53.0   8   68.6   $ PIM 68.63                    191C
223  14  31  46.0   8   67.4   $ PIP 67.44                    192C
223  14  34  57.0   7   92.6   $ ROM 92.62                    193C
223  14  38  50.0   8   21.2   $ PIP 21.20                    194C
223  17  09  31.0   8   38.0   $ PIP 38.0 THERMAL             195C
223  18  31  35.0   7   44.9   $ ROP 44.93 SITE A-17.1        196C
223  18  33  59.0   8   164.5  $ PIP 164.53                   197C
223  18  40  48.0   8   164.5  $ PIM 164.53                   198C
223  18  47  02.0   7   45.3   $ ROM 45.25                    199C
223  18  49  32.0   8   38.0   $ PIP 38.0 THERMAL             200C
223  20  00  15.0   12  0.0    $ ASU                          201C
223  20  37  26.0   7   67.8   $ ROP 67.8 SITE V 10           202C
223  20  40  37.0   9   33.6   $ YAM 33.56                    203C
223  20  42  29.0   8   71.5   $ PIM 71.47                    204C
223  20  46  13.0   8   83.5   $ PIP 83.49                    205C
223  20  49  58.0   7   72.1   $ ROM 72.08                    206C
223  20  53  17.0   8   2.4    $ PIP 2.4 +38.0 THERMAL        207C
223  23  21  04.0   12  0.0    $ ASU                          208C
223  23  56  27.0   7   29.2   $ ROP 29.20 SITE V-11A         209C
223  23  58  16.0   8   25.5   $ PIM 25.46                    210C
223  23  59  51.0   9   73.6   $ YAM 73.58                    211C
224  00  05  22.0   9   87.2   $ YAP 87.17                    212C
224  00  09  12.0   7   26.5   $ ROM 26.47                    213C
224  00  11  03.0   8   66.5   $ PIP 66.54 TO 38.0 THERMAL    214C
224  02  33  04.0   12  0.0    $ ASU                          215C
224  03  08  12.0   7   23.3   $ ROP 23.3 OVERSTONE SITE V11-B 216C
224  03  09  53.0   8   2.9    $ PIP 2.94                     217C
```

```
224  03  10  50.0   9  85.3   $ YAM 85.33                          218C
224  06  16  31.0   9  83.9   $ YAP 83.94                          219C
224  03  20  09.0   7  24.1   $ ROM 24.1                           220C
224  03  21  54.0   8  35.4   $ PIP 35.35 TO 38.7 THERMAL          221C
224  05  43  48.0  12   0.0   $ ASU                                222C
224  06  17  45.0   7  25.8   $ ROP 25.8  SITE V-12                223C
224  06  19  42.0   8   9.8   $ PIP 9.8   SITE V-12                224C
224  06  20  51.0   9  87.1   $ YAM 87.1  SITE V-12                225C
224  06  26  13.0   9  82.2   $ YAP 82.2  SITE V-12                226C
224  06  29  48.0   7  25.8   $ ROM 25.8  SITE V-12                227C
224  06  31  35.0   8  27.2   $ PIP 27.2  SITE V-12                228C
224  08  53  48.5  12   0.0   $ ASU                                229C
224  09  27  28.0   7  93.8   $ ROP 93.8  SITE V-13                230C
224  09  31  23.0   9  18.0   $ YAM 18  SITE V-13                  231C
224  09  32  55.0   8  67.9   $ PIM 67.9  SITE V-13                232C
224  09  37  45.0   8  66.2   $ PIP 66.2  SITE V-13                233C
224  09  40  36.0   7  94.0   $ ROM 94.0  SITE V-13                234C
224  09  44  44.0   8  19.8   $ PIP 19.8  SITE V-13                235C
224  11  38  35.0  12   0.0   $ ASU                                236C
224  11  41  11.6   7  38.5   $ ROM  38.5  SITE  A-18              237C
224  11  43  23.0   8 160.2   $ PIP  160.2                         238C
224  11  50  00.6   8 160.2   $ PIM  160.2                         239C
224  11  56  12.5   7  38.5   $ ROP  38.5                          240C
224  12  03  18.5  12   0.0   $ ASU NO GAS                         241C
224  12  46  50.6   7   8.5   $ ROP 8.5 SITE 5-14                  242C
224  12  47  59.6   8  20.9   $ PIM 20.9 SITE 5-14                 243C
224  12  49  35.5   9  83.4   $ YAM 83.4 SITE 5-14                 244C
224  12  55  29.0   9  86.7   $ YAP 86.7 SITE 5-14                 245C
224  12  59  11.5   7   8.7   $ ROM 8.7 SITE 5-14                  246C
224  13  00  20.5   8  59.1   $ PIP 59.1 SITE 5-14                 247C
224  15  24  55.0  12   0.0   $ ASU                                248C
```

```
224  15  56  15.0   7   15.7    $ ROP 15.7 SITE 5-15.1
224  15  57  42.0   8   30.8    $ PIM 30.8 SITE 5-15.1
224  15  59  37.0   9   77.2    $ YAM 77.2 SITE 5-15.1
224  16  04  28.0   9   85.7    $ YAP 85.7 SITE 5-15.1
224  16  08  18.0   7   14.0    $ ROM 14.0 SITE 5-15.1
224  16  09  39.0   8   69.7    $ PIP 69.7 SITE 5-15.1
224  18  27  19.0  12    0.0    $ ASU
224  19  02  36.0   7   29.6    $ ROP SITE-5-16A
224  19  04  20.0   8   20.1    $ PIM 20.1 SITE-5-16A
224  19  05  57.0   9   75.7    $ YAM 75.7 SITE-5-16A
224  19  11  25.0   9   86.8    $ YAP 86.8 SITE-5-16A
224  19  15  11.0   7   28.1    $ ROM 28.1 SITE-5-16A
224  19  17   0.0   8   60.8    $ PIP 60.8 SITE-5-16A
224  21  38  56.0  12    0.0    $ ASU
224  22  13  43.0   7   24.71   $ ROP 24.71 SITE-5-16B
224  22  15  25.0   8    7.2    $ PIP 7.2   SITE-5-16B
224  22  16  34.0   9   86.5    $ YAM 86.5  SITE-5-16B
224  22  22  28.0   9   83.0    $ YAP 83.0  SITE-5-16B
224  22  26  10.0   7   25.5    $ ROM 25.5  SITE-5-16B
224  22  27  54.0   8   29.9    $ PIP 29.9  SITE-5-16B
225  01  05  54.0  12    0.0    $ ASU
225  01  13  32.0   8   38.0    $ PIP 38.0 THERMAL
225  02  23  28.0  12    0.0    $ ASU SITE A-19
225  02  25  58.0   7   48.0    $ ROP 48.0
225  02  28  31.0   8  162.6    $ PIP 162.62
225  02  35  20.0   8  162.6    $ PIM 162.62
225  02  41  34.0   7   48.3    $ ROM 48.25
225  02  43  50.0   8   38.0    $ PIP 38.0 THERMAL
225  07  18   0.0  12    0.0    $ ASU
225  07  47  48.0   7   24.0    $ ROP  24.0  SITE  V-18
225  07  49  32.0   8    4.1    $ PIM  4.1
```

225	07	05	35.0	9	83.0	$ YAM 83.0		280C
225	07	56	21.0	9	84.8	$ YAP 84.8		281C
225	08	00	38.0	7	25.2	$ ROM 25.2		282C
225	08	01	44.0	8	42.0	$ PIP 42.0		283C
225	10	23	31.0	12	0.0	$ ASU		284C
225	10	53	16.0	7	43.2	$ ROP 43.2	SITE V-19	285C
225	10	55	41.0	8	14.2	$ PIM 14.2		286C
225	10	57	01.0	9	73.3	$ YAM 73.3		287C
225	11	01	43.0	9	86.3	$ YAP 86.3		288C
225	11	05	28.0	7	42.0	$ ROM 42.0		289C
225	11	07	46.0	8	56.8	$ PIP 56.8		290C
225	16	57	27.0	12	0.0	$ ASU		291C
225	17	08	33.0	8	38.0	$ PIP 38.0	THERMAL	292C
225	18	18	29.0	12	0.0	$ ASU		293C
225	18	20	56.0	7	47.3	$ ROP 47.3	SITE A-20	294C
225	18	23	31.0	8	163.2	$ PIP 163.2		295C
225	18	30	20.0	8	163.2	$ PIM 163.2		296C
225	18	36	33.0	7	48.3	$ ROM 48.3		297C
225	18	39	1.0	8	38.0	$ PIP 38.0	THERMAL	298C
225	20	11	46.0	12	0.0	$ ASU		299C
225	20	42	20.0	7	7.2	$ ROM 7.16	SITE 5-21	300C
225	20	43	29.0	8	20.5	$ PIM 20.53		301C
225	20	45	1.0	9	88.8	$ YAM 88.82		302C
225	20	50	56.0	9	86.7	$ YAP 86.66		303C
225	20	54	46.0	7	5.8	$ ROP 5.76		304C
225	20	55	52.0	8	58.7	$ PIP 58.66		305C
225	23	18	0.0	12	0.0	$ ASU		306C
225	23	48	6.0	7	11.3	$ ROP 11-28	SITE 5-22	307C
225	23	49	20.0	8	27.4	$ PIM 27.42		308C
225	23	51	1.0	9	79.8	$ YAM 79.77		309C
225	23	56	47.0	9	85.3	$ YAP 85.35		310C

226	00	00	34.0	7	10.6	$ ROM 10.65	311
226	00	01	47.0	8	65.9	$ PIP 65.89	312
226	02	25	1.0	12	0.0	$ ASU	313
226	02	54	58.0	7	27.1	$ ROP 27.10 SITE 5-23.1	314
226	02	56	42.0	8	34.4	$ PIM 34.36	315
226	02	58	45.0	9	70.8	$ YAM 70.84	316
226	03	04	8.0	9	87.4	$ YAP 87.35	317
226	03	07	56.0	7	22.7	$ ROM 22.70	318
226	03	09	33.0	8	75.6	$ PIP 75.56	319
226	05	32	24.0	12	0.0	$ ASU	320
226	06	02	24.0	7	35.2	$ ROP 35.2 SITE V 24 OVERSTORE	321
226	06	04	27.0	8	19.2	$ PIM 19.2	322
226	06	05	57.0	9	74.2	$ YAM 74.2	323
226	06	11	37.0	9	87.36	$ YAP 87.36	324
226	06	15	22.0	7	33.00	$ ROM 33.33	325
226	06	17	10.0	8	61.0	$ PIP 60.99	326
226	08	52	28.0	12	0.0	$ ASU	327
226	09	28	19.0	7	85.0	$ ROP 85.0 SITE V-25	328
226	09	32	04.0	9	23.2	$ YAM 23.22	329
226	09	33	41.0	8	119.3	$ PIM 119.3	330
226	09	39	04.0	8	120.6	$ PIP 120.64	331
226	09	43	52.0	7	86.1	$ ROM 86.05	332
226	09	47	43.0	8	14.6	$ PIP 14.56 TO 38.0 THERMAL	333
226	10	13	52.0	12	0.0	$ ASU	334
226	10	16	14.0	7	48.2	$ ROP 48.2 SITE A-21	335
226	10	18	49.0	8	164.1	$ PIP 164.14	336
226	10	25	32.0	8	164.2	$ PIM 164.14	337
226	10	31	46.0	7	48.3	$ ROM 48.29	338
226	10	34	14.0	8	38.0	$ PIP 38.0 TO +38.0 THERMAL	339
226	12	04	5.0	12	0.0	$ ASU	340
226	12	33	30.0	7	5.8	$ ROP 5.8 SITE V-26.1	341

226	12	34	33.0	8	23.28	$ PIM 23.28	342C
226	12	36	17.0	9	83.08	$ YAM 83.08	343C
226	12	44	32.0	9	85.69	$ YAP 85.69	344C
226	12	48	22.0	7	6.05	$ ROM 6.05	345C
226	12	49	21.0	8	61.38	$ PIP 61.38 TO 38.0 THERMAL	346C
226	15	07	9.4	12	0.0	$ ASU	347C
226	15	37	0.5	7	31.6	$ ROP 31.6 SITE V-27A	348C
226	15	38	55.5	8	24.6	$ PIM 24.6 SITE V-27A	349C
226	15	40	31.3	9	73.3	$ YAM 73.3 SITE V-27A	350C
226	15	46	2.0	9	87.9	$ YAP 87.9 SITE V-27A	351C
226	15	49	52.0	7	29.0	$ ROM 29.0 SITE V-27A	352C
226	15	51	48.0	8	66.2	$ PIP 66.2 SITE V-27A	353C
226	18	19	48.0	12	0.0	$ ASU	354C
226	18	48	52.0	7	26.2	$ ROP 26.2 SITE V-27B	355C
226	18	50	29.0	8	3.1	$ PIP 3.1 SITE V-27B	356C
226	18	51	33.0	9	84.9	$ YAM 84.9 SITE V-27B	357C
226	18	57	13.0	9	83.3	$ YAP 83.3 SITE V-27B	358C
226	19	00	51.6	7	26.7	$ ROM 26.7 SITE V-27B	359C
226	19	02	38.0	8	34.3	$ PIP 34.3 SITE V-27B	360C
226	21	24	18.0	12	0.0	$ ASU	361C
226	21	55	23.0	7	38.6	$ ROP 38.6 SITE 5-28	362C
226	21	57	30.0	8	0.8	$ PIP 0.8 SITE 5-28	363C
226	21	58	11.0	9	80.4	$ YAM 80.4 SITE 5-28	364C
226	22	04	04.0	9	79.6	$ YAP 79.6 SITE 5-28	365C
226	22	07	47.0	7	39.3	$ ROM 39.3 SITE 5-28	366C
226	22	09	53.0	8	36.8	$ PIP 36.8 SITE 5-28	367C
227	00	44	01.0	12	0.0	$ ASU	368C
227	01	14	30.0	7	16.5	$ ROP 16.47 SITE 5-29	369C
227	01	15	53.0	8	5.7	$ PIM 5.7 SITE 5-29	370C
227	01	16	59.0	9	85.1	$ YAM 85.1 SITE 5-29	371C
227	01	22	48.0	9	86.8	$ YAP 86.8 SITE 5-29	372C

227	01	26	35.0	7	16.9	$ ROM 16.9 SITE 5-29	373C
227	01	28	02.0	8	5.9	$ PIP 5.9 SITE 5-29	374C
227	01	30	29.0	12	0.0	$ ASU NO GAS	375C
227	02	11	25.0	7	48.3	$ ROP 48.3 SITE A-22	376C
227	02	13	52.0	8	165.1	$ PIP 165.1 SITE A-22	377C
227	02	20	44.0	8	165.1	$ PIM 165.1 SITE A-22	378C
227	02	27	05.0	7	48.3	$ ROM 48.3 SITE A-22	379C
227	02	29	34.0	8	38.0	$ PIP 38 THERMAL	380C
227	03	37	58.0	12	0.0	$ ASU	381C
227	04	07	52.0	7	65.7	$ ROP 65.73 SITE 5-30	382C
227	04	11	0.0	8	4.4	$ PIM 4.4 SITE 5-30	383C
227	04	12	01.0	9	71.5	$ YAM 71.5 SITE 5-30	384C
227	04	18	17.0	9	81.0	$ YAP 81.0 SITE 5-30	385C
227	04	21	54.0	7	66.4	$ ROM 66.38 SITE 5-30	386C
227	04	24	58.0	8	48.3	$ PIP 48.3 SITE 5-30	387C
227	07	09	33.0	12	0.0	$ ASU	388C
227	07	46	57.0	7	17.0	$ ROM 16.97 SITE 5-31	389C
227	07	48	29.0	8	13.2	$ PIM 13.2 SITE 5-31	390C
227	07	49	49.0	9	93.3	$ YAM 93.3 SITE 5-31	391C
227	07	56	44.0	9	89.5	$ YAP 89.5 SITE 5-31	392C
227	08	00	35.0	7	15.7	$ ROP 15.7 SITE 5-31	393C
227	08	01	59.0	8	51.8	$ PIP 51.8 SITE 5-31	394C
227	10	15	48.0	12	0.0	$ ASU	395C
227	10	45	48.0	7	19.6	$ ROP 19.6 SITE V 32	396C
227	10	47	25.0	8	27.03	$ PIM 27.03	397C
227	10	49	09.0	9	76.74	$ YAM 76.74	398C
227	10	56	33.0	9	86.13	$ YAP 86.13	399C
227	11	00	17.0	7	17.85	$ ROM 17.85	400C
227	11	01	43.0	8	66.41	$ PIP 66.41	401C
227	16	37	6.0	12	0.0	$ ASU	402C
227	17	07	6.0	7	27.6	$ ROP 27.6 SITE V 33	403C

227	17	08	56.0	8	27.55	$ PIM 27.55	404C
227	17	10	45.0	9	73.94	$ YAW 73.94	405C
227	17	15	33.0	9	87.37	$ UAP 87.37	406C
227	17	19	18.0	7	24.18	$ ROM 24.18	407C
227	17	20	53.0	8	68.31	$ PIP 68.31 TO +38.0 DEG.	408C
227	19	44	30.0	12	0.0	$ ASU	409C
227	20	14	15.5	7	36.1	$ ROP 36.1 SITE V34	410C
227	20	16	22.0	8	12.3	$ PIM 12.3	411C
227	20	17	39.6	9	76.8	$ YAM 76.8	412C
227	20	23	05.5	9	85.6	$ YAP 85.6	413C
227	20	26	51.6	7	35.6	$ ROM 35.6	414C
227	20	28	59.1	8	52.9	$ PIP 52.9	415C
227	23	01	31.5	12	0.0	$ ASU	416C
227	23	31	37.0	7	15.0	$ ROP 15.0 SITE V35	417C
227	23	33	44.0	8	8.4	$ PIM 8.4	418C
227	23	34	21.0	9	84.6	$ YAM 84.6	419C
227	23	41	05.0	9	86.9	$ YAP 86.9	420C
227	23	44	47.0	7	15.6	$ ROM 15.6	421C
227	23	46	05.0	8	46.6	$ PIP 46.6	422C
228	02	10	48.5	12	0.0	$ ASU	423C
228	02	40	56.5	7	21.5	$ ROP 21.5 SITE 5-36	424C
228	02	42	40.0	8	0.7	$ PIM 0.7	425C
228	02	43	26.0	9	85.2	$ YAM 85.2	426C
228	02	49	9.1	9	85.4	$ YAP 85.4	427C
228	02	52	50.5	7	22.0	$ ROM 22.0	428C
228	02	54	31.3	8	38.6	$ PIP 38.6	429C
228	05	22	48.0	12	0.0	$ ASU	430C
228	05	52	31.0	7	19.6	$ ROP 19.64 SITE 5-37	431C
228	05	54	6.0	8	10.4	$ PIM 10.42	432C
228	05	55	23.0	9	82.4	$ YAM 82.40	433C
228	06	00	59.0	9	86.1	$ YAP 86.09	434C

228	06	04	48.0	7	19.6	$ ROM 19.56	435C
228	06	06	21.0	8	48.9	$ PIP 48.95	436C
228	08	37	29.0	12	0.0	$ ASU	437C
228	08	46	22.0	8	38.0	$ PIP 38.0	438C
228	09	58	54.0	12	0.0	$ ASU	439C
228	10	01	24.0	7	47.9	$ ROP 47.91	440C
228	10	03	50.0	8	166.7	$ PIP 166.73	441C
228	10	10	45.0	8	166.7	$ PIM 166.73	442C
228	10	17	6.0	7	48.3	$ ROM 48.32	443C
228	10	19	38.0	8	38.0	$ PIP 38.0	444C
228	11	48	20.0	12	0.0	$ ASU	445C
228	12	21	31.0	7	1.28	$ ROM 1.28 SITE V 38	446C
228	12	22	28.0	8	17.42	$ PIM 17.42	447C
228	12	23	54.0	9	86.34	$ YAM 86.34	448C
228	12	29	37.0	9	86.34	$ YAP 86.34	449C
228	12	34	16.0	8	55.43	$ PIP 55.43	450C
228	18	13	6.0	12	0.0	$ ASU	451C
228	18	40	30.0	8	38.0	$ PIP 38 THERMAL	452C
228	19	31	49.0	12	0.0	$ ASU	453C
228	19	34	19.0	7	47.3	$ ROP 47.3 SITE A 24	454C
228	19	36	46.0	8	167.08	$ PIP 167.08	455C
228	19	43	41.0	8	167.08	$ PIM 167.08	456C
228	19	50	0.0	7	48.40	$ ROM 48.40	457C
228	19	52	37.0	8	38.0	$ PIP 38.0	458C
229	00	27	48.5	12	0.0	$ ASU	459C
229	00	59	20.0	7	17.0	$ ROP 17.0 SITE V-40	460C
229	01	01	21.0	8	15.4	$ PIM 15.39 SITE V-40	461C
229	01	02	7.0	9	81.2	$ YAM 81.22 SITE V-40	462C
229	01	07	51.0	9	86.2	$ YAP 86.18 SITE V-40	463C
229	01	11	20.0	7	17.6	$ ROM 17.62 SITE V-40	464C
229	01	12	50.0	8	54.1	$ PIP 54.06 SITE V-40	465C

229	03	23	48.5	12	0.0	$ ASU	466C
229	03	56	24.0	7	59.1	$ ROP 59.1 SITE V-41	467C
229	03	59	16.5	8	14.3	$ PIM 14.3 SITE V-41	468C
229	04	00	37.0	9	69.8	$ YAM 69.8 SITE V-41	469C
229	04	05	22.6	9	92.4	$ YAP 92.4 SITE V-41	470C
229	04	09	24.0	7	57.0	$ ROM 57.0 SITE V-41	471C
229	04	12	11.8	8	64.3	$ PIP 64.3 SITE V-41	472C
229	06	40	48.7	12	0.0	$ ASU	473C
229	07	15	50.0	7	34.5	$ ROP 34.5 SITE V-42A	474C
229	07	17	59.0	8	19.1	$ PIM 19.1 SITE V-42A	475C
229	07	19	21.0	9	74.8	$ YAM 74.8 SITE V-42A	476C
229	07	24	58.0	9	87.7	$ YAP 87.7 SITE V-42A	477C
229	07	28	48.0	7	33.0	$ ROM 33.0 SITE V-42A	478C
229	07	30	43.0	8	63.8	$ PIP 63.8 SITE V-42A	479C
229	09	55	49.0	12	0.0	$ ASU	480C
229	10	27	05.0	7	30.1	$ ROP 30.10 SITE 5-42B	481C
229	10	29	0.0	8	4.5	$ PIP 4.52 SITE 5-42B	482C
229	10	30	0.0	9	84.5	$ YAM 84.51 SITE 5-42B	483C
229	10	35	55.0	9	81.7	$ YAP 81.71 SITE 5-42B	484C
229	10	39	33.0	7	30.6	$ ROM 30.62 SITE 5-42B	485C
229	10	41	28.0	8	35.6	$ PIP 35.56 SITE 5-42B	486C
229	13	03	59.0	12	0.0	$ ASU	487C
229	13	33	25.0	7	43.7	$ ROP 43.7 SITE 5-43.1	488C
229	13	35	48.0	8	4.1	$ PIM 4.11 SITE 5-43.1	489C
229	13	36	46.0	9	77.9	$ YAM 77.95 SITE 5-43.1	490C
229	13	43	18.0	9	81.7	$ YAP 81.70 SITE 5-43.1	491C
229	13	46	57.0	7	43.9	$ ROM 43.90 SITE 5-43.1	492C
229	13	49	18.0	8	46.4	$ PIP 46.41 SITE 5-43.1	493C
229	16	27	30.0	12	0.0	$ ASU	494C
229	16	40	31.0	8	41.0	$ PIP 41.0 THERMAL	495C
229	17	45	4.0	12	0.0	$ ASU	496C

229	17	47	34.0	7	50.9	$ ROP 50.9 SITE A-25	497C
229	17	50	16.0	8	169.7	$ PIP 169.75 SITE A-25	498C
229	17	57	22.0	8	169.7	$ PIM 169.75 SITE A-25	499C
229	18	03	45.0	7	52.4	$ ROM 52.36 SITE A-25	500C
229	18	06	26.0	8	41.0	$ PIP 41.0 THERMAL	501C
229	22	51	53.0	12	0.0	$ ASU	502C
229	23	22	45.0	7	3.2	$ ROM 3.2 SITE V 45.1	503C
229	23	23	49.0	8	21.2	$ PIM 21.17	504C
229	23	25	21.0	9	85.2	$ YAM 85.23	505C
229	23	31	11.0	9	84.4	$ YAP 84.40	506C
229	23	34	48.0	7	2.13	$ ROP 2.13	507C
229	23	35	48.0	8	62.22	$ PIM 62.22	508C
230	01	53	8.0	12	0.0	$ ASU	509C
230	02	31	06.0	7	4.6	$ ROP 4.6 SITE V-46	510C
230	02	32	06.0	8	15.76	$ PIM 15.76	511C
230	02	33	30.0	9	84.5	$ YAM 84.52	512C
230	02	40	10.0	9	86.0	$ YAP 86.00	513C
230	02	43	57.0	7	5.2	$ ROM 5.24	514C
230	02	45	02.0	8	56.8	$ PIP 56.80 TO +41.0	515C
230	08	21	48.6	12	0.0	$ ASU	516C
230	08	51	50.6	7	7.9	$ ROP 7.9 SITE V-48	517C
230	08	52	57.1	8	14.3	$ PIM 14.3	518C
230	08	54	19.2	9	83.7	$ YAM 83.7	519C
230	09	00	56.5	9	86.0	$ YAP 86.0	520C
230	09	04	41.0	7	8.9	$ ROM 8.9	521C
230	09	05	51.0	8	55.4	$ PIP 55.4 TO +41.0 O/S	522C
230	11	24	25.4	12	0.0	$ ASJ	523C
230	12	03	21.0	7	7.8	$ ROP 7.8 SITE 5-49	524C
230	12	04	0.3	8	20.3	$ PIM 20.26	525C
230	12	06	8.0	9	82.0	$ YAM 82.00	526C
230	12	11	49.0	9	84.8	$ YAP 84.83	527C

230	12	15	27.0	7	7.7	$ ROM 7.71	528C
230	12	16	36.0	8	61.4	$ PIP 61.4	529C
230	17	55	49.0	12	0.0	$ ASU	530C
230	18	26	7.0	7	4.6	$ ROP 4.59 SITE 5-50	531C
230	18	27	10.0	8	20.1	$ PIM 20.11	532C
230	18	28	34.0	9	82.8	$ YAM 82.83	533C
230	18	34	36.0	9	84.7	$ YAP 84.73	534C
230	18	38	13.0	7	5.2	$ ROM 5.22	535C
230	18	39	13.0	8	61.2	$ PIP 61.16	536C
230	21	07	4.0	12	0.0	$ ASU	537C
230	21	32	21.0	7	19.13	$ ROP 19.13 SITE V-51	538C
230	21	33	53.0	8	22.16	$ PIM 22.16	539C
230	21	35	22.0	9	77.88	$ YAM 77.88	540C
230	21	41	57.0	9	85.56	$ YAP 85.56	541C
230	21	45	39.0	7	18.33	$ ROM 18.33	542C
230	21	47	12.0	8	64.32	$ PIP 64.32	543C
231	02	43	0.0	8	11.0	$ PIM 11.0 TO 30.0 BIMAT CUT	544C
231	04	20	20.0	8	8.0	$ PIP 8.0 TO 38.0	545C
231	05	53	54.0	12	0.0	$ ASU FOR R/O UPDATES	546C
231	06	08	41.0	7	1.7	$ ROP 1.7 UPDATE	547C
231	06	12	17.0	8	38.0	$ PIP 38.0 THERMAL	548C
231	06	22	45.0	7	6.5	$ ROP 6.5 CANOPUS IN FOV	549C
231	06	59	13.0	9	4.0	$ YAP 4.0 SIGNAL	550C
232	01	43	29.0	8	3.0	$ PIM 3.0 READ OUT	551C
232	23	50	58.0	7	6.0	$ ROM 6.0 UPDATE 552	C
233	00	01	24.0	9	4.0	$ YAM 4.0 UPDATE 553	C
233	15	59	31.0	8	3.0	$ PIM 3.0 TO +38.0	554 C
234	04	44	33.0	7	5.5	$ ROM 5.5 SIGNAL	555C
234	07	57	30.0	9	6.0	$ YAM 6.0 CANOPUS	556C
235	00	02	30.2	8	3.3	$ PIM 3.3 UPDATE	557C
235	12	26	30.0	9	6.0	$ YAM 6.0 UPDATE	558C

```
    235  13   18   47.0      7    4.0       $ ROM 4.0  UPDATE                 559C
    236  01   58   16.0      8    3.0       $ PIM 3.0 UPDATE                  560C
    236  17   07   26.0      7    4.0       $ ROM 4.0 UPDATE                  561C

GASL RUN 90  GGG                                                   (1          C
VALUE DEFINITIONS                                                              C
GASL3                                                                          C
2C                                                                             C
    215  10   00   0.0       1    0.0       $ 0.2 DEAD BAND INITIALIZATION      C
    215  10   00   0.0       11   0.0       $ ROLL TO INERTIAL HOLD             C
    215  10   00   0.0       13   0.0       $ P AND YAW TO INERTIAL HOLD        C
    237  03   29   22.0      8    3.0       $ PIM 3.0 UPDATE                  562C
    237  06   39   04.0      9    6.0       $ YAM 6.0 CANOPUS UPDATE          563C
    238  08   10   39.0      8    3.1       $ PIM 3.0  UPDATE                 564C
    238  08   41   23.0      7    4.0       $ ROM 4.0  UPDATE                 565C
    238  20   01   35.0      9    5.0       $ YAM 5.0  SIG. UPDATE            566C
    239  07   33   29.0      8    11.2      $ PIP 11.2 TO 52 COOL             567C
    239  16   40   30.0      8    53.5      $ PIM 53.5 TO SUNLINE             568C
    239  16   47   28.0      12   0.0       $ ASU  FOR WDZ DRIFT TEST         569C
    239  16   53   57.0      7    8.0       $ ROM 8.0 VIEW CANOPUS            570C
    239  17   06   28.0      7    2.9       $ ROM 2.9 BETTER VIEW OF CANOPUS571C
    239  17   12   15.0      8    0.0       $ PIP .011 START WDZ DRIFT        572C
    239  17   14   29.0      2    0.0       $ OPEN DEADZONE                   573C
    239  21   06   17.0      12   0.0       $ ASU  WDZ                        574C
    239  21   10   40.0      8    52.0      $ PIP 52.0 WDZ EXT. CONF.         575C
    240  02   00   26.0      12   0.0       $            ASU                  576C
    240  03   01   52.0      8    53.0      $            PIP 53.00  WDZ       577C
300 00 00 0.0   11 0.0   $  LAST CARD                                          C
CEGASL(325) $  ZTABLE                                                          C
1.000      0.99606   0.99326   0.99221   0.99152   0.99200   $ 62 ZTABLE 4100 2 C
0.99350    0.99636   1.00012   1.00489   1.01074   1.02970   $ 62 ZTABLE 4100 3 C
1.05383    1.0649    1.0765    1.0888    1.1015    1.1148    $ 62 ZTABLE 4100 4 C
1.121      0.        0.        0.        0.        0.        $ 62 ZTABLE 4100 5 C
0.                                                           $ 62 ZTABLE 4100 6 C
    THIS IS THE LAST CARD IN THE GASL DECK                             (0       C
```

TRACKING DATA EDITING

This section contains the following information regarding Project tracking data editing with the TDPX/ODGX programs for the purpose of orbit determination through the active phases of Mission V: Benchmark F.1 and F.3 source decks; TDPX/ODGX input deck listings; data file summaries; and save-tape (B1 and B2) listings. For assistance in postmission analysis and documentation, tracking data bar charts and spacecraft maneuver lists are presented.

Launch to Injection—The ETR tracking data obtained during this mission phase were used by the DSN to determine the parking orbit and lunar injection trajectories. The data were not processed by the Project (TBC). However, the initial state vector at cislunar injection used by the Project was determined from these data.

All ETR data are on the B1 (TDPX) master file tapes for the cislunar phase. However, they were "ignored" when ODGX was run during the phase and when the "save" B2 (ODP file) tape was produced. Therefore, it will be necessary to make a new ODP file from one of the save B1 tapes if those ETR data are to be used by the ODP.

The following list contains station identity and the external-internal station numbers for the ETR stations.

Identity	External No.	Internal No.
Antigua	74	6
Ascension	79	7
Pretoria	76	9
Carnavan	83	10
Bermuda	82	11

Cislunar Phase—Angle and doppler data were received at 10- and 60-second sample rates during this mission phase. The 10-second sample rate was employed for a short period after injection and during the midcourse maneuver. Ranging data were received at various times from the following prime S-band stations.

Identity	External No.	Internal No.
Madrid	62	1
Woomera	41	4
Johannesburg (no ranging;receiving only)	51	5
Goldstone	12	12

As in Mission IV, azimuth/elevation angle constraints made it impossible for Station 51 to acquire early lock. However, 15 lines of one-way (C1) data were received from 51 starting 1 minute, 45 seconds after cislunar injection. Station 41 was first to acquire lock at 23:19:41 GMT, Day 213, approximately 14 minutes after cislunar injection.

The usefulness of the ranging unit data received throughout the cislunar phase was hampered somewhat by two factors. First, the same hardware anomaly present in Spacecraft 5's transponder was in Spacecraft 10's transponder. This anomaly made it necessary to input an extremely large correction (approximately 1×10^9 ru) via ODGX. Due to program limitations, the accuracy of the input RU correction automatically lost one significant figure. Secondly, a valid transponder delay versus transponder temperature chart could not be obtained which forced the use of average "best guess" values. Even with these anomalies present, range unit data were extremely useful in determining the quality of the orbit determinations. Station time synchronization errors, another result of range unit data, were not calculated this mission.

New tracking data formats were in use by all stations during Mission V to accommodate the doppler resolver data type. Format Number 5 was used in place of Format Number 2 as the prime format, while Format 6 was used for a

10-second sample rate and Format 7 for a 1-second sample rate.

A potential problem was solved prior to the active mission by requesting all stations never to allow the three-digit resolver field to be all zeros. TDPX would "blow up" when encountering this situation. One other software anomaly concerning the doppler resolver appeared in the Benchmark F.1 and F.3 systems and required special mission procedures. A misplaced sign in the doppler resolver correction equation resulted in the nominal error being twice as large instead of cancelled out. Permission was granted to input the necessary correction via the ODGX source deck to the F.3 system which was in use on the subprime string. Master files were created on the prime string and transferred to the subprime string via B1 tapes, where ODGX prepared ODP files for use by the ODP. When ODGX was run on the prime string, the control card "CHANGE USE NO RESOLVER CORRECTIONS" was input via the ODGX input deck. This left the resolver data with no correction at all.

Angle data were used in the first orbit determination but were ignored by ODGX after 04:00 GMT, Day 214. Their usefulness to the ODP was limited after this time because of the spacecraft trajectory.

Unlike previous missions, the VCO frequency was not placed in the range unit field of the tracking data message when ranging modulation was off. Instead, the VCO frequency used during a pass was placed in the sending station's post-track report.

Preliminary, estimated bias values on three-way doppler data were used until shortly before the midcourse maneuver when the following bias values were received from the DSN OD analyst.

Transmitting \ Receiving	12	41	62
12	–	−0.11*	+0.26
41	+0.11*	–	+0.31
62	−0.26	−0.31	–

*These values were changed to −0.08 and +0.08 instead of −0.11 and +0.11, respectively, on GMT Day 224.

All these input values and associated time spans appear in the ODGX deck listings in this Appendix.

An equipment problem at Station 41 caused the loss of 11 minutes of data shortly after initial acquisition. The data was later replayed. One hour, 17 minutes of Station 41 data was lost within a 2-hour data span just prior to the midcourse maneuver. The reasons for this lost data were: lost lock (14 minutes); attempt to zero out static phase error (9 minutes); attempt to bias the track synthesizer frequency (54 minutes).

As a whole, data quality during this mission phase was excellent. A bad data point was usually received each time a station went from "ranging modulation on" to "ranging modulation off" and vice-versa. These points were ignored via the ODGX input deck.

First-and Second-Ellipse Phases—Angle and doppler data were the only data types received during these mission phases. Ranging data were not received because of the possibility of "lost lock" caused by the added RU modulation. The variation limits surrounding the "best lock" frequency were tightly constrained when the transmitter VCO was not biased.

Angle data were "ignored" via the ODGX input deck because of their poor quality during lunar orbit. Ten-, 20-, and 60-second sample rates were used during these phases. Ten-second data were received during the first and second transfer maneuvers, 20-second data during photo readout periods, and 60-second at all other times.

The quality of the data, although still good, was much poorer than that received during the cislunar phase. Perilune, readout, and maneuver periods were the prime sources of this poor data. Only those data points that were obviously bad were "ignored" via ODGX, although roll maneuvers were usually taken out unquestioned because of the faulty data inherent in these periods.

Third Ellipse through Photo Readout – Doppler data received during this phase was poor due to the low orbit, spacecraft maneuvers, and the large amount of photo readout. Earth occultations also cut down the number of good doppler data available to the OD program. This was especially true when the occultations occurred near apolune, the orbit position yielding the highest quality data. Angle data, as in the first and second ellipse phases, were not used and no ranging data were received.

Ten, 20-, 30-, and 60-second sample rates were used during this phase. The 10- second data were received during and shortly after the second transfer maneuver. Twenty- and 30-second data were used during photo readout periods to minimize long data "gaps." A 30-second sample rate was used in lieu of a 20-second sample rate from GMT Day 225 on to minimize the "blunder points" that occur whenever ODGX is forced to average doppler data over erratic time intervals.

Also on GMT Day 225, the track synthesizer frequency bias was changed from a plus 300 Hz to a minus 300 Hz because tuning up to a +300 Hz bias sometimes resulted in tuning through the XA of Spacecrafts 5 and 8, making a "lock-up" on the wrong spacecraft possible. A minus bias was maintained through the remainder of this phase.

Data anomalies during this period were:

Day 222 – Eighteen minutes of both Stations 12 and 62 data lost due to sideband lock.

Day 223 – Ten minutes of both Stations 12 and 41 data lost due to sideband lock.

Day 224 – Eighty minutes of Station 41 data unusable due to maneuvers near perilune.

Day 225 – Fifty minutes of Station 12 data lost when wrong receiver was allowed to drop lock.

Day 227 – Thirty-six minutes of Station 41 and 25 minutes of Station 12 data lost due to bad handover.

Day 227 – Ninety minutes of Station 62 data had to be replayed because of garbled transmission.

Day 228 – Sixty minutes of Station 12 three-way data lost because of sideband lock.

TDPX AND ODGX BENCHMARK F-1 SOURCE DECKS

This section presents the TDPX/ODGX Benchmark F.1 and F.3 source decks used during Lunar Orbiter Mission V. Also included is the ODGX source deck used on the subprime computer string to fix the doppler resolver correction routine (see "Cislunar Phase" section).

```
*       DECK     TDPX
*       TDPLK1   *
FILE1=10 MICODE=(LO/TBC)
*       TDPLK2
EXTERN-1=000001000076/8
27727/=774000000000/8            $ ALLOW TR (OR DR) TO BE ZERO
34125/=13034112/8   $ ALLOW EXTRA WORD IN FORMAT NUMBER 15
34137/=13033746/8   $ ALLOW EXTRA WORD IN FORMAT NUMBER 5
34370/=35511/8      $ ALLOW EXTRA WORD IN ASSIGN NUMBER 15
34402/=35237/8      $ ALLOW EXTRA WORD IN ASSIGN NUMBER 5
37216/=1000003/8    $ CHANGE STATION 51 TO S-BAND
50666/=322000051047/8            $ ERA    REJSAV+3
50667/=-322000051103/8           $ ANA    =077777
  BAT2+6=735001007350/8      $FORMAT BY FORMAT NUMBER DC6 OCTAL
  BAT3+6=735001007350/8      $FORMAT BY FORMAT NUMBER DC6 OCTAL
BAT5-1= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
BAT5+3=430373012273/8,430100730122/8,734303730122/8,735001007350/8
BAT5+7=017302740122/8,732606330334/8,346060606060/8
BAT9= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
BAT9+4=430373012273/8,430100730122/8,734303730122/8,734301007343/8
BAT9+8=013460606060/8
BAT13=740374430273/8,012234730443/8,017301227303/8,430273012273/8
BAT13+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
BAT13+8=732606330334/8,346060606060/8
BAT15-1= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
BAT15+3=430373012273/8,430100730122/8,734303730122/8,734301007343/8
BAT15+7=017302740122/8,732606330334/8,346060606060/8
MAT1= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
MAT1+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
MAT1+8=732606330334/8,346060606060/8
MAT4= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
MAT4+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
MAT4+8=732606330334/8,346060606060/8
MAT5= 740374430273/8,012234730443/8,017301227303/8,430273012273/8
MAT5+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
MAT5+8=732606330334/8,346060606060/8
MAT12=740374430273/8,012234730443/8,017301227303/8,430273012273/8
MAT12+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
MAT12+8=732606330334/8,346060606060/8
MAT13=740374430273/8,012234730443/8,017301227303/8,430273012273/8
MAT13+4=430373012273/8,430100730122/8,734301007343/8,017302740122/8
MAT13+8=732606330334/8,346060606060/8
ASN1= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
ASN1+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8,0
ASN4= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
ASN4+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8,0
ASN5= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
ASN5+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8,0
ASN12=76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
ASN12+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8
ASN12+16=0
ASN13=76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
ASN13+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8
ASN13+16=0
BSN5-1= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
```

```
BSN5+7=76204/8,76205/8,76202/8,76201/8,76213/8,76171/8,76170/8,76211/8
BSN5+15=76210/8,0
BSN9= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
BSN9+8=76204/8,76205/8,76202/8,76201/8,76213/8,76171/8,76170/8,0
BSN13=76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
BSN13+8=76204/8,76205/8,76202/8,76201/8,76171/8,76170/8,76211/8,76210/8
BSN13+16=0
BSN15-1= 76167/8,76172/8,76177/8,76174/8,76175/8,76176/8,76200/8,76203/8
BSN15+7=76204/8,76205/8,76202/8,76201/8,76213/8,76171/8,76170/8,76211/8
BSN15+15=76210/8,0
*       END                                                          10
```

BENCHMARK F.1 ODGX SOURCE DECK (ALSO STANDARD F.3)

```
*       DECK    ODGX
*       ODGLK1  *
32464/=7400454000/8        $ TSX TO COMMON INSTEAD OF XECUTE
54000/=5500010001/8        $ SET INDICATORS FOR ALL GOOD RU
54001/=2000032013/8        $ NOW GO TO XECUTE
FILE1=10
* A     ODGLK2  B,B
* B     ODGLK1
*       WANT    A,RETURN
32464/=7400454000/8        $ TSX TO COMMON INSTEAD OF XECUTE
54000/=5500010001/8        $ SET INDICATORS FOR ALL GOOD RU
54001/=2000032013/8        $ NOW GO TO XECUTE
*       GO      A
*       END
```

BENCHMARK F.3 ODGX SOURCE DECK (DOPPLER RESOLVER CORRECTION)

```
*       DECK    ODGX
*       ODGLK1  *
32464/=7400454000/8        $ TSX TO COMMON INSTEAD OF XECUTE
54000/=5500010001/8        $ SET INDICATORS FOR ALL GOOD RU
54001/=2000032013/8        $ NOW GO TO XECUTE
FILE1=10
* A     ODGLK2  B,B
36227/=0774000000000/8          $FIX DOPPLER RESOLVER
* B     ODGLK1
*       WANT    A,RETURN
32464/=7400454000/8        $ TSX TO COMMON INSTEAD OF XECUTE
54000/=5500010001/8        $ SET INDICATORS FOR ALL GOOD RU
54001/=2000032013/8        $ NOW GO TO XECUTE
*       GO      A
*       END
```

```
*THIS IS THE ODGX DECK FOR THE CISLUNAR PHASE OF L/O MISSION 5
*THE L/O LIBRARY SAVE B2 TAPE IS 12544
*THE L/O LIBRARY SAVE B1 TAPES ARE 11728 AND 11952
*THE MASTER FILE TIME SPAN IS 223506,213 TO 184202,217,67
* DATA FROM STR STATIONS 6,7,9,10, AND 11 ARE ON THE MASTER FILE
* BUT ARE IGNORED IN THIS ODGX DECK
* ANGLES ARE IGNORED AFTER 040000,214,67 IN THIS DECK
CHANGE NEW ODP FILE
REMOVE ALL CONTROLS
CHANGE EXECUTE
IGNORE STATIONS 6,7,8,9,10,11
IGNORE ANGLES AFTER 040000,214,67 STATIONS 1,4,5,12
IGNORE CC3 FROM 002001,214,67 TO 002103,214,67 STATION 4  $ BAD PT
IGNORE CC3 AT 021902,214,67 STATION 4                     $  RU COUNTER
IGNORE C3 FROM 053001,214,67 TO 05384200,214,67 STATION 5 $ +360 ROLL
IGNORE CC3 FROM 053001,214,67 TO 054303,214,67 STATION 4  $ +360 ROLL
IGNORE C3 FROM 064202,214,67 TO 064302,214,67 STATION 4   $ BAD PT
IGNORE C3 FROM 065002,214,67 TO 065102,214,67 STATION 4   $ END OF PASS
IGNORE CC3 FROM 072301,214,67 TO 072403,214,67 STATION 1  $ BAD PT
IGNORE CC3 FROM 080901,214,67 TO 081003,214,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 083601,214,67 TO 083703,214,67 STATION 1  $RANGE MOD OFF
IGNORE CC3 FROM 093601,214,67 TO 093703,214,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 094601,214,67 TO 094703,214,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 1[illegible]1401,214,67 TO 102603,214,67 STATION 1  $ +360 ROLL
IGNORE CC3 FROM 112301,214,67 TO 112403,214,67 STATION 1  $RANGE MOD ON
IGNORE C3 FROM 131901,214,67 TO 132003,214,67 STATION 12  $ BAD PT
IGNORE CC3 FROM 135501,214,67 TO 135603,214,67 STATION 1  $RANGE MOD OFF
IGNORE CC3 FROM 135900,214,67 TO 140002,214,67 STATION 1  $ HANDOVER
IGNORE CC3 FROM 145601,214,67 TO 150303,214,67 STATION 12 $ -360 ROLL
IGNORE CC3 FROM 184101,214,67 TO 185203,214,67 STATION 12 $ +360 ROLL
IGNORE CC3 FROM 192301,214,67 TO 193003,214,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 205901,214,67 TO 210103,214,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 215701,214,67 TO 215903,214,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 225501,214,67 TO 225603,214,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 233902,214,67 TO 234102,214,67 STATION 4  $ BAD PTS
IGNORE CC3 FROM 02 1[illegible],215,67 TO 022[illegible],215,67 STATION 4  $BAD LOCK
IGNORE CC3 FROM 022401,215,67 TO 022503,215,67 STATION 4  $RANGE MOD ON
IGNORE RU FROM 022930,215,67 TO 031033,215,67 STATION 4   $ BAD PT
IGNORE FROM 033100,215,67 TO 03[illegible],215,67 STATION 4   $MISPUNCH
IGNORE CC3 FROM 040203,215,67 TO 04[illegible],215,67 STATION 4  $ BAD PT
IGNORE CC3 FROM 052001,215,67 TO 052103,215,67 STATION 4  $ BAD PT
IGNORE CC3 FROM 053600,215,67 TO 053702,215,67 STATION 4  $ BAD PT
IGNORE CC3 FROM 054701,215,67 TO 054803,215,67 STATION 4  $ BAD PT
IGNORE FROM 060200,215,67 TO 061200,215,67 STATIONS 1,4   $ M/C
IGNORE CC3 FROM 061701,215,67 TO 062003,215,67 STATION 4 $ RESET COUNTER
IGNORE CC3 FROM 065101,215,67 TO 065303,215,67 STATION 4 $ BAD PT
IGNORE CC3 FROM 090401,215,67 TO 090503,215,67 STATION 1 $ RANGE MOD ON
IGNORE CC3 FROM 093301,215,67 TO 093403,215,67 STATION 1 $ RANGE MOD OFF
IGNORE CC3 FROM 101901,215,67 TO 102003,215,67 STATION 1 $ RANGE MOD ON
IGNORE CC3 FROM 103401,215,67 TO 103503,215,67 STATION 1 $ RANGE MOD OFF
IGNORE CC3 FROM 121401,215,67 TO 121503,215,67 STATION 1 $ RANGE MOD ON
IGNORE CC3 FROM 123101,215,67 TO 123203,215,67 STATION 1 $ RANGE MOD OFF
IGNORE CC3 FROM 125001,215,67 TO 125103,215,67 STATION 1 $ BAD PT
IGNORE CC3 AT 142502,215,67 STATION 1                     $ DO
IGNORE CC3 FROM 145401,215,67 TO 145503,215,67 STATION 1 $ RANGE MOD ON
IGNORE CC3 FROM 150801,215,67 TO 150903,215,67 STATION 12 $ BAD PT
IGNORE CC3 FROM 152201,215,67 TO 152303,215,67 STATION 12 $RANGE MOD ON
IGNORE  C3 FROM 154101,215,67 TO 154303,215,67 STATION 1 $ BAD PT
IGNORE  C3 FROM 164601,215,67 TO 164803,215,67 STATION 1 $ BAD PT
IGNORE CC3 FROM 180001,215,67 TO 180103,215,67 STATION 12 $RANGE MOD OFF
```

```
IGNORE CC3 FROM 184201,215,67 TO 184403,215,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 191201,215,67 TO 191403,215,67 STATION 12 $ OO
IGNORE CC3 FROM 193501,215,67 TO 193603,215,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 203301,215,67 TO 203503,215,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 210001,215,67 TO 210103,215,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 212901,215,67 TO 213003,215,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 225401,215,67 TO 225503,215,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 002401,216,67 TO 002503,216,67 STATION 4  $RANGE MOD ON
IGNORE CC3 FROM 015601,216,67 TO 020003,216,67 STATION 4 $ BAD DATA
IGNORE CC3 FROM 022601,216,67 TO 022703,216,67 STATION 4 $ BAD PT
IGNORE CC3 FROM 030101,216,67 TO 030203,216,67 STATION 4  $RANGE MOD OFF
IGNORE CC3 FROM 074601,216,67 TO 074703,216,67 STATION 1  $ COUNT STICK
IGNORE CC3 FROM 075801,216,67 TO 075903,216,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 080901,216,67 TO 082003,216,67 STATION 1  $ FEW BAD PTS
IGNORE CC3 FROM 090001,216,67 TO 090103,216,67 STATION 1  $RANGE MOD OFF
IGNORE CC3 FROM 092101,216,67 TO 092203,216,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 121501,216,67 TO 121603,216,67 STATION 1  $ BAD PT
IGNORE CC3 FROM 134901,216,67 TO 135003,216,67 STATION 1  $ BAD PT
IGNORE C3 FROM 143401,216,67 TO 143503,216,67 STATION 12 $ BAD PT
IGNORE CC3 FROM 152101,216,67 TO 152303,216,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 180001,216,67 TO 180103,216,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 182101,216,67 TO 182303,216,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 210001,216,67 TO 210103,216,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 213601,216,67 TO 213703,216,67 STATION 12 $RANGE MOD ON
IGNORE CC3 FROM 225501,216,67 TO 225603,216,67 STATION 12 $RANGE MOD OFF
IGNORE CC3 FROM 030501,217,67 TO 030603,217,67 STATION 4  $RANGE MOD OFF
IGNORE CC3 FROM 073901,217,67 TO 074103,217,67 STATION 1  $ BAD PTS
IGNORE CC3 FROM 095101,217,67 TO 095203,217,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 102301,217,67 TO 102403,217,67 STATION 1  $RANGE MOD OFF
CHANGE EXECUTE
COUNT TIME 60 STATIONS 1,4,5,12
ADJUST RU BY -3928815.5E2 FROM 000000,214,67 TO 050000,214,67 STATION 4
ADJUST RU BY -3928815.3E2 FROM 080000,214,67 TO 140000,214,67 STATION 1
ADJUST RU BY -3928815.4E2 FROM 150000,214,67 TO 230000,214,67 STATION 12
ADJUST RU BY -3928815.3E2 FROM 010000,215,67 TO 040000,215,67 STATION 4
ADJUST RU BY -3928815.3E2 FROM 070000,215,67 TO 150000,215,67 STATION 1
ADJUST RU BY -3928815.5E2 FROM 150000,215,67 TO 230000,215,67 STATION 12
ADJUST RU BY -3928815.4E2 FROM 000000,216,67 TO 070000,216,67 STATION 4
ADJUST RU BY -3928815.3E2 FROM 080000,216,67 TO 130000,216,67 STATION 1
ADJUST RU BY -3928815.4E2 FROM 150000,216,67 TO 230000,216,67 STATION 12
ADJUST RU BY -3928815.5E2 FROM 230000,216,67 TO 060000,217,67 STATION 4
ADJUST RU BY -3928815.3E2 FROM 090000,217,67 TO 160000,217,67 STATION 1
ADJUST C3 BY +1.41 FROM 034000,214,67 TO 060000,214,67 STATION 5  $  4 XMT
ADJUST C3 BY +.290 FROM 044800,214,67 TO 055500,214,67 STATION 1  $ 41 XMT
ADJUST C3 BY +1.15 FROM 060000,214,67 TO 080500,214,67 STATION 5  $  1 XMT
ADJUST C3 BY -.340 FROM 060400,214,67 TO 065200,214,67 STATION 4  $ 62 XMT
ADJUST C3 BY -.230 FROM 130000,214,67 TO 140000,214,67 STATION 12 $ 62 XMT
ADJUST C3 BY +.240 FROM 140000,214,67 TO 160000,214,67 STATION 1  $ 12 XMT
ADJUST C3 BY -.076 FROM 213000,214,67 TO 033000,215,67 STATION 4  $ 12 XMT
ADJUST C3 BY +.076 FROM 213000,214,67 TO 033000,215,67 STATION 12 $  4 XMT
ADJUST C3 BY +.31  FROM 050000,215,67 TO 073000,215,67 STATION 1  $41 XMT
ADJUST C3 BY -.31  FROM 070000,215,67 TO 073000,215,67 STATION 4  $62 XMT
ADJUST C3 BY -.26  FROM 130000,215,67 TO 180000,215,67 STATION 12 $ 62 XM
ADJUST C3 BY +.26  FROM 130000,215,67 TO 180000,215,67 STATION 1 $ 12 XMT
ADJUST C3 BY -.11  FROM 213000,215,67 TO 041000,216,67 STATION 4 $ 12 XMT
ADJUST C3 BY +.11  FROM 213000,215,67 TO 041000,216,67 STATION 12 $41 XMT
ADJUST C3 BY +.31  FROM 060000,216,67 TO 070000,216,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31  FROM 063000,216,67 TO 080000,216,67 STATION 4 $ 62 XMT
ADJUST C3 BY -.26  FROM 130000,216,67 TO 190000,216,67 STATION 12
ADJUST C3 BY +.26  FROM 130000,216,67 TO 190000,216,67 STATION 1
```

```
ADJUST C3 BY -.11 FROM 210000,216,67 TO 010000,217,67 STATION  4 $ 12 XMT
ADJUST C3 BY +.11 FROM 210000,216,67 TO 010000,217,67 STATION 12 $ 41 XMT
ADJUST C3 BY -.31 FROM 060000,217,67 TO 080000,217, STATION 4
ADJUST C3 BY +.31 FROM 060000,217,67 TO 080000,217, STATION 1
ADJUST C3 BY -.23 FROM 130000,217,67 TO 150000,217,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 140000,217,67 TO 180000,217,67 STATION 1 $12  XMT
PASSID 01/213 AFTER 230200,213,67 STATION 5
PASSID 01/213 AFTER 231500,213,67 STATION 4
PASSID 02/214 AFTER 033800,214,67 STATION 5
PASSID 01/214 AFTER 044900,214,67 STATION 1
PASSID 01/214 AFTER 130000,214,67 STATION 12
PASSID 02/214 AFTER 215900,214,67 STATION 4
PASSID 02/215 AFTER 050300,215,67 STATION 1
PASSID 02/215 AFTER 130000,215,67 STATION 12
PASSID 03/215 AFTER 213000,215,67 STATION 4
PASSID 03/216 AFTER 055900,216,67 STATION 1
PASSID 03/216 AFTER 134300,216,67 STATION 12
PASSID 04/216 AFTER 220000,216,67 STATION 4
PASSID 04/217 AFTER 062900,217,67 STATION 1
PASSID 04/217 AFTER 135100,217,67 STATION 12
FREQ  20457100 AFTER 232300,213,67 STATION 5
FREQ  20459000 AFTER 232300,213,67 STATION 4
TRANSMITTER ON AT 232300,213,67 STATION 4
FREQ  20458500 AFTER 033800,214,67 STATION 5
FREQ  20458300 AFTER 044900,214,67 STATION 1
TRANSMITTER ON AT 060300,214,67 STATION 1
FREQ  20457900 AFTER 130000,214,67 STATION 12
TRANSMITTER ON AT 140200,214,67 STATION 12
FREQ  20457600 AFTER 215900,214,67 STATION 4
TRANSMITTER ON AT 230300,214,67 STATION 4
FREQ  20456910 AFTER 020100,215,67 STATION 4
FREQ  20455290 AFTER 035900,215,67 STATION 4
FREQ  20455650 AFTER 043300,215,67 STATION 4
FREQ  20455180 AFTER 050300,215,67 STATION 1
TRANSMITTER ON AT 070400,215,67 STATION 1
FREQ  20458700 AFTER 070600,215,67 STATION 1
FREQ  20458700 AFTER 140000,215,67 STATION 12
TRANSMITTER ON AT 150000,215,67 STATION 12
FREQ  20458700 AFTER 213000,215,67 STATION 4
TRANSMITTER ON AT 230000,215,67 STATION 4
FREQ  20458700 AFTER 055900,216,67 STATION 1
TRANSMITTER ON AT 070400,216,67 STATION 1
FREQ  20458700 AFTER 134000,216,67 STATION 12
TRANSMITTER ON AT 150000,216,67 STATION 12
FREQ  20458700 AFTER 220000,216,67 STATION 4
TRANSMITTER ON AT 230000,216,67 STATION 4
FREQ  20458700 AFTER 062900,217,67 STATION 1
TRANSMITTER ON AT 072400,217,67 STATION 1
FREQ  20458700 AFTER 135100,217,67 STATION 12
TRANSMITTER ON AT 141400,217,67 STATION 12
FREQ  20455360 AFTER 160000,217,67 STATION 1
FREQ  20454960 AFTER 150000,217,67 STATION 12
FREQ  20457600 AFTER 173500,217,67 STATION 12
FREQ  20457600 AFTER 173600,217,67 STATION 1
CHANGE EXECUTE
PRINT ALL CONTROLS
      END DATA
```

(0

```
*THIS IS THE ODG DECK FOR THE 1ST AND 2ND ELLIPSE PHASES L/O MISSION 5
*THE L/O LIBRARY SAVE B1 TAPES ARE 12601, 12581, 12558
*THE MASTER FILE TIME SPAN IS 023002,217,67 TO 115802,221,67
*THE L/O LIBRARY SAVE B2 TAPE IS 11960
*ALLANGLES ARE IGNORED AND THE DOPPLER RESOLVER IS CORRECTED
*THE DEBOOST IGNITION TIME = 217/164854.4
*THE 1ST TRANSFER IGNITION TIME = 219/084249.6
*THE 2ND TRANSFER IGNITION TIME = 221/050832.6
CHANGE NEW ODP FILE
REMOVE ALL CONTROLS
CHANGE EXECUTE
IGNORE ANGLES STATIONS 1,4,12
IGNORE CC3 FROM 030501,217,67 TO 030603,217,67 STATION 4  $RANGE MOD OFF
IGNORE CC3 FROM 073901,217,67 TO 074103,217,67 STATION 1  $ BAD PTS
IGNORE CC3 FROM 095101,217,67 TO 095203,217,67 STATION 1  $RANGE MOD ON
IGNORE CC3 FROM 102301,217,67 TO 102403,217,67 STATION 1  $RANGE MOD OFF
IGNORE CC3 FROM 165700,217,67 TO 165800,217,67 STATION 12
IGNORE C3 FROM 175200,217,67 TO 175300,217,67 STATION 1
IGNORE C3 FROM 001601,218,67 TO 001803,218,67 STATION 12
IGNORE  CC3  FROM  005500,218,67  TO 005700,218,67  STATION 4
IGNORE CC3 FROM 041001,218,67 TO 041103,218,67 STATION 4
IGNORE CC3 FROM 075501,218,67 TO 075603,218,67 STATION 1
IGNORE CC3 FROM 081801,218,67 TO 081903,218,67 STATION 4
IGNORE CC3 FROM 111030,218,67 TO 113330,218,67 STATION 1   $ SITE A-1
IGNORE CC3 FROM 132330,218,67 TO 134130,218,67 STATION 1   $ SITE A-2
IGNORE FROM 153000,218,67 TO 155000,218,67 STATIONS 1,12
IGNORE FROM 170630,218,67 TO 172530,218,67 STATIONS 1,12  $ SITE A-3
IGNORE CC3 FROM 085701,219,67 TO 085803,219,67 STATION 4 $ FREQ CHANGE
IGNORE C3 FROM 091801,219,67 TO 092003,219,67 STATION 1  $ HANDOVER
IGNORE CC3 FROM 143701,219,67 TO 143803,219,67 STATION 1
IGNORE C3 FROM 172201,219,67 TO 172243,219,67 STATION 12  $ BAD PTS
IGNORE FROM 013300,220,67 TO 015100,220,67 STATIONS 4,12  $ A-8 MANEUV.
IGNORE FROM 023301,220,67 TO 023403,220,67 STATIONS 4,12  $ PITCH
IGNORE CC3 FROM 081601,220,67 TO 081703,220,67 STATION 4  $ ASU
IGNORE FROM 085500,220,67 TO 091700,220,67 STATIONS 1,4  $ SITE A-9 MAN.
CHANGE EXECUTE
COUNT TIME 60 STATIONS 1,4,5,12
ADJUST RU BY -3928815.5E2 FROM 230000,216,67 TO 060000,217,67 STATION 4
ADJUST RU BY -3928815.3E2 FROM 090000,217,67 TO 160000,217,67 STATION 1
ADJUST C3 BY -.31 FROM 060000,217,67 TO 080000,217, STATION 4
ADJUST C3 BY +.31 FROM 060000,217,67 TO 080000,217, STATION 1
ADJUST C3 BY -.23 FROM 130000,217,67 TO 150000,217,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 140000,217,67 TO 180000,217,67 STATION 1 $12  XMT
ADJUST C3 BY +.23 FROM 140000,217,67 TO 180000,217,67 STATION 1 $12  XMT
ADJUST C3 BY +.11 FROM 223000,217,67 TO 013000,218,67 STATION 12 $ 41 XMT
ADJUST C3 BY -.11 FROM 223000,217,67 TO 013000,218,67 STATION 4  $ 12 XMT
ADJUST C3 BY +.31 FROM 053000,218,67 TO 083000,218,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31 FROM 053000,218,67 TO 083000,218,67 STATION 4 $ 62 XMT
ADJUST C3 BY +.23 FROM 140000,218,67 TO 190000,218,67 STATION 1  $12 XMT
ADJUST C3 BY -.23 FROM 140000,218,67 TO 190000,218,67 STATION 12  $ 1 XMT
ADJUST C3 BY -.11 FROM 223000,218,67 TO 020000,219,67 STATION 4  $ 12 XMT
ADJUST C3 BY +.11 FROM 223000,218,67 TO 020000,219,67 STATION 12 $ 4  XMT
ADJUST C3 BY +.31 FROM 070000,219,67 TO 100000,219,67 STATION 1  $ 41 XMT
ADJUST C3 BY -.31 FROM 070000,219,67 TO 100000,219,67 STATION 4  $ 62 XMT
ADJUST C3 BY -.23 FROM 153000,219,67 TO 200000,219,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 153000,219,67 TO 200000,219,67 STATION 1  $12 XMT
ADJUST C3 BY -.11 FROM 230000,219,67 TO 040000,220,67 STATION 4  $12 XMT
ADJUST C3 BY +.11 FROM 230000,219,67 TO 040000,220,67 STATION 12  $ 41 XMT
ADJUST C3 BY +.31 FROM 083000,220,67 TO 113000,220,67 STATION 1  $ 41 XMT
ADJUST C3 BY -.31 FROM 083000,220,67 TO 113000,220,67 STATION 4  $ 62 XMT
```

```
ADJUST C3 BY -.23 FROM 160000,220,67 TO 200000,220,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 160000,220,67 TO 200000,220,67 STATION 1  $ 12 XMT
ADJUST C3 BY -.11 FROM 010000,221,67 TO 043000,221,67 STATION 4  $12 XMT
ADJUST C3 BY +.11 FROM 010000,221,67 TO 043000,221,67 STATION 12 $41 XMT
ADJUST C3 BY +.31 FROM 093000,221,67 TO 113000,221,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31 FROM 093000,221,67 TO 113000,221,67 STATION 4 $ 62 XMT
PASSID 04/216 AFTER 220000,216,67 STATION 4
PASSID 04/217 AFTER 062900,217,67 STATION 1
PASSID 04/217 AFTER 135100,217,67 STATION 12
PASSID 05/217 AFTER 223000,217,67 STATION 4
PASSID 05/218 AFTER 053000,218,67 STATION 1
PASSID 05/218 AFTER 150000,218,67 STATION 12
PASSID 06/218 AFTER 225000,218,67 STATION 4
PASSID 06/219 AFTER 070000,219,67 STATION 1
PASSID 06/219 AFTER 153400,219,67 STATION 12
PASSID 07/219 AFTER 234300,219,67 STATION 4
PASSID 07/220 AFTER 083100,220,67 STATION 1
PASSID 07/220 AFTER 175000,220,67 STATION 12
PASSID 08/221 AFTER 230000,220,67 STATION 4
PASSID 08/221 AFTER 093000,221,67 STATION 1
FREQ  20458700 AFTER 220000,216,67 STATION 4
TRANSMITTER ON AT 230000,216,67 STATION 4
FREQ  20458700 AFTER 062900,217,67 STATION 1
TRANSMITTER ON AT 072400,217,67 STATION 1
FREQ  20458700 AFTER 135100,217,67 STATION 12
TRANSMITTER ON AT 141400,217,67 STATION 12
FREQ  20455360 AFTER 160000,217,67 STATION 1
FREQ  20454960 AFTER 160000,217,67 STATION 12
FREQ  20457600 AFTER 173600,217,67 STATION 12
FREQ  20457600 AFTER 173600,217,67 STATION 1
FREQ  20457600 AFTER 230000,217,67 STATION 4
TRANSMITTER ON AT 233400,217,67 STATION 4
FREQ  20457600 AFTER 055000,218,67 STATION 1
TRANSMITTER ON AT 065600,218,67 STATION 1
FREQ  20457900 AFTER 120000,218,67 STATION 1
FREQ  20457900 AFTER 150000,218,67 STATION 12
TRANSMITTER ON AT 155900,218,67 STATION 12
FREQ  20457900 AFTER 225000,218,67 STATION 4
TRANSMITTER ON AT 233000,218,67 STATION 4
FREQ  20454360 AFTER 081000,219,67 STATION 1  $ FOR 1ST TRANSFER
FREQ  20454840 AFTER 081000,219,67 STATION 4  $ FOR 1ST TRANSFER
FREQ  20457900 AFTER 090000,219,67 STATION 1
FREQ  20457900 AFTER 090000,219,67 STATION 4
TRANSMITTER ON AT 092300,219,67 STATION 1
FREQ  20457900 AFTER 153400,219,67 STATION 12
TRANSMITTER ON AT 173000,219,67 STATION 12
FREQ  20457900 AFTER 234300,219,67 STATION 4
TRANSMITTER ON AT 021000,220,67 STATION 4
FREQ  20457900 AFTER 083100,220,67 STATION 1
TRANSMITTER ON AT 092300,220,67 STATION 1
FREQ  20457900 AFTER 175000,220,67 STATION 12
TRANSMITTER ON AT 182000,220,67 STATION 12
FREQ  20457900 AFTER 011400,221,67 STATION 4
TRANSMITTER ON AT 022000,221,67 STATION 4
FREQ  20457900 AFTER 093000,221,67 STATION 1
TRANSMITTER ON AT 100300,221,67 STATION 1
CHANGE EXECUTE
PRINT ALL CONTROLS
      END DATA
```

10

```
*THIS IS THE ODOX DECK FOR THE 3RD ELLIPSE PHASE OF L/O MISSION 5
*THROUGH BIMAT CUT
*THE L/O LIBRARY SAVE B1 TAPES ARE 11478, 11734, AND 12624
*THE MASTER FILE TIME SPAN IS FROM 002502,221 TO 063202,231
*L/O LIBRARY SAVE B2 TAPE 12583  WAS MADE USING AN IGNORE BEFORE
* 160000,225,67 STATIONS 1,4,12 IN THIS DECK
*L/O LIBRARY SAVE B2 TAPE 11475 WAS MADE USING AN IGNORE AFTER
* 220000,225,67 STATIONS 1,4,12 IN THIS DECK
*ALL ANGLES ARE IGNORED AND THE RESOLVER CORRECTION IS IN
*THE 2ND TRANSFER IGNITION TIME = 2217050832.6
*BIMAT CUT WAS AT 042500,231,67
CHANGE NEW ODP FILE
REMOVE ALL CONTROLS
CHANGE EXECUTE
IGNORE ANGLES STATIONS 1,4,12
IGNORE CC3 FROM 154800,221,67 TO 160500,221,67 STATION 1
IGNORE CC3 FROM 174000,221,67 TO 180400,221,67 STATION 1
IGNORE CC3 FROM 214200,221,67 TO 223100,221,67 STATION 12
IGNORE CC3 FROM 223501,221,67 TO 223613,221,67 STATION 12
IGNORE CC3 AT 033210,222,67 STATION 4                    $ BAD COUNT TIM
IGNORE CC3 FROM 035100,222,67 TO 035500,222,67 STATION 4
IGNORE CC3 FROM 040900,222,67 TO 041130,222,67 STATION 4
IGNORE CC3 FROM 042411,222,67 TO 042433,222,67 STATION 4  $
IGNORE CC3 FROM 044551,222,67 TO 044613,222,67 STATION 4  $
IGNORE CC3 FROM 045900,222,67 TO 050100,222,67 STATION 4
IGNORE CC3 FROM 050551,222,67 TO 050613,222,67 STATION 4  $
IGNORE CC3 FROM 050851,222,67 TO 050913,222,67 STATION 4  $
IGNORE CC3 FROM 051300,222,67 TO 051800,222,67 STATION 4
IGNORE FROM 091000,222,67 TO 091300,222,67 STATIONS 4
IGNORE CC3 FROM 094100,222,67 TO 100003,222,67 STATION 4
IGNORE CC3 FROM 104400,222,67 TO 104903,222,67 STATION 4
IGNORE CC3 FROM 105501,222,67 TO 105603,222,67 STATION 4
IGNORE CC3 FROM 105910,222,67 TO 110403,222,67 STATION 4
IGNORE CC3 FROM 114701,222,67 TO 115003,222,67 STATION 1
IGNORE CC3 FROM 124400,222,67 TO 124903,222,67 STATION 1
IGNORE CC3 FROM 125500,222,67 TO 130703,222,67 STATION 1
IGNORE CC3 FROM 194711,222,67 TO 194813,222,67 STATION 1
IGNORE FROM 203200,222,67 TO 205000,222,67 STATIONS 1,12 $ XMITTER OUT
IGNORE CC3 FROM 223301,222,67 TO 223503,222,67 STATION 12
IGNORE CC3 FROM 014500,223,67 TO 020500,223,67 STATION 12
IGNORE FROM 035000,223,67 TO 041500,223,67 STATIONS 4,12
IGNORE CC3 FROM 045201,223,67 TO 045513,223,67 STATION 12
IGNORE CC3 FROM 050500,223,67 TO 051000,223,67 STATION 4
IGNORE CC3 FROM 052900,223,67 TO 053900,223,67 STATION 4
IGNORE CC3 FROM 055900,223,67 TO 060003,223,67 STATION 4
IGNORE CC3 FROM 060700,223,67 TO 060803,223,67 STATION 4
IGNORE CC3 FROM 075900,223,67 TO 082003,223,67 STATION 4 $ ROLL SITE5.8A
IGNORE CC3 FROM 083301,223,67 TO 083403,223,67 STATION 4
IGNORE CC3 FROM 090001,223,67 TO 090103,223,67 STATION 4
IGNORE CC3 FROM 092801,223,67 TO 092803,223,67 STATION 4
IGNORE CC3 FROM 095501,223,67 TO 095603,223,67 STATION 4
IGNORE CC3 FROM 111100,223,67 TO 113203,223,67 STATION 4 $ ROLL SITE5.8B
IGNORE C3 FROM 123101,223,67 TO 123203,223,67 STATION 1
IGNORE C3 FROM 125001,223,67 TO 125103,223,67 STATION 1
IGNORE CC3 FROM 142100,223,67 TO 144003,223,67 STATION 1 $ROLLS/SITE5-91
IGNORE CC3 FROM 161101,223,67 TO 161203,223,67 STATION 1
IGNORE CC3 FROM 183100,223,67 TO 184003,223,67 STATION 1 $ROLL/SITEA17.1
IGNORE CC3 FROM 184700,223,67 TO 185603,223,67 STATION 1 $ROLL/SITEA17.1
IGNORE CC3 FROM 191701,223,67 TO 191803,223,67 STATION 1
IGNORE C3 FROM 193901,223,67 TO 194103,223,67 STATION 12
```

```
IGNORE FROM 203701,223,67 TO 210000,223,67 STATIONS 1,12 $SITE V-10
IGNORE CC3 FROM 222001,223,67 TO 223300,223,67 STATION 12
IGNORE CC3 FROM 235601,223,67 TO 003000,224,67 STATION 12 $SITE 11-A
IGNORE CC3 FROM 012400,224,67 TO 012800,224,67 STATION 12
IGNORE FROM 030800,224,67 TO 032300,224,67 STATION 12
IGNORE CC3 FROM 040600,224,67 TO 040800,224,67 STATION 4
IGNORE FROM 043000,224,67 TO 043600,224,67 STATIONS 4,12
IGNORE CC3 FROM 050000,224,67 TO 050500,224,67 STATION 12
IGNORE FROM 061700,224,67 TO 063300,224,67 STATION 4    $   SITE  V - 12
IGNORE CC3 FROM 065122,224,67 TO 065500,224,67 STATION 4
IGNORE CC3 FROM 083932,224,67 TO 084232,224,67 STATION 4
IGNORE CC3 FROM 092600,224,67 TO 094500,224,67 STATION 4  $   SITE  V - 13
IGNORE CC3 FROM 095631,224,67 TO 095755,224,67 STATION 4
IGNORE CC3 FROM 100122,224,67 TO 100722,224,67 STATION 4
IGNORE CC3 FROM 114300,224,67 TO 115700,224,67 STATION 4    $  SITE  A - 18
IGNORE CC3 FROM 124500,224,67 TO 130403,224,67 STATION 4    $  V - 14
IGNORE CC3 FROM 135601,224,67 TO 135603,224,67 STATION 4
IGNORE CC3 FROM 152401,224,67 TO 152603,224,67 STATION 1
IGNORE CC3 FROM 155801,224,67 TO 170003,224,67 STATION 1
IGNORE CC3 FROM 170701,224,67 TO 171233,224,67 STATION 1
IGNORE CC3 FROM 180601,224,67 TO 180803,224,67 STATION 1
IGNORE CC3 FROM 190401,224,67 TO 191003,224,67 STATION 1
IGNORE CC3 FROM 192001,224,67 TO 192303,224,67 STATION 1
IGNORE CC3 FROM 211801,224,67 TO 212003,224,67 STATION 12
IGNORE CC3 FROM 213801,224,67 TO 213903,224,67 STATION 1
IGNORE CC3 FROM 215701,224,67 TO 215803,224,67 STATION 12
IGNORE FROM 221300,224,67 TO 223000,224,67 STATIONS 4,12    $  SITE  V-16B
IGNORE CC3 FROM 225801,224,67 TO 230003,224,67 STATION 12
IGNORE CC3 FROM 232801,224,67 TO 233103,224,67 STATION 12
IGNORE CC3 FROM 013100,225,67 TO 022303,225,67 STATION 12 $R/O-12 GOOF
IGNORE FROM 022500,225,67 TO 024500,225,67 STATIONS 4,12  $  SITE  A-19
IGNORE FROM 051700,225,67 TO 052000,225,67 STATION 12
IGNORE FROM 074700,225,67 TO 080200,225,67 STATIONS 4,12  $  SITE  V-18
IGNORE FROM 081400,225,67 TO 081500,225,67 STATION 4
IGNORE FROM 081900,225,67 TO 082000,225,67 STATION 4
IGNORE FROM 083000,225,67 TO 083600,225,67 STATION 4
IGNORE FROM 085100,225,67 TO 085300,225,67 STATION 4
IGNORE CC3 FROM 110302,225,67 TO 110402,225,67 STATION 4
IGNORE CC3 FROM 110832,225,67 TO 111242,225,67 STATION 4
IGNORE CC3 FROM 224501,225,67 TO 225103,225,67 STATION 1
IGNORE CC3 FROM 225331,225,67 TO 225433,225,67 STATION 12
IGNORE CC3 FROM 035601,226,67 TO 035733,226,67 STATION 12
IGNORE CC3 FROM 040801,226,67 TO 040903,226,67 STATION 12
IGNORE CC3 FROM 061031,226,67 TO 061103,226,67 STATION 4
IGNORE FROM 061801,226,67 TO 062103,226,67 STATIONS 4,12
IGNORE CC3 FROM 063401,226,67 TO 064133,226,67 STATION 4
IGNORE CC3 FROM 082201,226,67 TO 082433,226,67 STATION 4
IGNORE CC3 FROM 093901,226,67 TO 094033,226,67 STATION 4
IGNORE CC3 FROM 094501,226,67 TO 094733,226,67 STATION 4
IGNORE CC3 FROM 101531,226,67 TO 101703,226,67 STATION 4
IGNORE FROM 123300,226,67 TO 125500,226,67 STATION 4
IGNORE FROM 153700,226,67 TO 153500,226,67 STATION 4
IGNORE CC3 FROM 230201,226,67 TO 230303,226,67 STATION 1
IGNORE CC3 FROM 231701,226,67 TO 231803,226,67 STATION 12
IGNORE CC3 FROM 011401,227,67 TO 011903,227,67 STATION 12
IGNORE CC3 FROM 042401,227,67 TO 043103,227,67 STATION 12
IGNORE CC3 FROM 054001,227,67 TO 054103,227,67 STATION 4
IGNORE CC3 FROM 080201,227,67 TO 080303,227,67 STATION 4
IGNORE CC3 FROM 094931,227,67 TO 095033,227,67 STATION 4
IGNORE CC3 FROM 173601,227,67 TO 173946,227,67 STATION 1
```

```
IGNORE CC3 FROM 234631,228,67 TO 234733,228,67 STATION 1
IGNORE C3 FROM 004401,228,67 TO 004503,228,67 STATION 1
IGNORE CC3 FROM 014901,228,67 TO 015103,228,67 STATION 12
IGNORE CC3 FROM 025901,228,67 TO 030003,228,67 STATION 12
IGNORE CC3 FROM 050321,228,67 TO 050423,228,67 STATION 12
IGNORE CC3 FROM 055601,228,67 TO 055703,228,67 STATION 12
IGNORE CC3 FROM 060901,228,67 TO 061003,228,67 STATION 12
IGNORE CC3 FROM 075931,228,67 TO 081053,228,67 STATION 4
IGNORE C3 FROM 080000,228,67 TO 085000,228,67 STATION 12  $ SIDE BAND
IGNORE CC3 FROM 082301,228,67 TO 082503,228,67 STATION 4
IGNORE CC3 FROM 091801,228,67 TO 092003,228,67 STATION 4
IGNORE CC3 FROM 094001,228,67 TO 094203,228,67 STATION 4
IGNORE CC3 FROM 123601,228,67 TO 123803,228,67 STATION 4
IGNORE CC3 FROM 134301,228,67 TO 134903,228,67 STATION 4
IGNORE CC3 FROM 150201,228,67 TO 150303,228,67 STATION 4
IGNORE CC3 FROM 153501,228,67 TO 153703,228,67 STATION 4
IGNORE FROM 193400,228,67 TO 195400,228,67 STATIONS 1,4        $  A-24
IGNORE C3 FROM 005301,229,67 TO 005503,229,67 STATION 12
IGNORE FROM 010100,229,67 TO 011400,229,67 STATIONS 1,12   $  V-40
IGNORE FROM 035600,229,67 TO 041503,229,67 STATION 12      $  V-41
IGNORE CC3 FROM 072801,229,67 TO 072903,229,67 STATION 12
IGNORE CC3 FROM 091731,229,67 TO 091833,229,67 STATION 12
IGNORE CC3 FROM 092701,229,67 TO 092903,229,67 STATION 12
IGNORE CC3 FROM 120301,229,67 TO 120403,229,67 STATION 4
IGNORE CC3 FROM 124601,229,67 TO 124703,229,67 STATION 4
IGNORE CC3 FROM 135001,229,67 TO 135553,229,67 STATION 4
IGNORE CC3 FROM 151921,229,67 TO 152023,229,67 STATION 4
IGNORE CC3 FROM 154031,229,67 TO 154153,229,67 STATION 4
IGNORE CC3 AT 155727,229,67 STATION 4
IGNORE CC3 FROM 162301,229,67 TO 162603,229,67 STATION 4
IGNORE CC3 FROM 171521,229,67 TO 171623,229,67 STATION 4
IGNORE CC3 FROM 191201,229,67 TO 191303,229,67 STATION 1
IGNORE CC3 FROM 232501,229,67 TO 232603,229,67 STATION 1
IGNORE CC3 FROM 013731,230,67 TO 014133,230,67 STATION 12
IGNORE CC3 FROM 014301,230,67 TO 014403,230,67 STATION 1
IGNORE CC3 FROM 035001,230,67 TO 035203,230,67 STATION 12
IGNORE C3 FROM 090201,230,67 TO 090403,230,67 STATION 4
IGNORE CC3 FROM 092201,230,67 TO 092303,230,67 STATION 4
IGNORE C3 FROM 092301,230,67 TO 092403,230,67 STATION 12
IGNORE CC3 FROM 175101,230,67 TO 175203,230,67 STATION 4
IGNORE C3 FROM 191701,230,67 TO 192003,230,67 STATION 1
IGNORE CC3 FROM 214301,230,67 TO 214403,230,67 STATION 1
IGNORE CC3 FROM 230101,230,67 TO 230303,230,67 STATION 1
IGNORE CC3 FROM 231201,230,67 TO 231403,230,67 STATION 1
IGNORE CC3 FROM 235101,230,67 TO 235303,230,67 STATION 1
IGNORE CC3 FROM 001301,231,67 TO 001503,231,67 STATION 1
CHANGE EXECUTE
COUNT TIME 60 STATIONS 1,4,12
ADJUST C3 BY -.11 FROM 010000,221,67 TO 043000,221,67 STATION 4  $12 XMT
ADJUST C3 BY +.11 FROM 010000,221,67 TO 043000,221,67 STATION 12 $41 XMT
ADJUST C3 BY +.31 FROM 093000,221,67 TO 113000,221,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31 FROM 093000,221,67 TO 113000,221,67 STATION 4 $ 62 XMT
ADJUST C3 BY +.23 FROM 183000,221,67 TO 233300,221,67 STATION 1  $ 12 XMT
ADJUST C3 BY -.23 FROM 183000,221,67 TO 233300,221,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.08 FROM 020000,222,67 TO 043000,222,67 STATION 12  $ 4 XMT
ADJUST C3 BY -.08 FROM 020000,222,67 TO 043000,222,67 STATION 4   $ 12 XMT
ADJUST C3 BY +.31 FROM 110000,222,67 TO 123000,222,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31 FROM 110000,222,67 TO 123000,222,67 STATION 4 $ 62 XMT
ADJUST C3 BY -.23 FROM 180000,222,67 TO 220000,222,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 180000,222,67 TO 220000,222,67 STATION 1  $12 XMT
```

```
ADJUST C3 BY +.08 FROM 033000,223,67 TO 053000,223,67 STATION 12  $ 41 XMT
ADJUST C3 BY -.08 FROM 033000,223,67 TO 053000,223,67 STATION 4  $  12 XMT
ADJUST C3 BY +.31 FROM 113000,223,67 TO 143000,223,67 STATION 1 $ 41 XMT
ADJUST C3 BY -.31 FROM 113000,223,67 TO 143000,223,67 STATION 4 $ 62 XMT
ADJUST C3 BY -.23 FROM 193000,223,67 TO 223000,223,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 193000,223,67 TO 223000,223,67 STATION 1  $12 XMT
ADJUST C3 BY -.08 FROM 033000,224,67 TO 063000,224,67 STATION 4 $12 XMT
ADJUST C3 BY +.08 FROM 033000,224,67 TO 063000,224,67 STATION 12 $41 XMT
ADJUST C3 BY -.23 FROM 213000,224,67 TO 233000,224,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 213000,224,67 TO 233000,224,67 STATION 1  $ 12 XMT
ADJUST C3 BY -.08 FROM 043000,225,67 TO 063000,225,67 STATION 4 $12 XMT
ADJUST C3 BY +.31 FROM 143000,225,67 TO 153000,225,67 STATION 1   $  41 XMT
ADJUST C3 BY -.31 FROM 143000,225,67 TO 153000,225,67 STATION 4    $  62 XMT
ADJUST C3 BY +.08 FROM 051000,226,67 TO 070500,226,67 STATION 12 $  4 XMT
ADJUST C3 BY +.31 FROM 150000,226,67 TO 160000,226,67 STATION 1  $  41 XMT
ADJUST C3 BY -.31 FROM 150000,226,67 TO 160000,226,67 STATION 4  $  61 XMT
ADJUST C3 BY -.23 FROM 223000,226,67 TO 233000,226,67 STATION 12 $ 62 TRANSMIT
ADJUST C3 BY +.11 FROM 043000,227,67 TO 080000,227,67 STATION 12 $ 41 XMT
ADJUST C3 BY +.31 FROM 163000,227,67 TO 173000,227,67 STATION 1  $ 41 XMT
ADJUST C3 BY -.31 FROM 163000,227,67 TO 173000,227,67 STATION 4  $ 62 XMT
ADJUST C3 BY -.23 FROM 230000,227,67 TO 010000,228,67 STATION 12   $  62 XMT
ADJUST C3 BY +.31 FROM 173000,228,67 TO 183000,228,67 STATION 1 $41 XMT
ADJUST C3 BY +.23 FROM 003000,229,67 TO 020000,229,67 STATION 1  $12 XMT
ADJUST C3 BY -.23 FROM 003000,229,67 TO 020000,229,67 STATION 12  $  62XMT
ADJUST C3 BY -.11 FROM 080000,229,67 TO 100000,229,67 STATION 4  $ 12 XMT
ADJUST C3 BY +.11 FROM 080000,229,67 TO 100000,229,67 STATION 12 $ 41 XMT
ADJUST C3 BY +.31 FROM 183000,229,67 TO 193000,229,67 STATION 1 $41 XMT
ADJUST C3 BY -.31 FROM 183000,229,67 TO 193000,229,67 STATION 4 $62 XMT
ADJUST C3 BY -.23 FROM 010000,230,67 TO 030000,230,67 STATION 12 $62 XMT
ADJUST C3 BY +.23 FROM 010000,230,67 TO 090000,230,67 STATION 1 $12 XMT
ADJUST C3 BY -.11 FROM 080000,230,67 TO 120000,230,67 STATION 4  $ 12 XMT
ADJUST C3 BY +.11 FROM 080000,230,67 TO 120000,230,67 STATION 12  $ 41 XMT
ADJUST C3 BY +.31 FROM 191000,230,67 TO 200000,230,67 STATION 1 $ 41 XMT
ADJUST C3 BY +.23 FROM 020000,231,67 TO 050000,231,67 STATION 1  $ 12 XMT
ADJUST C3 BY -.23 FROM 020000,231,67 TO 050000,231,67 STATION 12  $ 62 XMT
PASSID 07/220 AFTER 175000,220,67 STATION 12
PASSID 08/221 AFTER 011400,221,67 STATION 4
PASSID 09/221 AFTER 093000,221,67 STATION 1
PASSID 08/221 AFTER 183000,221,67 STATION 12
PASSID 09/222 AFTER 022500,222,67 STATION 4
PASSID 09/222 AFTER 112000,222,67 STATION 1
PASSID 09/222 AFTER 182000,222,67 STATION 12
PASSID 10/223 AFTER 035000,223,67 STATION 4
PASSID 10/223  AFTER 122000,223,67 STATION 1
PASSID 10/223 AFTER 192200,223,67 STATION 12
PASSID 11/224 AFTER 034000,224,67 STATION 4
PASSID 11/224  AFTER 135000,224,67 STATION 1
PASSID 11/224 AFTER 211800,224,67 STATION 12
PASSID 12/225 AFTER 042900,225,67 STATION 4
PASSID 12/225 AFTER 142500,225,67 STATION 1
PASSID 12/225 AFTER 224500,225,67 STATION 12
PASSID 13/225 AFTER 051000,226,67 STATION 4
PASSID 13/226 AFTER 154000,226,67 STATION 1
PASSID 13/226  AFTER 225300,226,67 STATION 12
PASSID 14/227  AFTER 043000,227,67 STATION 4
PASSID 14/227 AFTER 165000,227,67 STATION 1
PASSID 14/227 AFTER 235000,227,67 STATION 12
PASSID 15/228 AFTER 060000,228,67 STATION 4
PASSID 15/228 AFTER 175000,228,67 STATION 1
PASSID 15/229 AFTER 004000,229,67 STATION 12
```

```
PASSID  16/229 AFTER 083100,229,67 STATION 4
PASSID 16/229 AFTER 183400,229,67 STATION 1
PASSID 16/230 AFTER 013700,230,67 STATION 12
PASSID 17/230 AFTER 083600,230,67 STATION 4
PASSID 17/230  AFTER 191100,230,67 STATION 1
PASSID 17/231 AFTER 021200,231,67 STATION 12
FREQ  20457900 AFTER 175000,220,67 STATION 12
TRANSMITTER ON AT 182000,220,67 STATION 12
FREQ  20457900 AFTER 011400,221,67 STATION 4
TRANSMITTER ON AT 022000,221,67 STATION 4
FREQ  20457900 AFTER 093000,221,67 STATION 1
TRANSMITTER ON AT 100100,221,67 STATION 1
FREQ  20457900 AFTER 183000,221,67 STATION 12
TRANSMITTER ON AT 191500,221,67 STATION 12
FREQ  20457900 AFTER 022000,222,67 STATION 4
TRANSMITTER ON AT 025000,222,67 STATION 4
FREQ  20457900 AFTER 112000,222,67 STATION 1
TRANSMITTER ON AT 115100,222,67 STATION 1
FREQ  20457900 AFTER 182000,222,67 STATION 12
TRANSMITTER ON AT 191400,222,67 STATION 12
FREQ  20457900 AFTER 035000,223,67 STATION 4
TRANSMITTER ON AT 041500,223,67 STATION 4
FREQ  20457900 AFTER 122000,223,67 STATION 1
TRANSMITTER ON AT 132000,223,67 STATION 1
FREQ  20457900 AFTER 192200,223,67 STATION 12
TRANSMITTER ON AT 212200,223,67 STATION 12
FREQ  20457900 AFTER 034000,224,67 STATION 4
TRANSMITTER ON AT 050000,224,67 STATION 4
FREQ  20457900 AFTER 135000,224,67 STATION 1
TRANSMITTER ON AT 143000,224,67 STATION 1
FREQ  20457900 AFTER 211800,224,67 STATION 12
TRANSMITTER ON AT 211800,224,67 STATION 12
FREQ  20457600 AFTER 215830,224,67 STATION 1
FREQ  20457600 AFTER 215830,224,67 STATION 12
FREQ  20457600 AFTER 042900,225,67 STATION 4
TRANSMITTER ON AT 065000,225,67 STATION 4
FREQ  20457600 AFTER 142500,225,67 STATION 1
TRANSMITTER ON AT 150500,225,67 STATION 1
FREQ  20457600 AFTER 224500,225,67 STATION 12
TRANSMITTER ON AT 224500,225,67 STATION 12
FREQ  20451600 AFTER 014500,226,67 STATION 12
FREQ  20451600 AFTER 051000,226,67 STATION 4
TRANSMITTER ON AT 051000,226,67 STATION 4
FREQ  20451600 AFTER 184000,226,67 STATION 1
TRANSMITTER ON AT 155500,226,67 STATION 1
FREQ  20451600 AFTER 225300,226,67 STATION 12
TRANSMITTER ON AT 002000,227,67 STATION 12
FREQ  20455500 AFTER 043000,227,67 STATION 4
TRANSMITTER ON AT 045800,227,67 STATION 4
FREQ  20451600 AFTER 060000,227,67 STATION 4
FREQ  20451600 AFTER 165000,227,67 STATION 1
TRANSMITTER ON AT 170000,227,67 STATION 1
FREQ  20451600 AFTER 235000,227,67 STATION 12
TRANSMITTER ON AT 004000,228,67 STATION 12
FREQ  20451600 AFTER 080000,228,67 STATION 4
TRANSMITTER ON AT 080000,228,67 STATION 4
FREQ  20451600 AFTER 175000,228,67 STATION 1
TRANSMITTER ON AT 180300,228,67 STATION 1
FREQ  20451600 AFTER 004000,229,67 STATION 12
TRANSMITTER ON AT 011500,229,67 STATION 12
```

```
FREQ  20451600 AFTER 083100,229,67 STATION 4
TRANSMITTER ON AT 094000,229,67 STATION 4
FREQ  20451600 AFTER 183400,229,67 STATION 1
TRANSMITTER ON AT 184300,229,67 STATION 1
FREQ  20451600 AFTER 013700,230,67 STATION 12
TRANSMITTER ON AT 020300,230,67 STATION 12
FREQ  20451600 AFTER 083600,230,67 STATION 4
TRANSMITTER ON AT 091300,230,67 STATION 4
FREQ  20451600 AFTER 191100,230,67 STATION 1
TRANSMITTER ON AT 192300,230,67 STATION 1
FREQ  20451600 AFTER 021200,231,67 STATION 12
TRANSMITTER ON AT 030300,231,67 STATION 12
CHANGE EXECUTE
PRINT ALL CONTROLS
        END DATA
```

```
*THIS IS THE ODGX DECK FOR THE 3RD ELLIPSE PHASE
*OF L/O MISSION 5  -  BIMAT CUT TO END OF PHOTO READOUT
*THE MASTER FILE SUMMARY IS FROM 200132,230 TO 022402,240
*THE L/O LIBRARY SAVE B1 TAPES ARE 11221, 11387, AND 11902
*THE L/O LIBRARY SAVE B2 TAPE = 11822
*ALL ANGLES ARE IGNORED AND THE RESOLVER CORRECTION IS IN
CHANGE NEW ODP FILE
REMOVE ALL CONTROLS
CHANGE EXECUTE
IGNORE ANGLES STATIONS 1,4,12
IGNORE CC3 FROM 124002,235,67 TO 124500,235,67 STATION 4
IGNORE C3 AT 124402,235,67 STATION 12
IGNORE CC3 FROM 124502,235,67 TO 124602,235,67 STATION 1
IGNORE C3 AT 124802,235,67 STATION 4
IGNORE CC3 FROM 162202,235,67 TO 162802,235,67 STATION 4
IGNORE CC3 AT 193302,235,67 STATION 4
IGNORE CC3 AT 204202,235,67 STATION 4
IGNORE CC3 AT 212202,235,67 STATION 4
IGNORE CC3 AT 214202,235,67 STATION 4
IGNORE C3 FROM 215702,235,67 TO 221702,235,67 STATION 1
IGNORE CC3 AT 221702,235,67 STATION 4
IGNORE CC3 FROM 224500,235,67 TO 224702,235,67 STATION 1
IGNORE C3 AT 224802,235,67 STATION 12
IGNORE C3 FROM 145601,237,67 TO 145703,237,67 STATION 4
IGNORE CC3 FROM 161301,237,67 TO 161503,237,67 STATION 4
IGNORE CC3 FROM 173101,237,67 TO 173203,237,67 STATION 4
IGNORE CC3 FROM 205201,237,67 TO 205303,237,67 STATION 4
IGNORE CC3 FROM 215801,237,67 TO 215903,237,67 STATION 4
IGNORE CC3 FROM 014600,238,67 TO 015600,238,67 STATION 1
IGNORE CC3 FROM 045600,238,67 TO 051000,238,67 STATION 1
IGNORE CC3 FROM 072400,238,67 TO 072902,238,67 STATION 1
IGNORE C3 FROM 072600,238,67 TO 073000,238,67 STATION 12
IGNORE CC3 FROM 080600,238,67 TO 082000,238,67 STATION 12
IGNORE C3 FROM 160401,238,67 TO 160503,238,67 STATION 4
IGNORE CC3 AT 100202,239,67 STATION 12
IGNORE CC3 AT 125002,239,67 STATION 12
IGNORE C3 FROM 182300,239,67 TO 183000,239,67 STATION 4
CHANGE EXECUTE
COUNT TIME 60 STATIONS 1,4,12
ADJUST C3 BY -.23 FROM 020000,231,67 TO 050000,231,67 STATION 12  $ 62 XNT
ADJUST C3 BY +.23 FROM 020000,231,67 TO 050000,231,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 095000,231,67 TO 121000,231,67 STATION 4  $ 12XNT
ADJUST C3 BY +.08 FROM 095000,231,67 TO 121000,231,67 STATION 12 $ 4 XNT
ADJUST C3 BY +.31 FROM 194000,231,67 TO 210000,231,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 194000,231,67 TO 210000,231,67 STATION 4  $ 62 XNT
ADJUST C3 BY -.23 FROM 024000,232,67 TO 052000,232,67 STATION 12 $ 62 XNT
ADJUST C3 BY +.23 FROM 024000,232,67 TO 052000,232,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 115500,232,67 TO 132000,232,67 STATION 4  $ 12 XNT
ADJUST C3 BY +.08 FROM 115500,232,67 TO 132000,232,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 200000,232,67 TO 210000,232,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 200000,232,67 TO 210000,232,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 034000,233,67 TO 062000,233,67 STATION 12 $ 1  XNT
ADJUST C3 BY +.23 FROM 034000,233,67 TO 062000,233,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 115500,233,67 TO 141000,233,67 STATION 4  $ 12 XNT
ADJUST C3 BY +.08 FROM 115500,233,67 TO 141000,233,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 211500,233,67 TO 221500,233,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 211500,233,67 TO 221500,233,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 040000,234,67 TO 073000,234,67 STATION 12 $ 1  XNT
ADJUST C3 BY +.23 FROM 040000,234,67 TO 073000,234,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 122000,234,67 TO 150000,234,67 STATION 4  $ 12 XNT
```

```
ADJUST C3 BY +.08 FROM 122000,234,67 TO 150000,234,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 210000,234,67 TO 220000,234,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 210000,234,67 TO 220000,234,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 043000,235,67 TO 080000,235,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 043000,235,67 TO 080000,235,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 112000,235,67 TO 160000,235,67 STATION 4  $ 12 XNT
ADJUST C3 BY +.08 FROM 112000,235,67 TO 160000,235,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 211500,235,67 TO 230000,235,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 211500,235,67 TO 230000,235,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 050000,236,67 TO 070000,236,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 050000,236,67 TO 070000,236,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 143000,236,67 TO 165900,236,67 STATION 4  $ 12 XNT
ADJUST C3 BY +.08 FROM 143000,236,67 TO 170000,236,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 220000,236,67 TO 010000,237,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 220000,236,67 TO 010000,237,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 050000,237,67 TO 080000,237,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 050000,237,67 TO 080000,237,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 135000,237,67 TO 160000,237,67 STATION 4  $ 12 XNT
ADJUST C3 BY +.08 FROM 135000,237,67 TO 160000,237,67 STATION 12 $ 4  XNT
ADJUST C3 BY -.23 FROM 060000,238,67 TO 073000,238,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 060000,238,67 TO 073000,238,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 150000,238,67 TO 183000,238,67 STATION 4  $12 XNT
ADJUST C3 BY +.08 FROM 150000,238,67 TO 183000,238,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 210000,238,67 TO 230000,238,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 210000,238,67 TO 230000,238,67 STATION 4  $ 1  XNT
ADJUST C3 BY -.23 FROM 063000,239,67 TO 090000,239,67 STATION 12  $ 62 XMT
ADJUST C3 BY +.23 FROM 063000,239,67 TO 090000,239,67 STATION 1  $ 12 XNT
ADJUST C3 BY -.08 FROM 173000,239,67 TO 183500,239,67 STATION 4  $12 XNT
ADJUST C3 BY +.08 FROM 173000,239,67 TO 183500,239,67 STATION 12 $ 4  XNT
ADJUST C3 BY +.31 FROM 230000,239,67 TO 013000,240,67 STATION 1  $ 4  XNT
ADJUST C3 BY -.31 FROM 230000,239,67 TO 013000,240,67 STATION 4  $ 1  XNT
PASSID 17/230  AFTER 191100,230,67 STATION 1
PASSID 17/231 AFTER 021200,231,67 STATION 12
PASSID 18/231 AFTER 095900,231,67 STATION 4
PASSID 18/231 AFTER 194500,231,67 STATION 1
PASSID 18/232 AFTER 024700,232,67 STATION 12
PASSID 19/232 AFTER 120000,232,67 STATION 4
PASSID 19/232 AFTER 200900,232,67 STATION 1
PASSID 19/233 AFTER 034500,233,67 STATION 12
PASSID 20/233 AFTER 115800,233,67 STATION 4
PASSID 20/233 AFTER 212200,233,67 STATION 1
PASSID 20/234 AFTER 041000,234,67 STATION 12
PASSID 21/234 AFTER 122800,234,67 STATION 4
PASSID 21/234 AFTER 211200,234,67 STATION 1
PASSID 21/235 AFTER 043300,235,67 STATION 12
PASSID 22/235 AFTER 112300,235,67 STATION 4
PASSID 22/235 AFTER 211900,235,67 STATION 1
PASSID 22/236 AFTER 050700,236,67 STATION 12
PASSID 23/236 AFTER 144300,236,67 STATION 4
PASSID 23/236 AFTER 224700,236,67 STATION 1
PASSID 23/237 AFTER 052800,237,67 STATION 12
PASSID 24/237 AFTER 135700,237,67 STATION 4
PASSID 24/237 AFTER 223400,237,67 STATION 1
PASSID 24/238 AFTER 060700,238,67 STATION 12
PASSID 25/238 AFTER 150400,238,67 STATION 4
PASSID 25/238 AFTER 211600,238,67 STATION 1
PASSID 25/239 AFTER 065600,239,67 STATION 12
PASSID 26/239 AFTER 173900,239,67 STATION 4
PASSID 26/239 AFTER 230300,239,67 STATION 1
FREQ  20451600 AFTER 191100,230,67 STATION 1
```

```
TRANSMITTER ON AT 192300,230,67 STATION 1
FREQ  20451600 AFTER 021200,231,67 STATION 12
TRANSMITTER ON AT 030300,231,67 STATION 12
FREQ  20451600 AFTER 095900,231,67 STATION 4
TRANSMITTER ON AT 101700,231,67 STATION 4
FREQ  20451600 AFTER 194500,231,67 STATION 1
TRANSMITTER ON AT 195200,231,67 STATION 1
FREQ  20451600 AFTER 024700,232,67 STATION 12
TRANSMITTER ON AT 045900,232,67 STATION 12
FREQ  20451600 AFTER 120000,232,67 STATION 4
TRANSMITTER ON AT 121000,232,67 STATION 4
FREQ  20451600 AFTER 200900,232,67 STATION 1
TRANSMITTER ON AT 205600,232,67 STATION 1
FREQ  20451600 AFTER 034500,233,67 STATION 12
TRANSMITTER ON AT 045200,233,67 STATION 12
FREQ  20451600 AFTER 115800,233,67 STATION 4
TRANSMITTER ON AT 125200,233,67 STATION 4
FREQ  20451600 AFTER 212200,233,67 STATION 1
TRANSMITTER ON AT 220300,233,67 STATION 1
FREQ  20451000 AFTER 041000,234,67 STATION 12
TRANSMITTER ON AT 044800,234,67 STATION 12
FREQ  20451000 AFTER 122800,234,67 STATION 4
TRANSMITTER ON AT 142400,234,67 STATION 4
FREQ  20451000 AFTER 211200,234,67 STATION 1
TRANSMITTER ON AT 211200,234,67 STATION 1
FREQ  20451000 AFTER 043300,235,67 STATION 12
TRANSMITTER ON AT 064800,235,67 STATION 12
FREQ  20451000 AFTER 112300,235,67 STATION 4
TRANSMITTER ON AT 112300,235,67 STATION 4
FREQ  20451000 AFTER 2119,235,67 STATION 1
TRANSMITTER ON AT 224500,235,67 STATION 1
FREQ  20451000 AFTER 050700,236,67 STATION 12
TRANSMITTER ON AT 050700,236,67 STATION 12
FREQ  20451000 AFTER 144300,236,67 STATION 4
TRANSMITTER ON AT 144300,236,67 STATION 4
FREQ  20451000 AFTER 224700,236,67 STATION 1
TRANSMITTER ON AT 001400,237,67 STATION 1
FREQ  20451000 AFTER 052800,237,67 STATION 12
TRANSMITTER ON AT 063800,237,67 STATION 12
FREQ  20451000 AFTER 135700,237,67 STATION 4
TRANSMITTER ON AT 161300,237,67 STATION 4
FREQ  20451000 AFTER 223400,237,67 STATION 1
TRANSMITTER ON AT 223400,237,67 STATION 1
FREQ  20451000 AFTER 060700,238,67 STATION 12
TRANSMITTER ON AT 080700,238,67 STATION 12
FREQ  20451000 AFTER 150400,238,67 STATION 4
TRANSMITTER ON AT 174200,238,67 STATION 4
FREQ  20451000 AFTER 211600,238,67 STATION 1
TRANSMITTER ON AT 000500,239,67 STATION 1
FREQ  20451000 AFTER 065600,239,67 STATION 12
TRANSMITTER ON AT 093800,239,67 STATION 12
FREQ  20451000 AFTER 173900,239,67 STATION 4
TRANSMITTER ON AT 191100,239,67 STATION 4
FREQ  20451000 AFTER 230300,239,67 STATION 1
TRANSMITTER ON AT 012500,240,67 STATION 1
CHANGE EXECUTE
PRINT ALL CONTROLS
      END DATA
```

10

TDPX LINK DECKS

This section presents listings of the TDPX and ODGX input decks used during this mission.

The first TDPX Link 1 deck listed established the epoch that was used for all Mission V master files. No data can be added to a master file prior to this epoch. The second Link 1 deck was used for reading the B1 tape onto disc, and the deck that should be used by postmission analysts. The first TDPX Link 2 deck was used to place ETR data on the cislunar master file, while the second deck was used to input nominal instructions to the program for processing data.

The ODGX deck listings contain all inputs necessary for processing the data on the related master files. The listed save B2 tapes were made using the listed decks. For postmission analysis of segregated time spans, IGNORE BEFORE and/or IGNORE AFTER control cards (with the appropriate time fields specified) should be used. In no instance should the save B2 tapes be rewritten.

TDPX LINK 1 - ESTABLISH PRE-LAUNCH EPOCH

```
FILE DISPOSITION                                                    (1
(NEW EPOCH - DESTROY MASTER                                         )
EPOCH                                                               (2
6708001 23,0000000
        END DATA                                                    (0
```

TDPX LINK 1 - INITIALIZE FROM TAPE OPTION

```
FILE DISPOSITION                                                    (1
(INITIALIZE MASTER FROM TAPE                                        )
        END DATA                                                    (0
```

TDPX LINK 2 - LAUNCH TO STATION 41 ACQUISITION

```
CHANGE CLEAR REJECTED DATA
CHANGE NOSORT
CHANGE SELECT DISC
CHANGE  DAY RESET  213
CHANGE  S BAND STATION 5
CHANGE  EXTERNAL 74  STATION 6
CHANGE  EXTERNAL 79 STATION 7
CHANGE  EXTERNAL 22 STATION 8
CHANGE  EXTERNAL 76 STATION 9
CHANGE  EXTERNAL 83 STATION 10
CHANGE  EXTERNAL 82 STATION 11
FORMAT(3(L2,1B),4L1,1B,3L2,1B,L3,1B,L1[illegible],17X,L6,1B,L6)NUMBER15
ASSIGN(ID,DC7,DC4,DC1,DC2,DC3,DC5,HR,MIN,SEC,DAY,DP,HA,DEC)NUMBER15
        END DATA                                                    (0
```

TDPX LINK 2 - STANDARD INPUT DECK FOLLOWING LINK 1

```
CHANGE SELECT DISC
CHANGE NOSORT
        END DATA                                                    (0
```

FILE SUMMARIES

Master file and ODP file summaries for each mission phase are contained in this appendix section. Also listed is a corresponding tabulation of the B-1 and B-2 saved tapes.

These tapes should not be altered in any way (i.e., they may be "read" but not "written"). If it is desired to alter the ODP file, the corresponding B-1 may be "read" and a new B-2 tape used when running ODGX.

MISSION 5 CISLUNAR MASTER FILE

L/O LIBRARY SAVE B1 TAPES = 11952, 11728

TIME POINTS SENT TO MASTER FILES-	ACCEPTED	REPLACED
	7904	620

MASTER FILE DATA SUMMARY.	STA	COUNT	HHMMSS,	DAY TO	HHMMSS,	DAY ELAPSED	HHMMSS.	DAYS	TIME IN SECONDS		ELAPSED
	1	2823	044802	214	184102	217	135300	3	22502.0	331682.0	309180.0
	4	2384	231941	213	073602	217	081621	3	2801.0	291782.0	288981.0
	5	244	230733	213	080302	214	085529	0	2073.0	34202.0	32129.0
	6	64	223924	213	224554	213	000630	0	384.0	774.0	390.0
	7	54	225242	213	225948	213	000706	0	1182.0	1608.0	426.0
	9	89	230400	213	231324	213	000924	0	1860.0	2424.0	564.0
	10	149	231748	213	233318	213	001530	0	2688.0	3618.0	930.0
	11	29	223506	213	223800	213	000254	0	126.0	300.0	174.0
	12	2068	125502	214	184202	217	054700	3	51722.0	331742.0	280020.0

MISSION 5 CISLUNAR ODP FILE SUMMARY

L/O LIBRARY SAVE B2 TAPE = 12544

DATA NOT USED BECAUSE	STATION NO. 1	2	3	4	5	6	7	8	9	10	11	12
RANGE DATA CONDITION CODE	1	0	0	0	0	0	0	0	0	0	0	1
LOGICAL TRANSMITTER ERRORS	63	0	0	77	15	0	0	0	0	0	0	81
BAD ANGLES NOT IN AUTO TRACK	38	0	0	37	3	0	0	0	0	0	0	24
DSIF DATA IN MANUAL MODE	38	0	0	37	3	0	0	0	9	2	29	24
GOOD DOPPLER IGNORED BY INPUT	129	0	0	115	144	128	108	0	160	294	0	71
GOOD ANGLES IGNORED BY INPUT	4993	0	0	3472	414	127	108	0	160	294	0	3774

PLEASE NOTE - DATA VALUES ADJUSTED BY POLY

SUMMARY OF DATA TYPES ON THE ODP DATA FILE

PLEASE NOTE - END TIMES MAY BE IN ERROR BY TC/2

STA	START TIME	END TIME	R	DR	EL	AZ	DEC	HA	C1	CC3	C3	PRU	RU
1	044932.000,214	184102.000,217	0	0	0	0	0	0	0	1542	753	0	1046
4	231041.000,213	073602.000,217	0	0	0	0	483	483	0	1605	264	0	864
5	230733.000,213	052902.000,214	0	0	0	0	34	34	0	0	70	0	0
12	130132.000,214	184202.000,217	0	0	0	0	0	0	0	1467	266	0	957

MISSION 5 FIRST/SECOND ELLIPSE MASTER FILE

L/O LIBRARY SAVE B1 TAPES = 12601, 12581, 12558

TIME POINTS SENT TO MASTER FILES -	ACCEPTED	REPLACED
	9263	669

MASTER FILE DATA SUMMARY.

STA	COUNT	HHMMSS.	DAY	TO HHMMS.	DAY	ELAPSED HHMMSS.	DAYS	TIME IN SECONDS		ELAPSED
1	3357	063002	217	115802	221	052800	4	287822.0	653102.0	365280.0
4	2865	023002	217	112002	221	085000	4	273422.0	650822.0	377400.0
12	3041	150502	217	041402	221	130900	3	318722.0	625262.0	306540.0

MISSION 5 FIRST AND SECOND ELLIPSE ODP FILE SUMMARY

L/O LIBRARY SAVE B2 TAPE = 11960

DATA NOT USED BECAUSE:	STATION NO. 1	2	3	4	5	6	7	8	9	10	11	12
RANGE DATA CONDITION CODE	2	0	0	0	0	0	0	0	0	0	0	0
LOGICAL TRANSMITTER ERRORS	1	0	0	4	0	0	0	0	0	0	0	2
BAD ANGLES NOT IN AUTO TRACK	63	0	0	43	0	0	0	0	0	0	0	46
DSIF DATA IN MANUAL MODE	63	0	0	43	0	0	0	0	0	0	0	46
GOOD DOPPLER IGNORED BY INPUT	106	0	0	47	0	0	0	0	0	0	0	118
GOOD ANGLES IGNORED BY INPUT	5893	0	0	5050	0	0	0	0	0	0	0	5458

PLEASE NOTE - DATA VALUES ADJUSTED BY POLY

SUMMARY OF DATA TYPES ON THE ODP DATA FILE

PLEASE NOTE - END TIMES MAY BE IN ERROR BY TC/2

STA	START TIME	END TIME	R	DR	EL	AZ	DEC	HA	C1	CC3	C3	PRU	RU
1	063032.000,217	115002.000,221	0	0	0	0	0	0	0	1791	711	0	174
4	023002.000,217	112002.000,221	0	0	0	0	0	0	0	1937	376	0	166
12	150532.000,217	041402.000,221	0	0	0	0	0	0	0	1805	467	0	0

MISSION 5 THIRD ELLIPSED (TO BIMAT CUT) MASTER FILE

L/O LIBRARY B1 TAPES = 11478, 11734, 112624

TIME POINTS SENT TO MASTER FILES-	ACCEPTED	REPLACED
	21677	3208

MASTER FILE DATA SUMMARY.	STA	COUNT	HHMMSS,	DAY TO	HHMMSS,	DAY ELAPSED	HHMMSS,	DAYS	TIMES IN SECONDS		ELAPSED
	1	6008	094802	221	040002	231	181200	9	645302.0	1488422.0	843120.0
	4	8793	011502	221	192102	230	180600	9	614522.0	1457282.0	842760.0
	12	6876	002502	221	060202	231	053700	10	611522.0	1495742.0	884220.0

MISSION 5 THIRD ELLIPSE ODP FILE SUMMARY

L/O LIBRARY SAVE B2 TAPE = 11475

DATA NOT USED BECAUSE:	STATION NO 1	2	3	4	5	6	7	8	9	10	11	12
Logical Transmitter Errors	2	0	0	0	0	0	0	0	0	0	0	5
Bad Angles Not In Auto Track	87	0	0	37	0	0	0	0	0	0	0	53
DSIF Data In Manual Mode	87	0	0	37	0	0	0	0	0	0	0	53
Good Doppler Ignored By Input	279	0	0	366	0	0	0	0	0	0	0	405
Good Angles Ignored By Input	6333	0	0	8187	0	0	0	0	0	0	0	6899

Please Note - Data Values Adjusted By Poly

Summary Of Data Types On The ODP Data File

Please Note - End Times May Be In Error By TC/2

STA	START TIME	END TIME	R	DR	EL	AZ	DEC	HA	C1	CC3	C3	PRU	RU
1	091832.000,221	214602.000,225	0	0	0	0	0	0	0	1543	377	0	0
4	011532.000,221	055902.000,226	0	0	0	0	67	67	0	2006	330	0	0
12	002532.000,221	055902.000,226	0	0	0	0	396	396	0	1672	498	0	0

MISSION 5 THIRD ELLIPSE ODP FILE SUMMARY

L/O LIBRARY SAVE B2 TAPE = 12583

DATA NOT USED BECAUSE:	STATION NO 1	2	3	4	5	6	7	8	9	10	11	12
RANGE DATA CONDITION CODE	2	0	0	1	0	0	0	0	0	0	0	220
LOGICAL TRANSMITTER ERRORS	0	0	0	3	0	0	0	0	0	0	0	38
BAD ANGLES NOT IN AUTO TRACK	118	0	0	105	0	0	0	0	0	0	0	95
DSIF DATA IN MANUAL MODE	118	0	0	105	0	0	0	0	0	0	0	95
GOOD DOPPLER IGNORED BY INPUT	3003	0	0	4374	0	0	0	0	0	0	0	3634
GOOD ANGLES IGNORED BY INPUT	11779	0	0	17140	0	0	0	0	0	0	0	13559

PLEASE NOTE - DATA VALUES ADJUSTED BY POLY

SUMMARY OF DATA TYPES ON THE ODP DATA FILE

PLEASE NOTE - END TIMES MAY BE IN ERROR BY TC/2

STA	START TIME	END TIME	R	DR	EL	AZ	DEC	HA	C1	CC3	C3	PRU	RU
1	163032.000,225	035902.000,231	0	0	0	0	0	0	0	1697	76	0	0
4	051232.000,226	191902.000,230	0	0	0	0	0	0	0	2360	115	0	0
12	225032.000,225	060202.000,231	0	0	0	0	0	0	0	1542	300	0	0

MISSION 5 THIRD ELLIPSE (BIMAT CUT TO END OF READOUT) MASTER FILE.

I/O LIBRARY SAVE B1 TAPES = 11221, 11387, 11902

TIME POINTS SENT TO MASTER FILES-	ACCEPTED	REPLACED
	15888	6636

MASTER FILE DATA SUMMARY.	STA	COUNT	HHMMSS,	DAY TO	HHMMSS,	DAY ELAPSED	HHMMSS.	DAYS	TIME IN SECONDS		ELAPSED
	1	4483	200132	230	022402	240	062230	9	1459712.0	2260262.0	800550.0
	4	6052	100242	231	005202	240	144920	8	1510182.0	2254742.0	744560.0
	12	5353	021252	231	183002	239	161710	8	1481992.0	2231622.0	749830.0

MISSION 5 THIRD ELLIPSE (BIMAT CUT TO END OF READOUT)

ODP FILE SUMMARY. L/O LIBRARY B2 = 11822

DATA NOT USED BECAUSE:	STATION NO. 1	2	3	4	5	6	7	8	9	10	11	12
RANGE DATA CONDITION CODE	1	0	0	0	0	0	0	0	0	0	0	0
LOGICAL TRANSMITTER ERRORS	1	0	0	0	0	0	0	0	0	0	0	16
BAD ANGLES NOT IN AUTO TRACK	56	0	0	60	0	0	0	0	0	0	0	64
DSIF DATA IN MANUAL MODE	56	0	0	60	0	0	0	0	0	0	0	64
GOOD DOPPLER IGNORED BY INPUT	39	0	0	37	0	0	0	0	0	0	0	20
GOOD ANGLES IGNORED BY INPUT	8854	0	0	11979	0	0	0	0	0	0	0	10577

PLEASE NOTE - DATA VALUES ADJUSTED BY POLY

SUMMARY OF DATA TYPES ON THE ODP DATA FILE

PLEASE NOTE - END TIMES MAY BE IN ERROR BY TC/2

STA	START TIME	END TIME	R	DR	EL	AZ	DEC	HA	C1	CC3	C3	PRU	RU
1	200147.000,230	022402.000,240	0	0	0	0	0	0	0	2347	510	0	0
4	100312.000,231	005202.000,240	0	0	0	0	0	0	0	3777	512	0	0
12	021322.000,231	183002.000,239	0	0	0	0	0	0	0	2676	903	0	0

B1 AND B2 SAVE TAPE LISTINGS

This section presents the B1 and B2 saved tapes for Mission V. These tapes should not be altered in any way (i.e., they may be "read" but not "written"). If it is desired to alter the ODP file, the corresponding B1 may be "read" and a *new* B2 used when running ODGX.

L/O Library Tapes	TBC Tapes	Langley Tapes	Time Span (GMT) From	To
		LT500	213/2235	214/1916
		LT501	213/2235	216/0324
		LT502	213/2235	217/0843
B1=11952			213/2235	217/1842
B1=11728			213/2235	217/1842
B2=12544			213/2307	217/1842
		LT503	217/0230	218/0704
		LT504	217/0230	219/0604
		LT505	217/0230	220/0850
		LT506	217/0230	221/0651
B1=12601			217/0230	221/1158
B1=12581			217/0230	221/1158
B1=12558			217/0230	221/1158
B2=11960			217/0230	221/1158
		LT507	221/0025	(?)
		LT508	221/0025	224/2320
		LT509	221/0025	226/0647
		LT510	221/0025	227/1004
		LT511	221/0025	228/1327
		LT512	221/0025	229/0950
		LT513	221/0025	231/0224
			221/0025	231/0602

L_2O Library Tapes	TBC Tapes	Langley Tapes	Time Span (GMT) From	To
B1=11478			221/0025	231/0602
B1=11734			221/0025	231/0602
B1=12624			221/0025	231/0602
B2=11475			221/0025	226/0559
B2=12583			225/1630	231/0602
		LT514	230/2001	235/0047
		LT515	230/2001	236/0239
B1=11221			230/2001	240/0224
B1=11387			230/2001	240/0224
B1=11902			230/2001	240/0224
B2=11822			230/2001	240/0224

TRACKING DATA BAR CHARTS

The tracking data bar charts presented here show, in graphic form, when and in what form tracking data was received throughout Mission V. Frequencies, transmitter-on-times (hand-overs), perilune times, and pass numbers are shown as well as OD data arcs, engine ignition times, and supplementary notes.

LUNAR ORBITER TRACKING PATTERN

MISSION PHASE Translunar

DAY NO. 213

DATE 8/1

GOOD DATA

POOR DATA

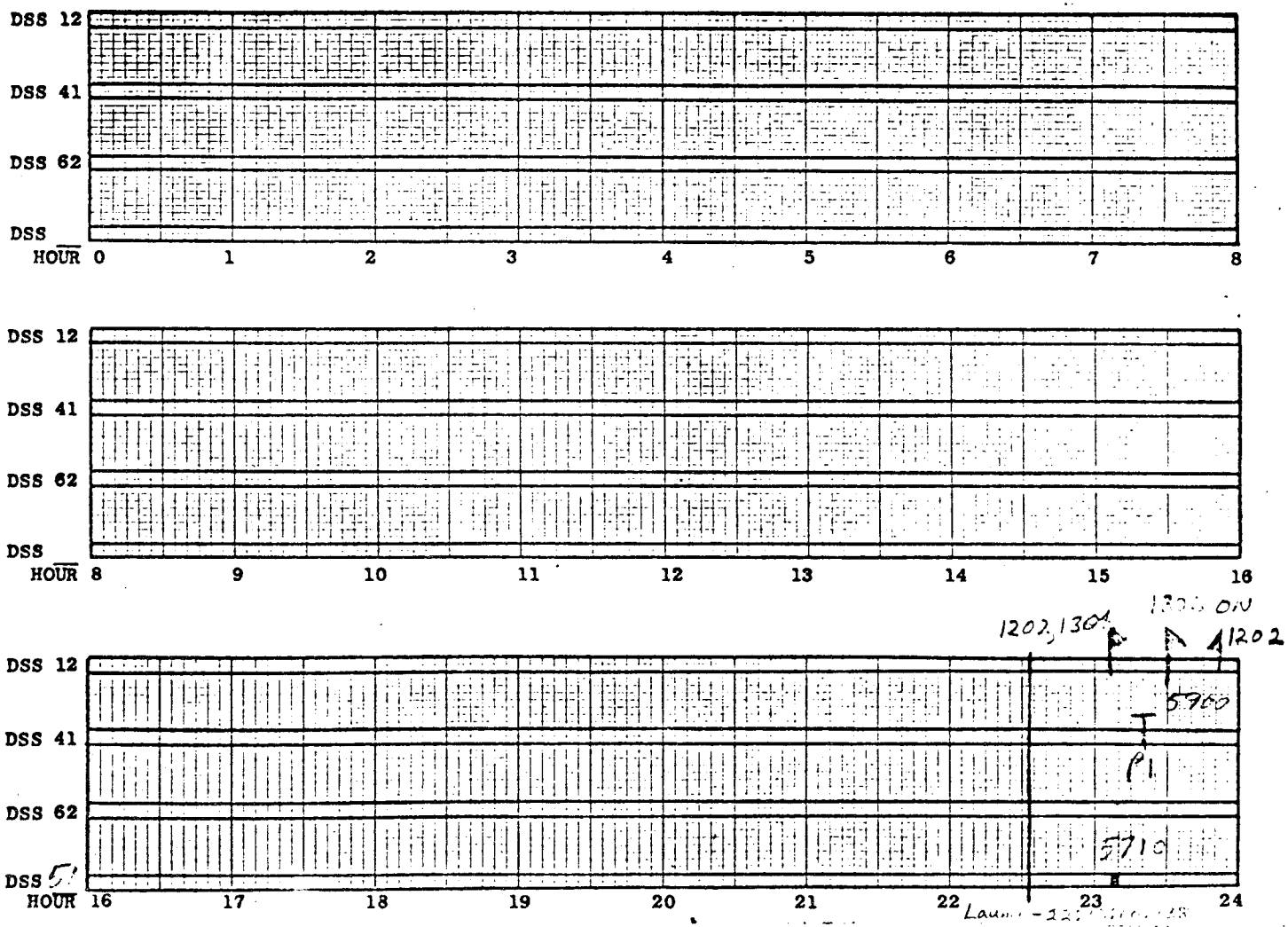
OCCULTATION

RANGING R

O.D. ARC

HANDOVER

PERILUNE P

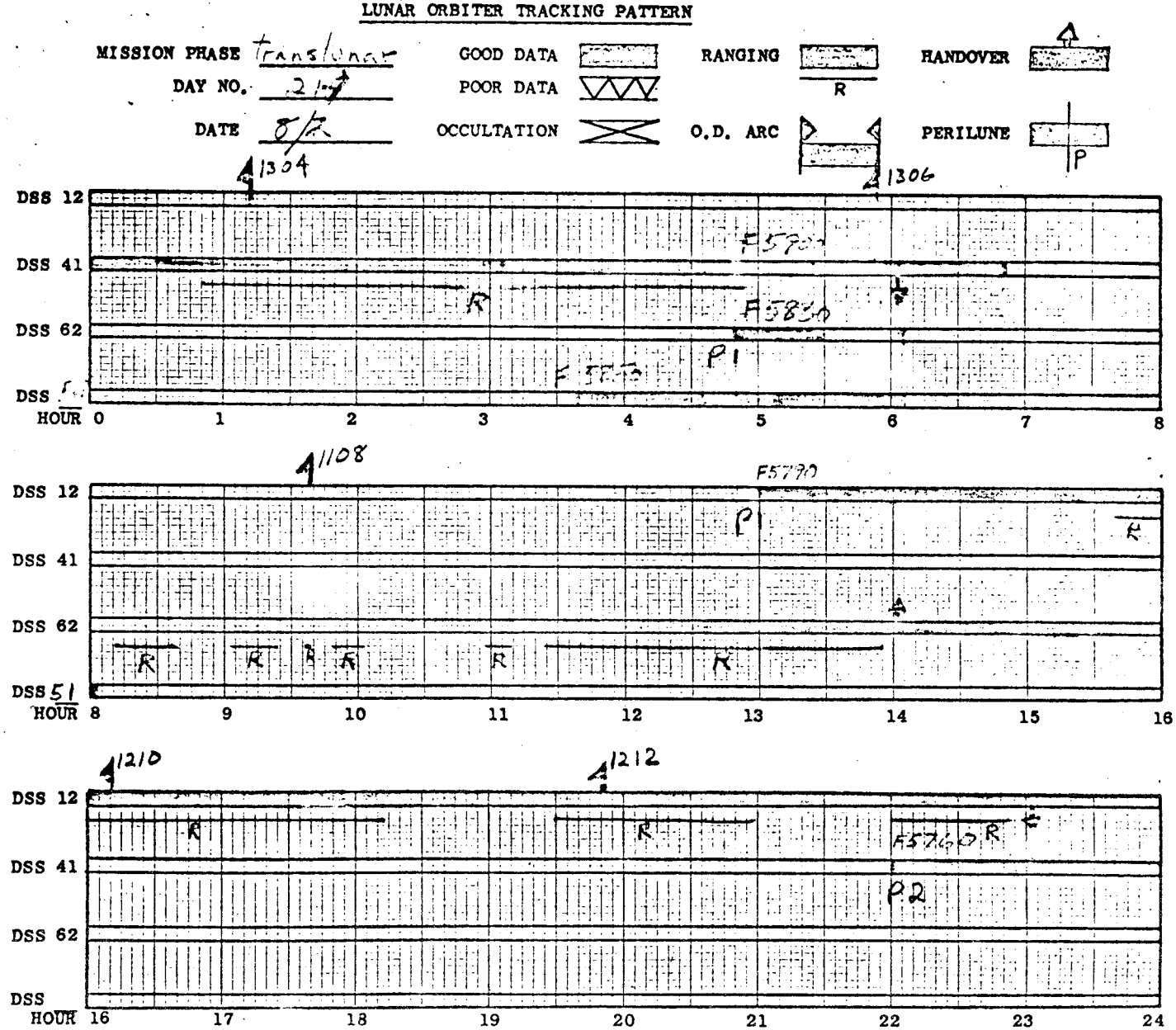


LUNAR ORBITER TRACKING PATTERN

MISSION PHASE translunar

DAY NO. 21

DATE 8/2



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE T/L

DAY NO. 215

DATE 8/3

GOOD DATA

POOR DATA

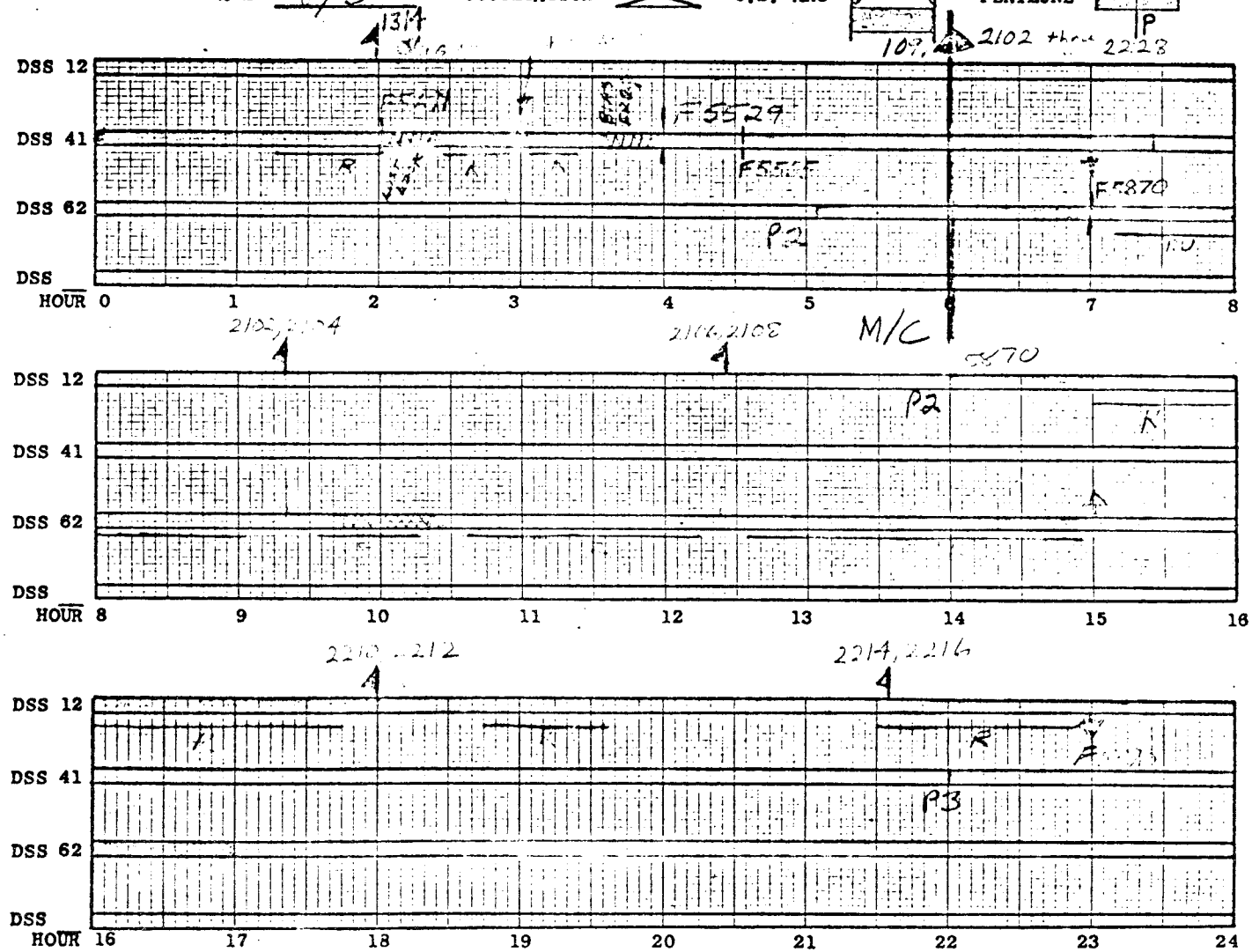
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE

DAY NO.

DATE

GOOD DATA

POOR DATA

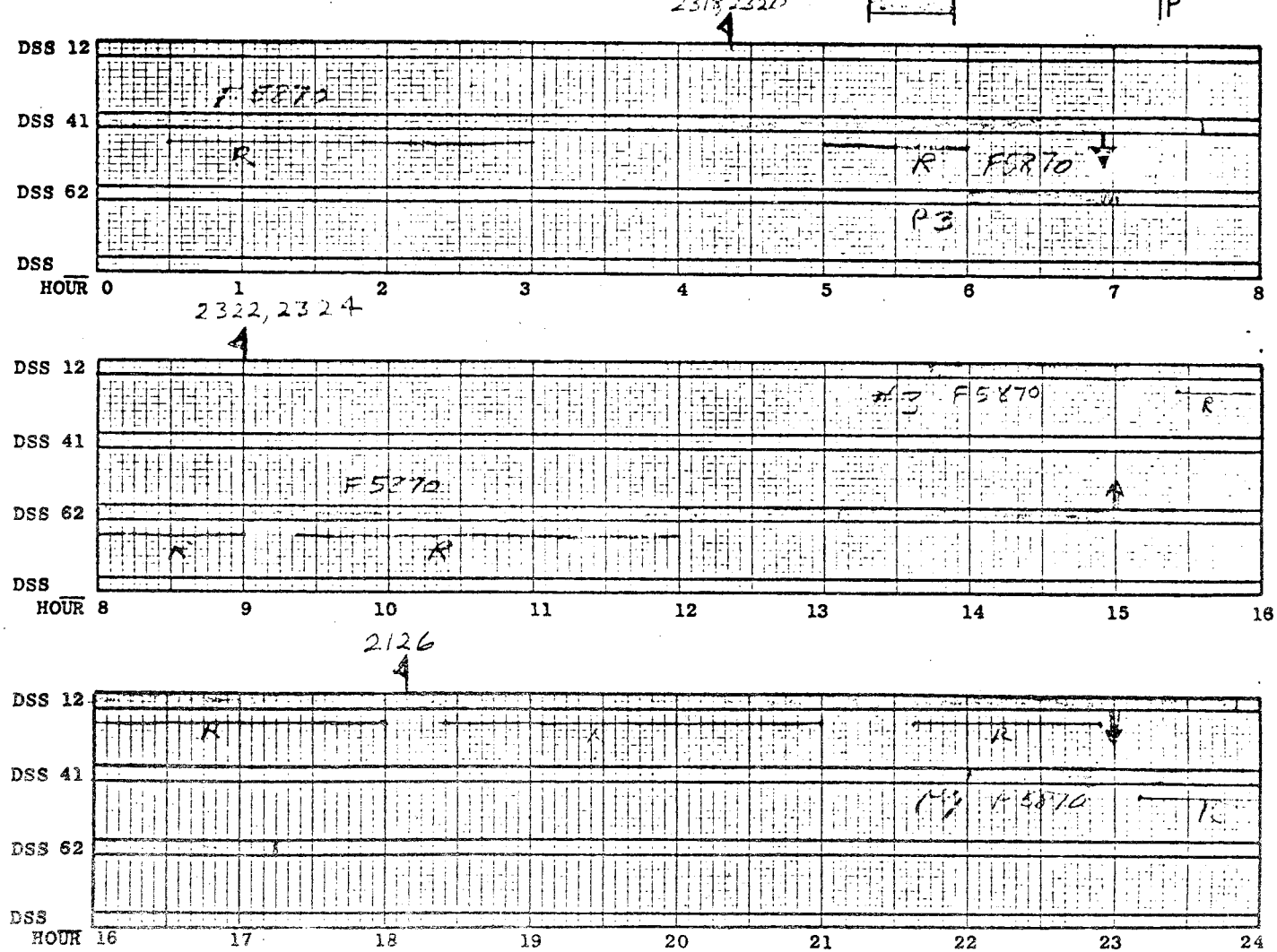
OCCULTATION

RANGING (R)

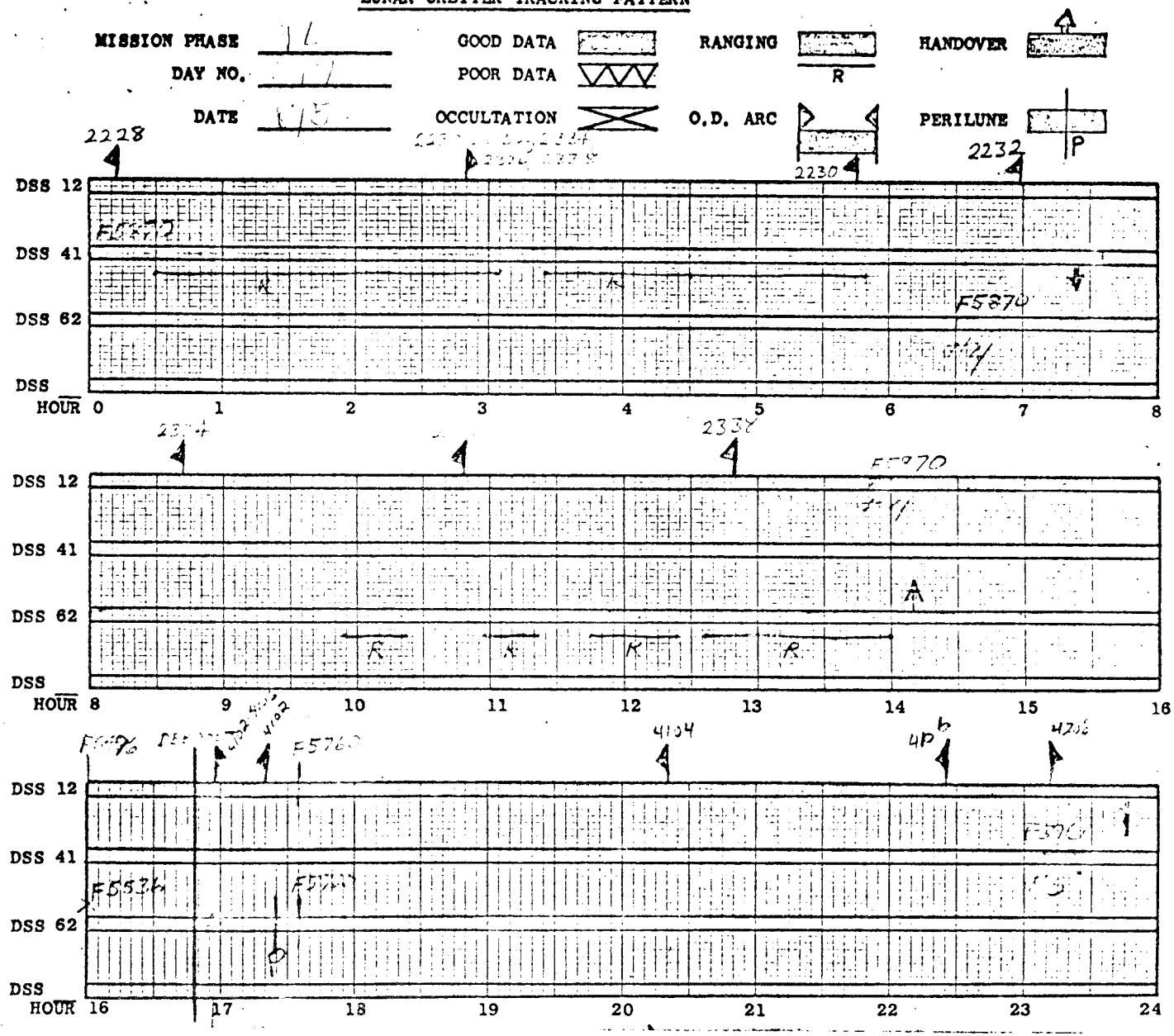
O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE _____

DAY NO. 2,8

DATE 8/6

GOOD DATA

POOR DATA

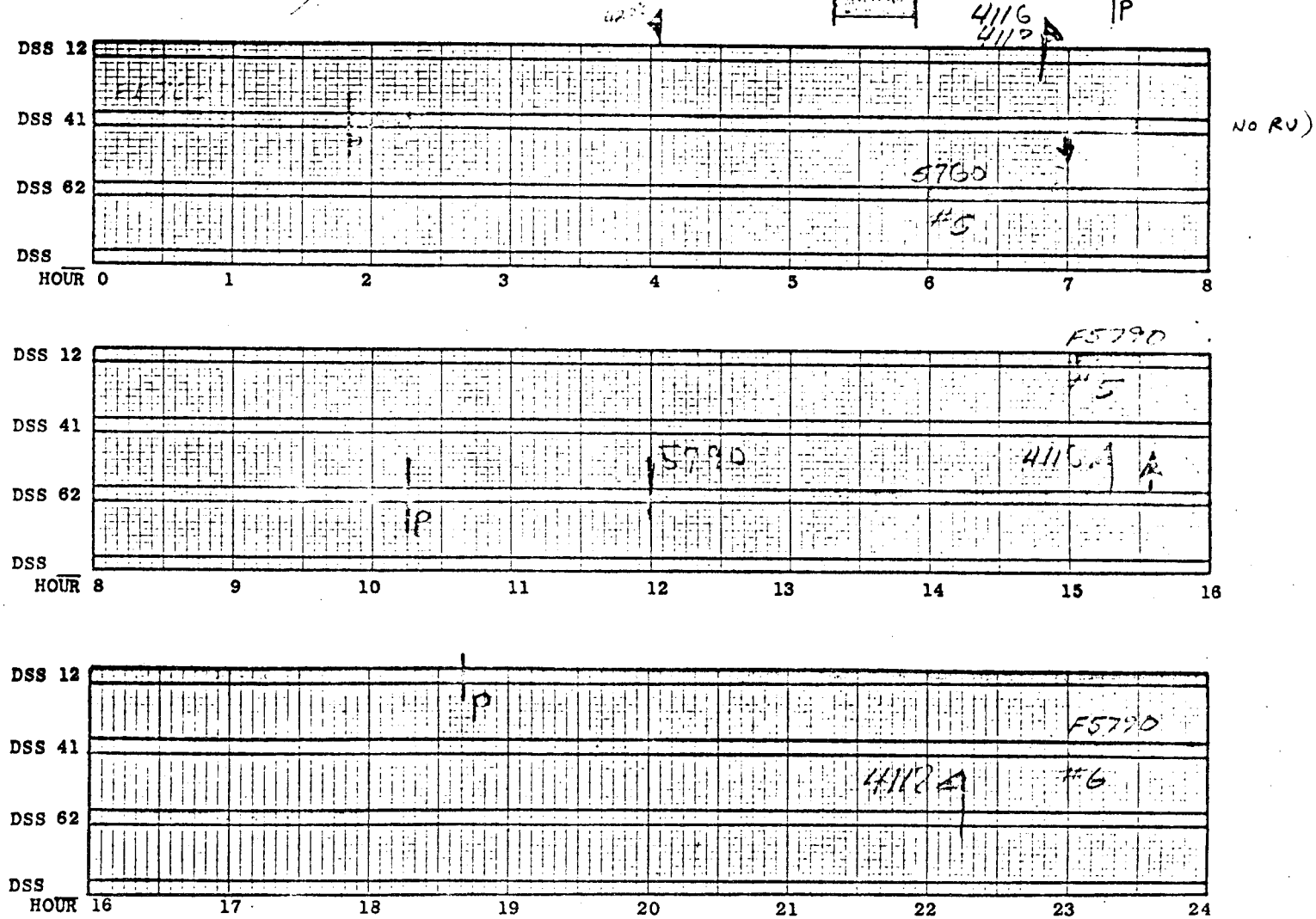
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE _____

DAY NO. _____

DATE _____

GOOD DATA

POOR DATA

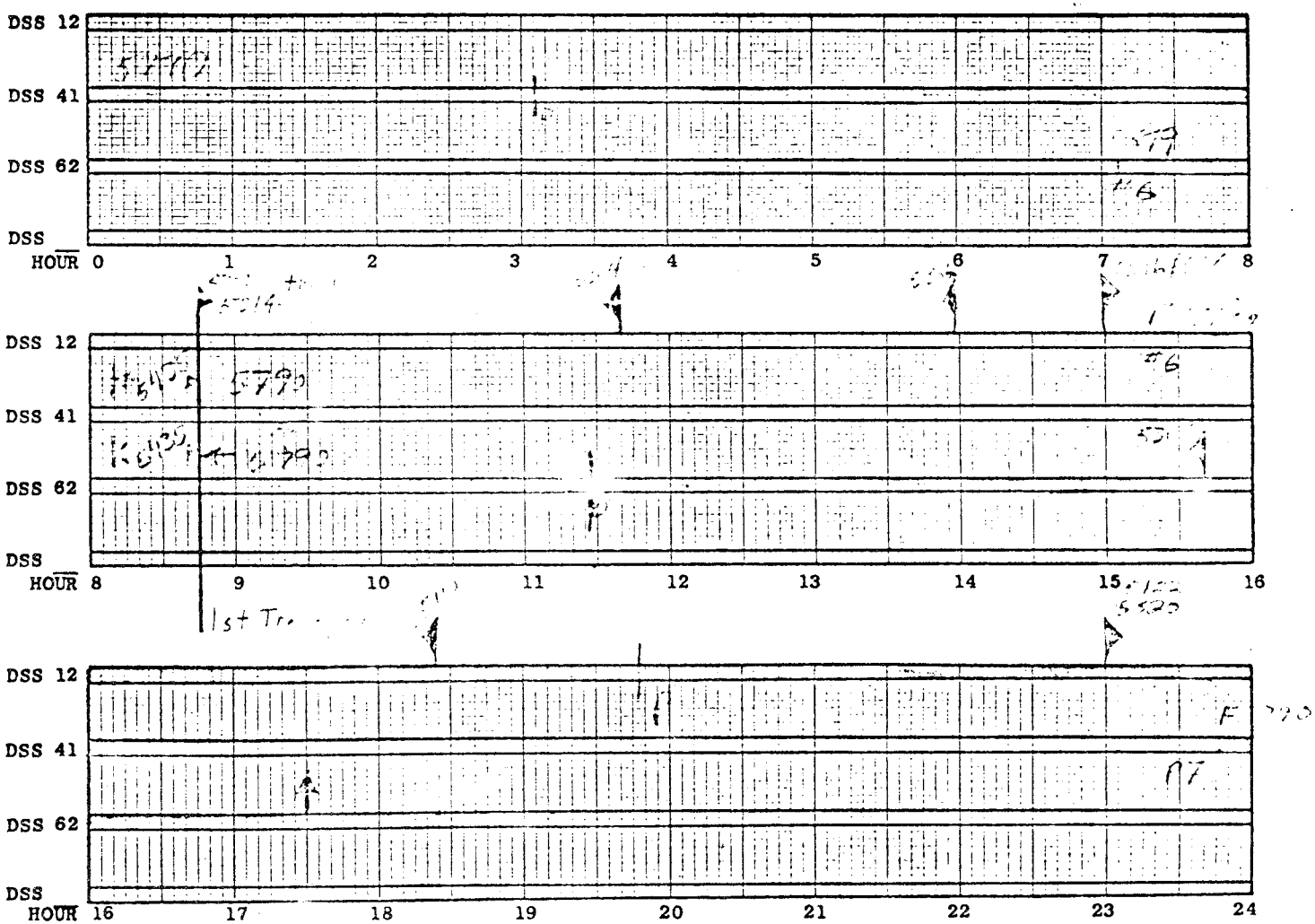
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 2nd

DAY NO. 23

DATE 8/C

GOOD DATA

POOR DATA

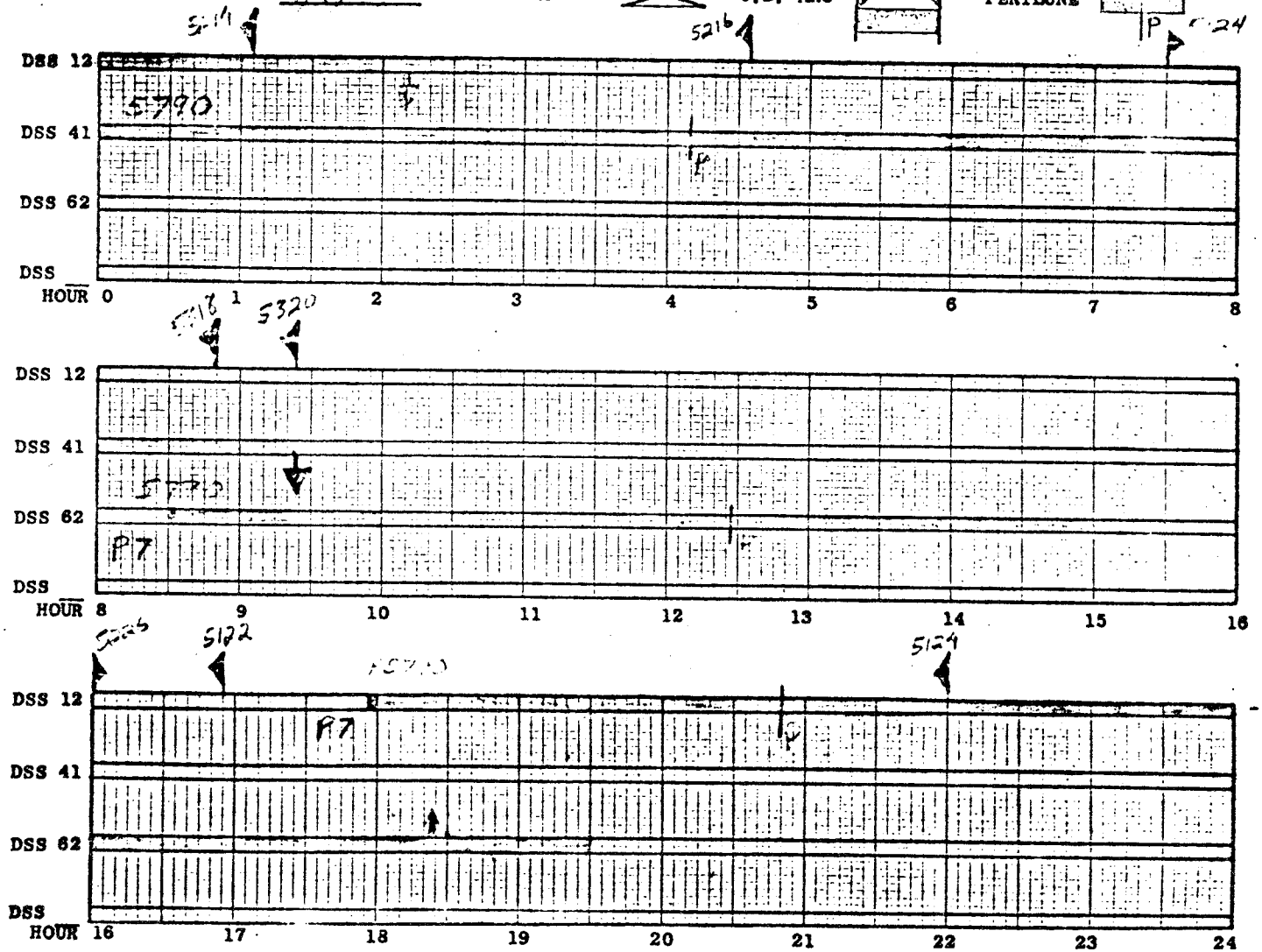
OCCULTATION

RANGING (R)

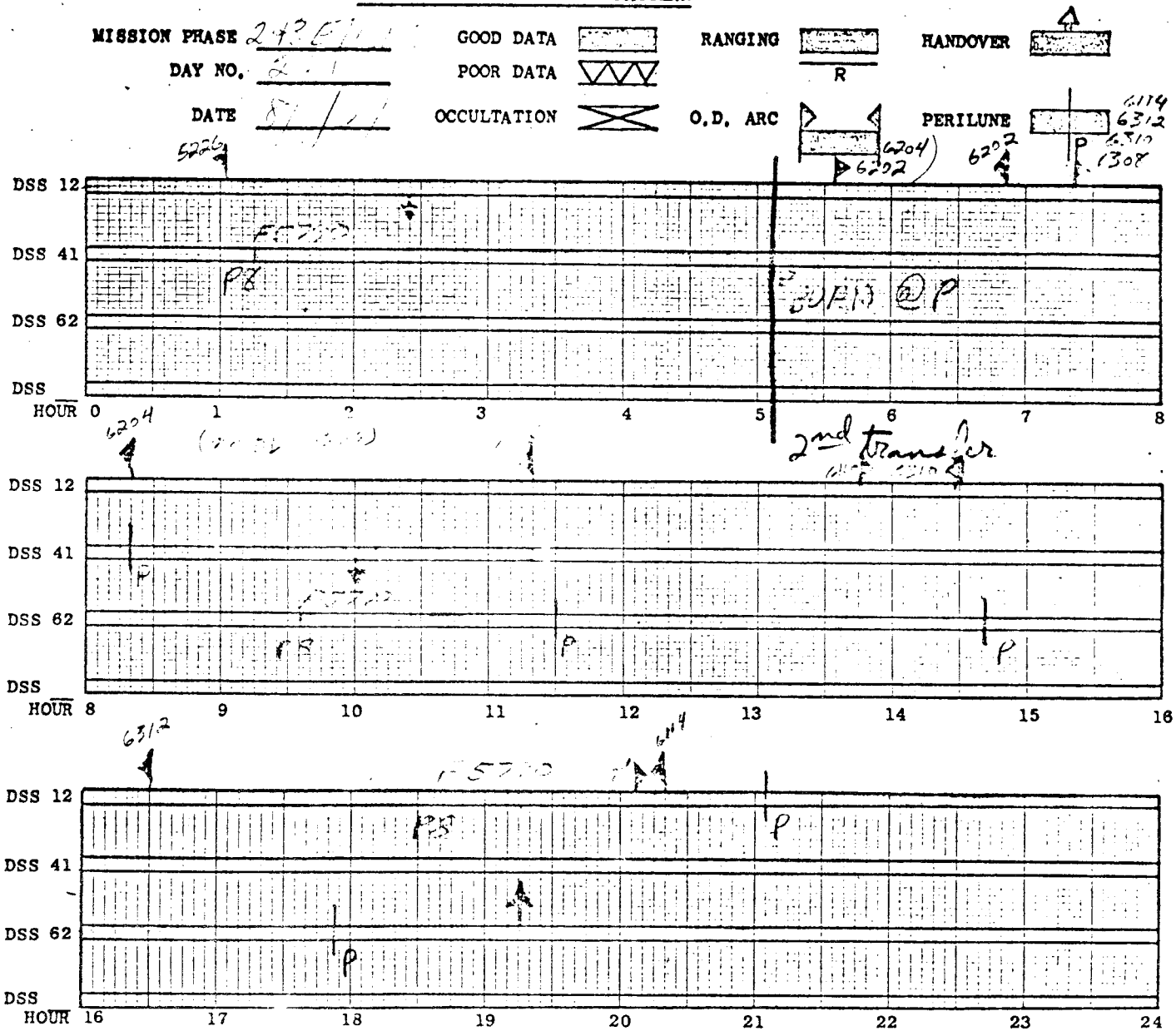
O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE

DAY NO. 222

DATE 8/10/67

GOOD DATA

POOR DATA

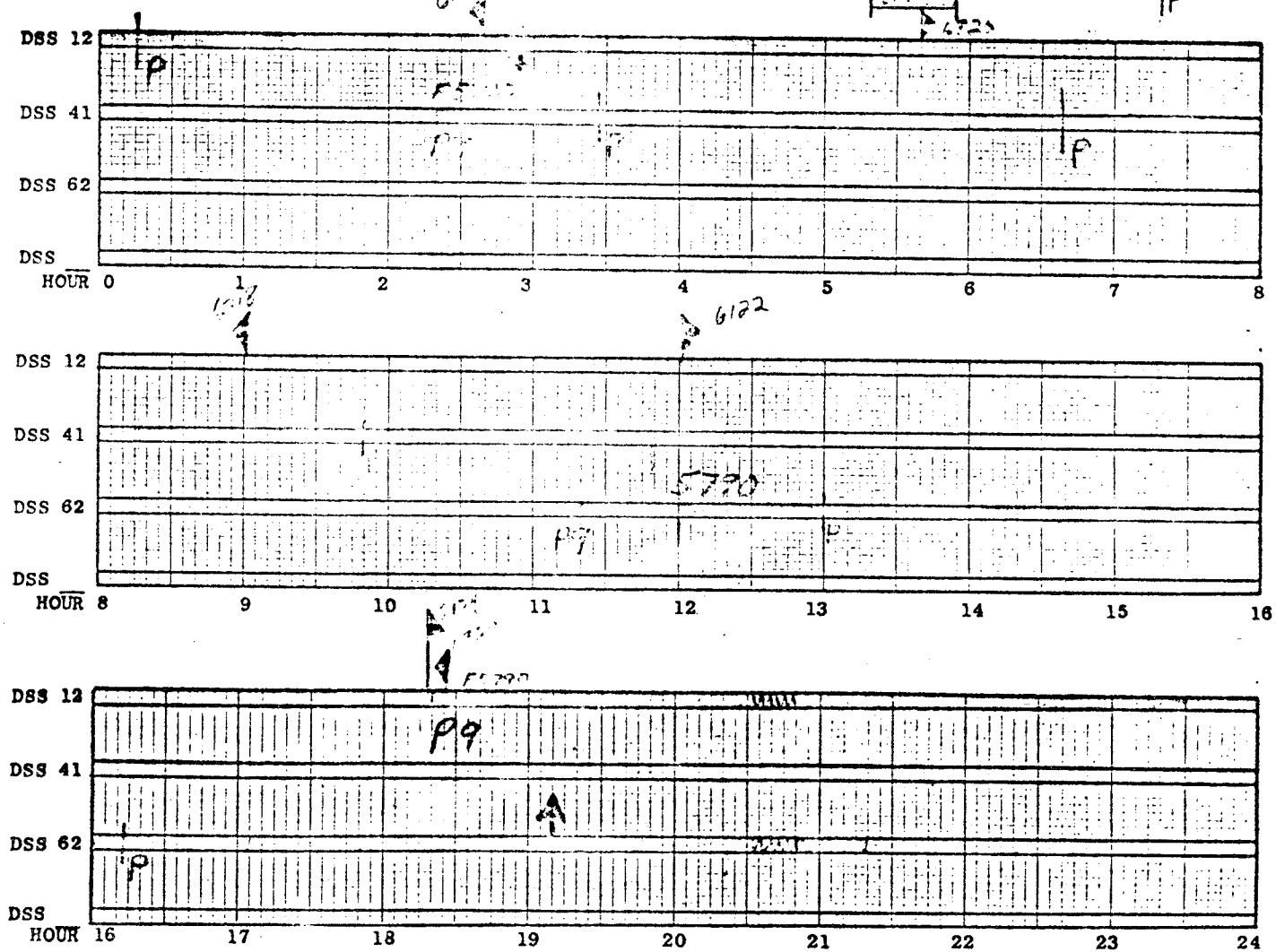
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE

DAY NO.

DATE

GOOD DATA

POOR DATA

OCCULTATION

RANGING

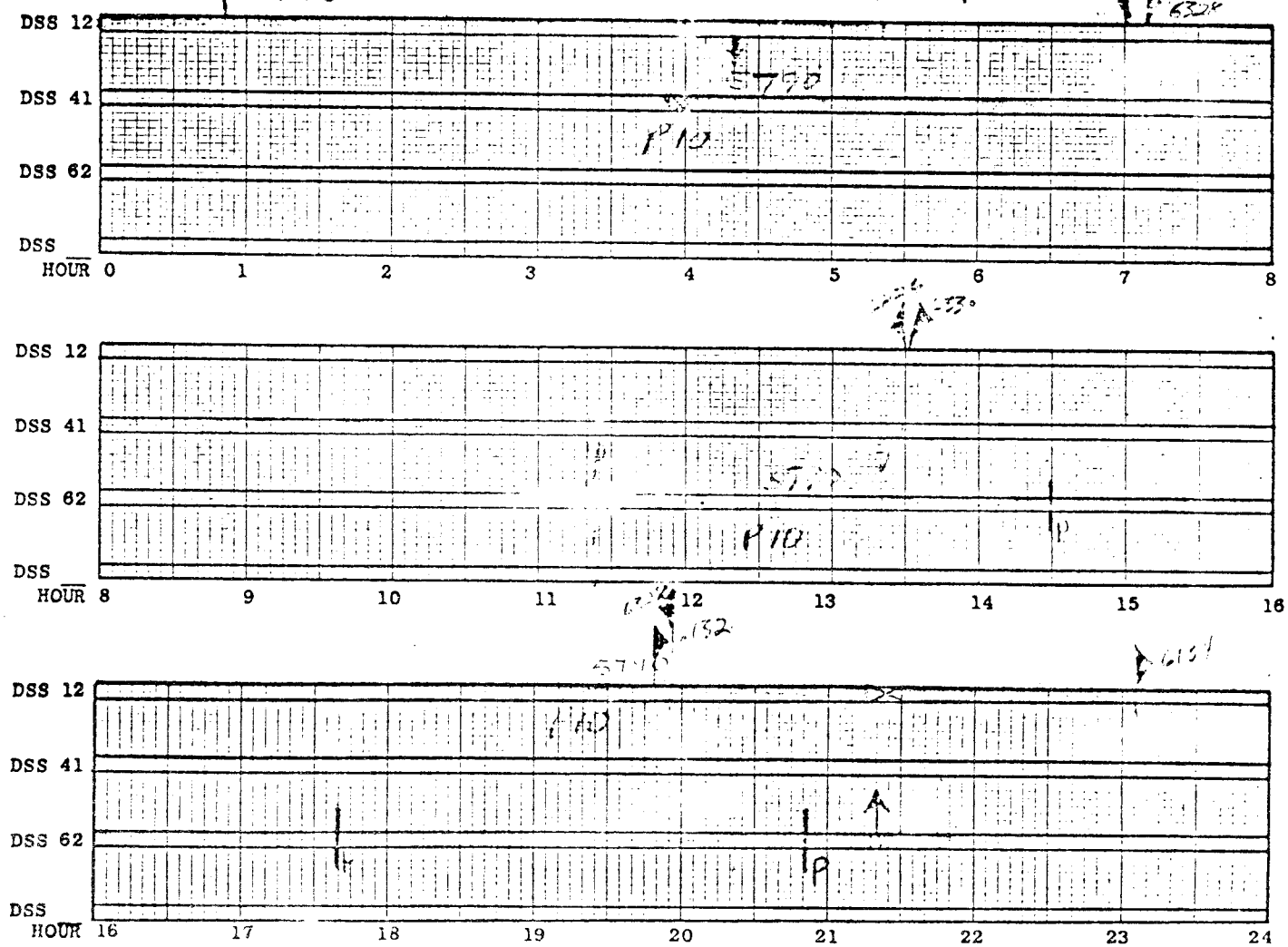
R

O.D. ARC

HANDOVER

PERILUNE

P



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Mission

DAY NO. 224

DATE 8/12/67

GOOD DATA

POOR DATA

OCCULTATION

RANGING

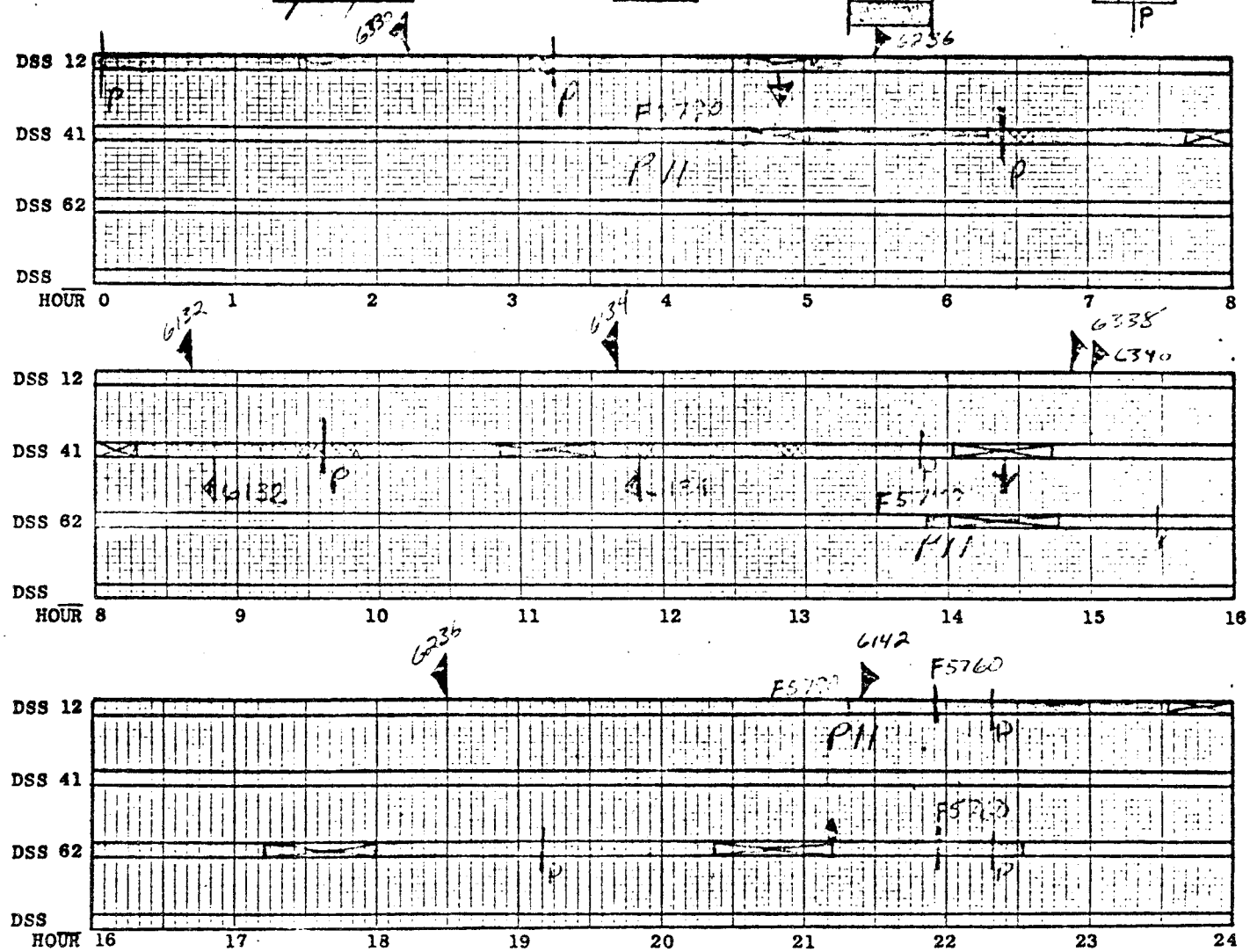
R

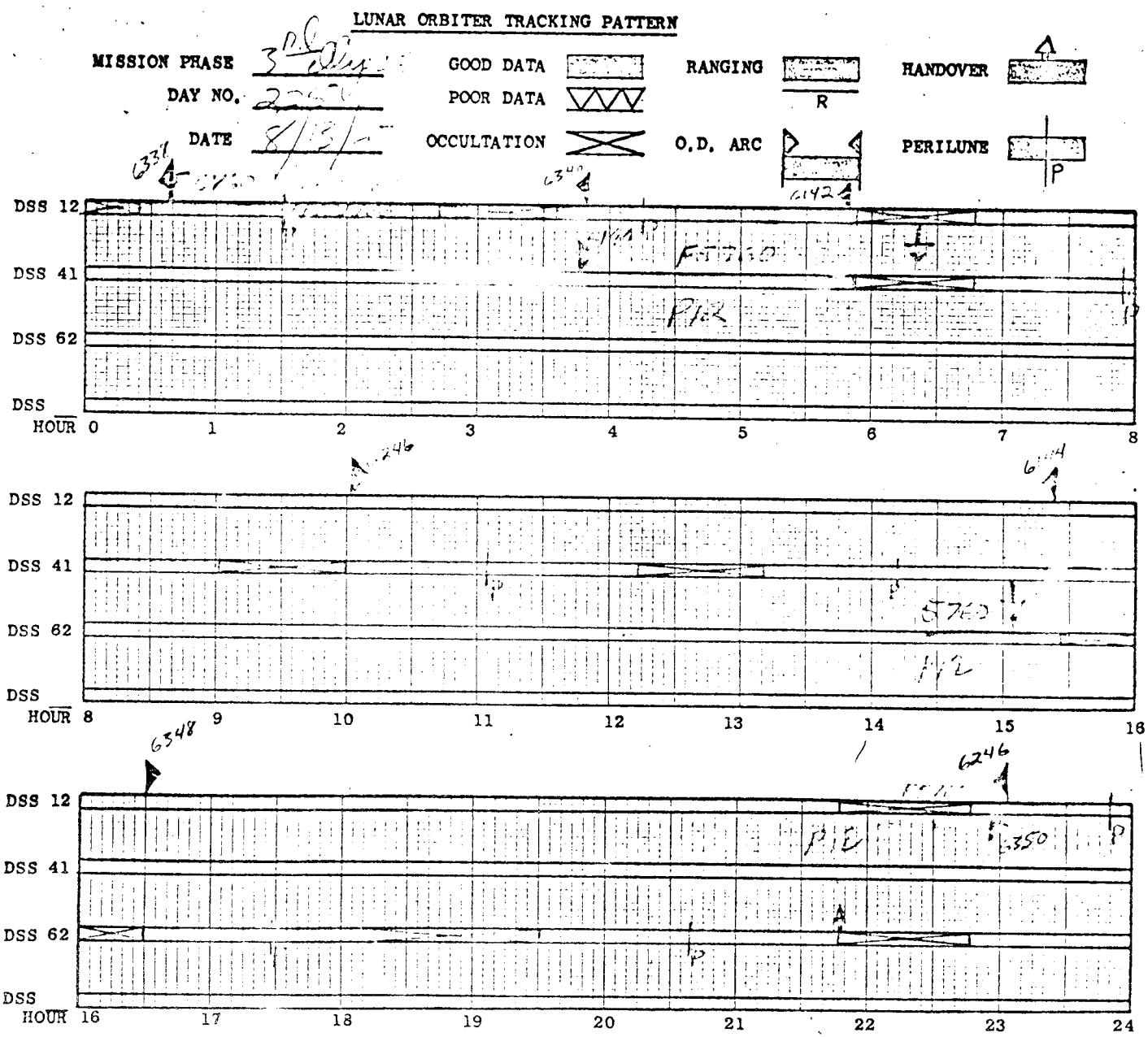
O.D. ARC

HANDOVER

PERILUNE

P




LUNAR ORBITER TRACKING PATTERN
MISSION PHASE
DAY NO.
DATE
GOOD DATA
POOR DATA
OCCULTATION
RANGING
R
O.D. ARC
HANDOVER
PERILUNE
P
DSS 12
DSS 41
DSS 62
DSS
HOUR
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
6338
6340
6142
6246
6348
6350

LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ed.

DAY NO. 2[illegible]6

DATE 8/ /7

GOOD DATA

POOR DATA

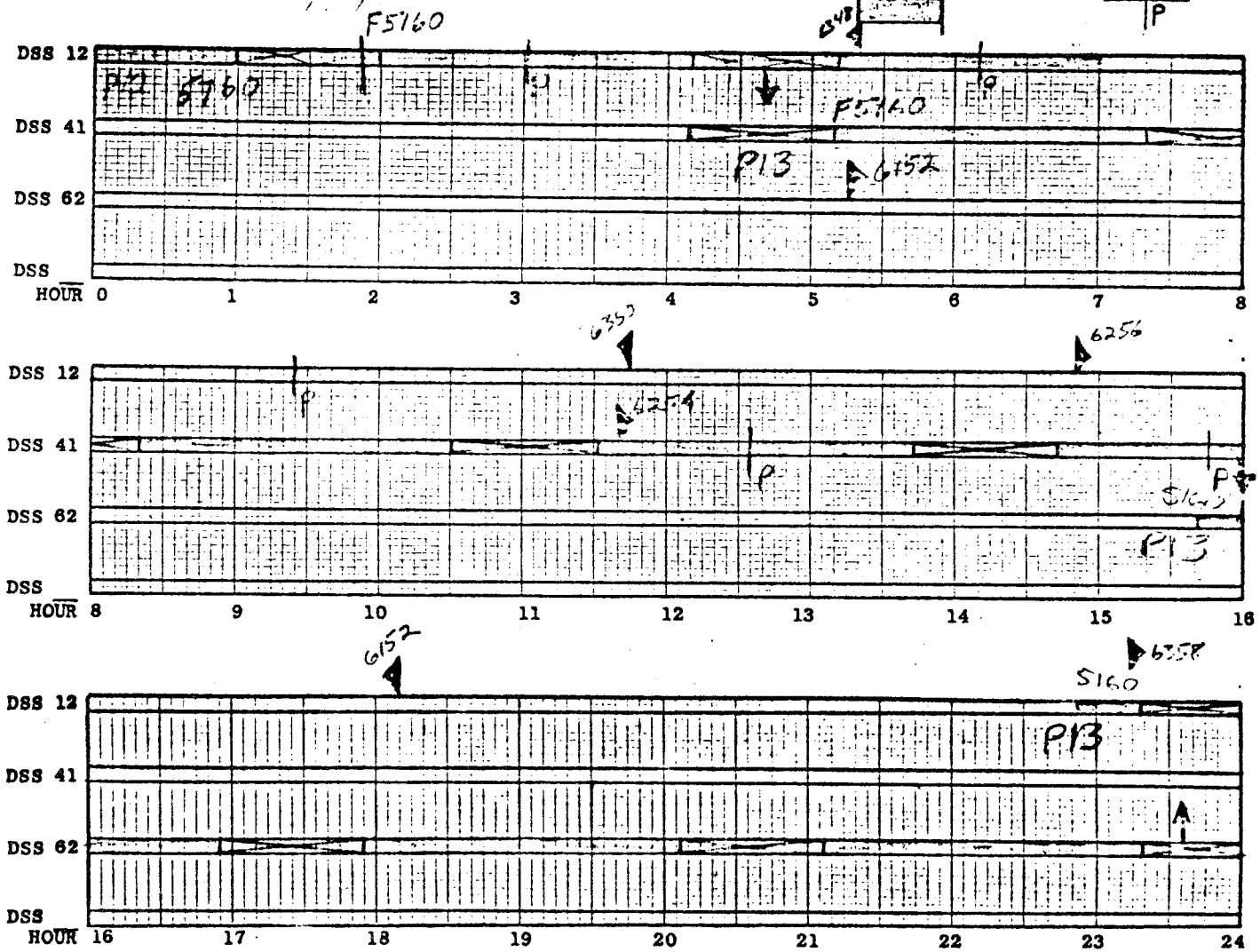
OCCULTATION

RANGING R

O.D. ARC

HANDOVER

PERILUNE P



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE

DAY NO.

DATE

GOOD DATA

POOR DATA

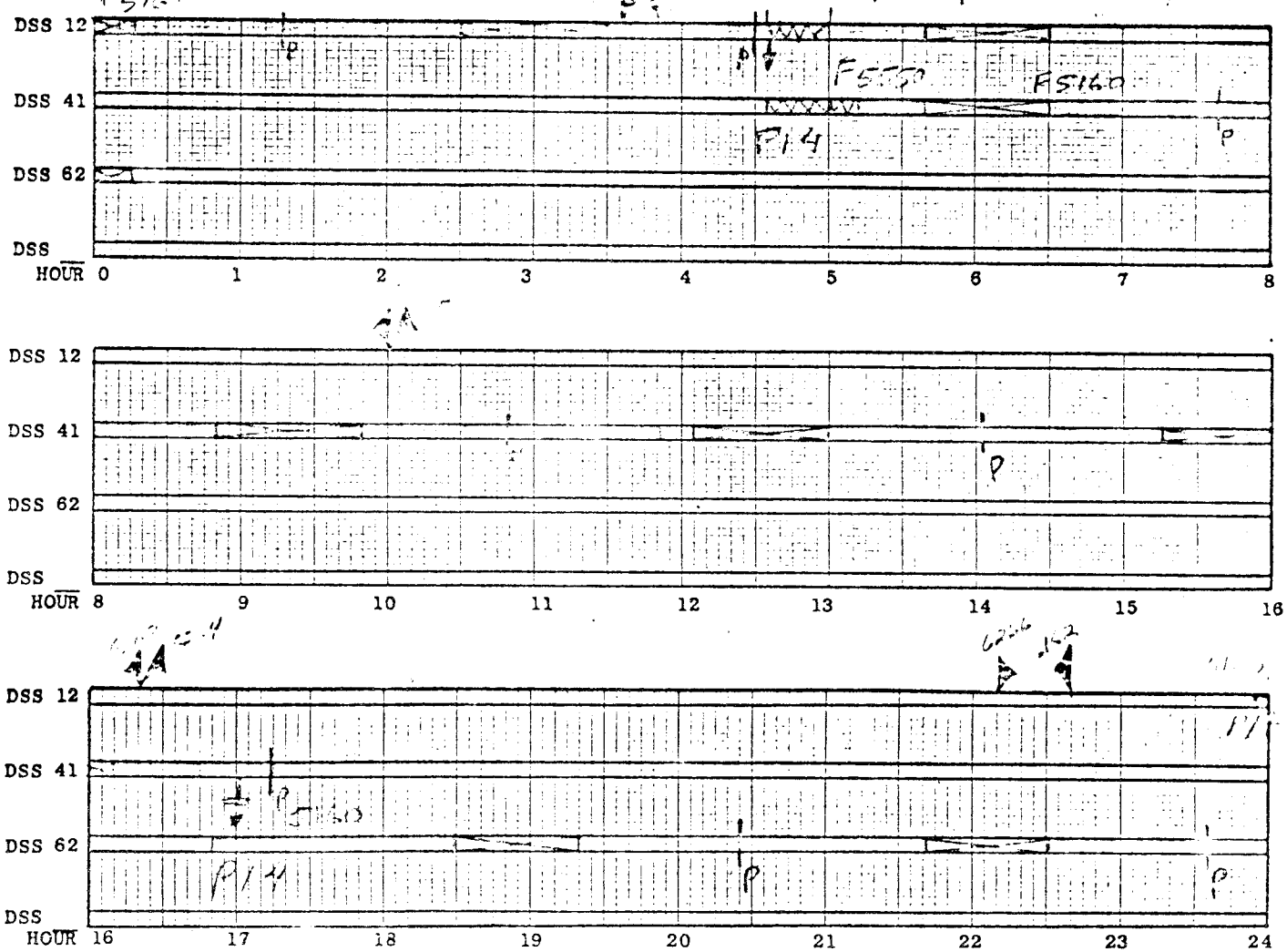
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3 [illegible]

DAY NO. 228

DATE 8/[illegible]

GOOD DATA

POOR DATA

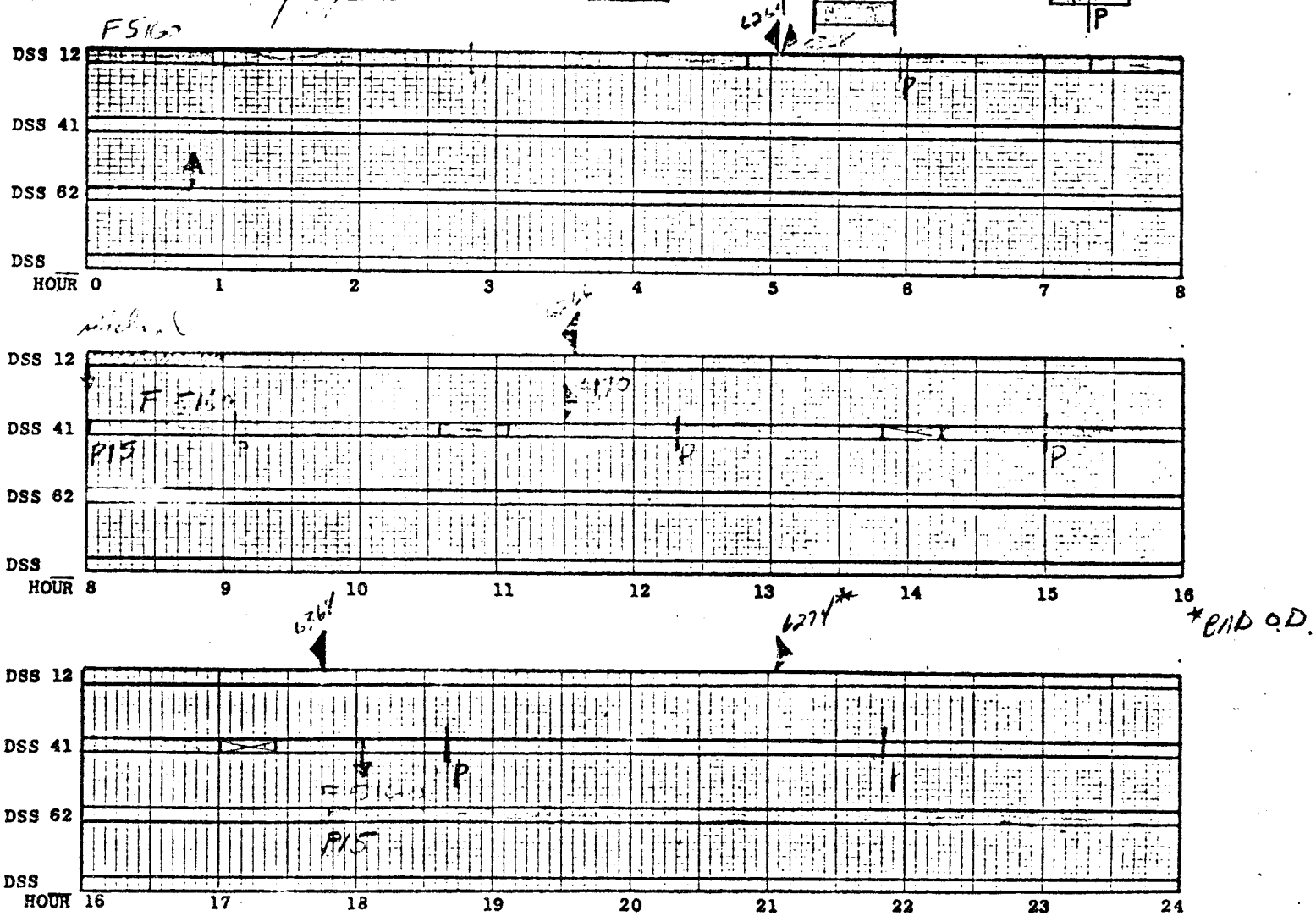
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



*END O.D.

LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd G

DAY NO. 223

DATE 8/17/-7

GOOD DATA

POOR DATA

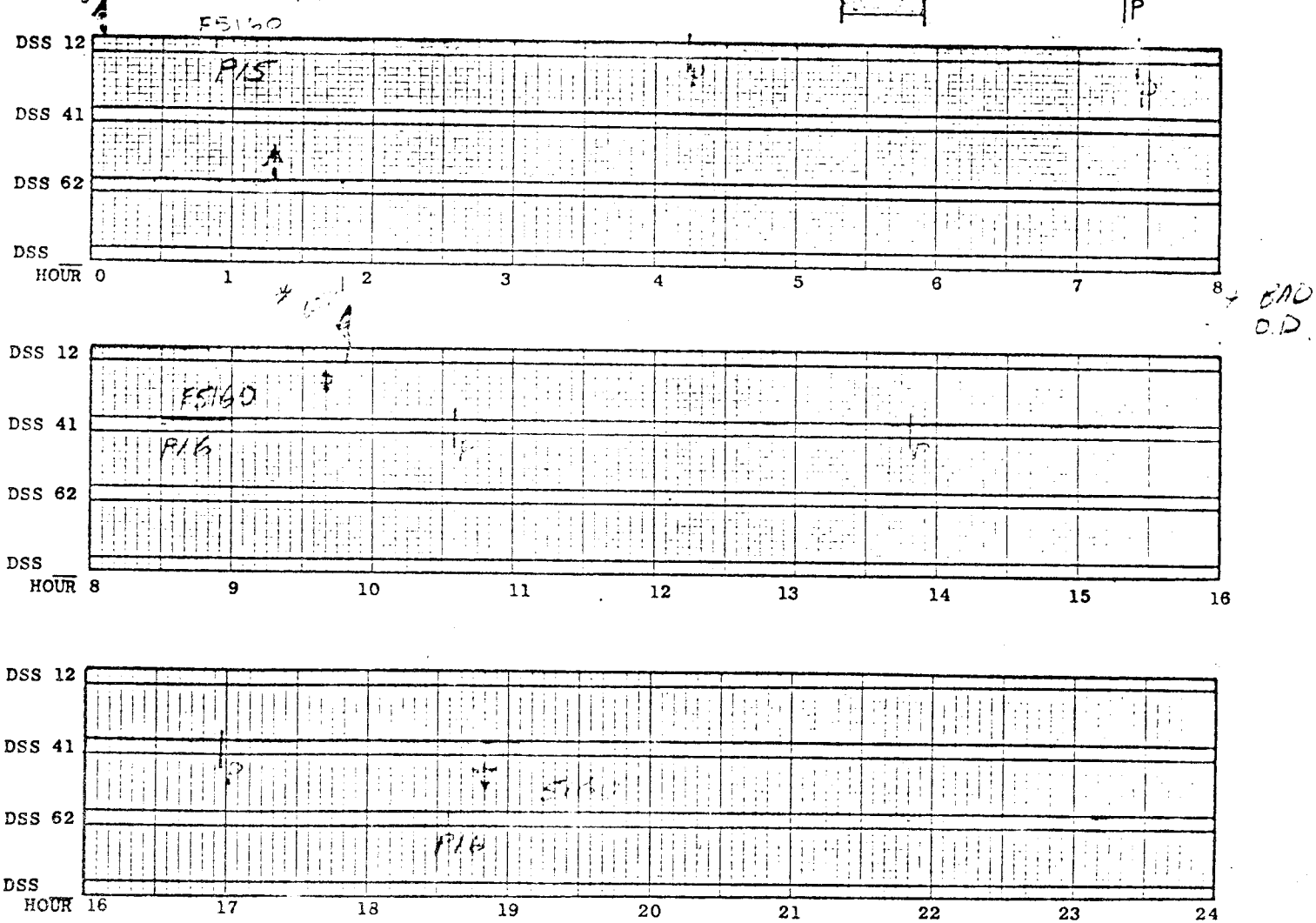
OCCULTATION

RANGING R

O.D. ARC

HANDOVER

PERILUNE P



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 2nd [illegible]

DAY NO. 230

DATE 1/1/1

GOOD DATA

POOR DATA

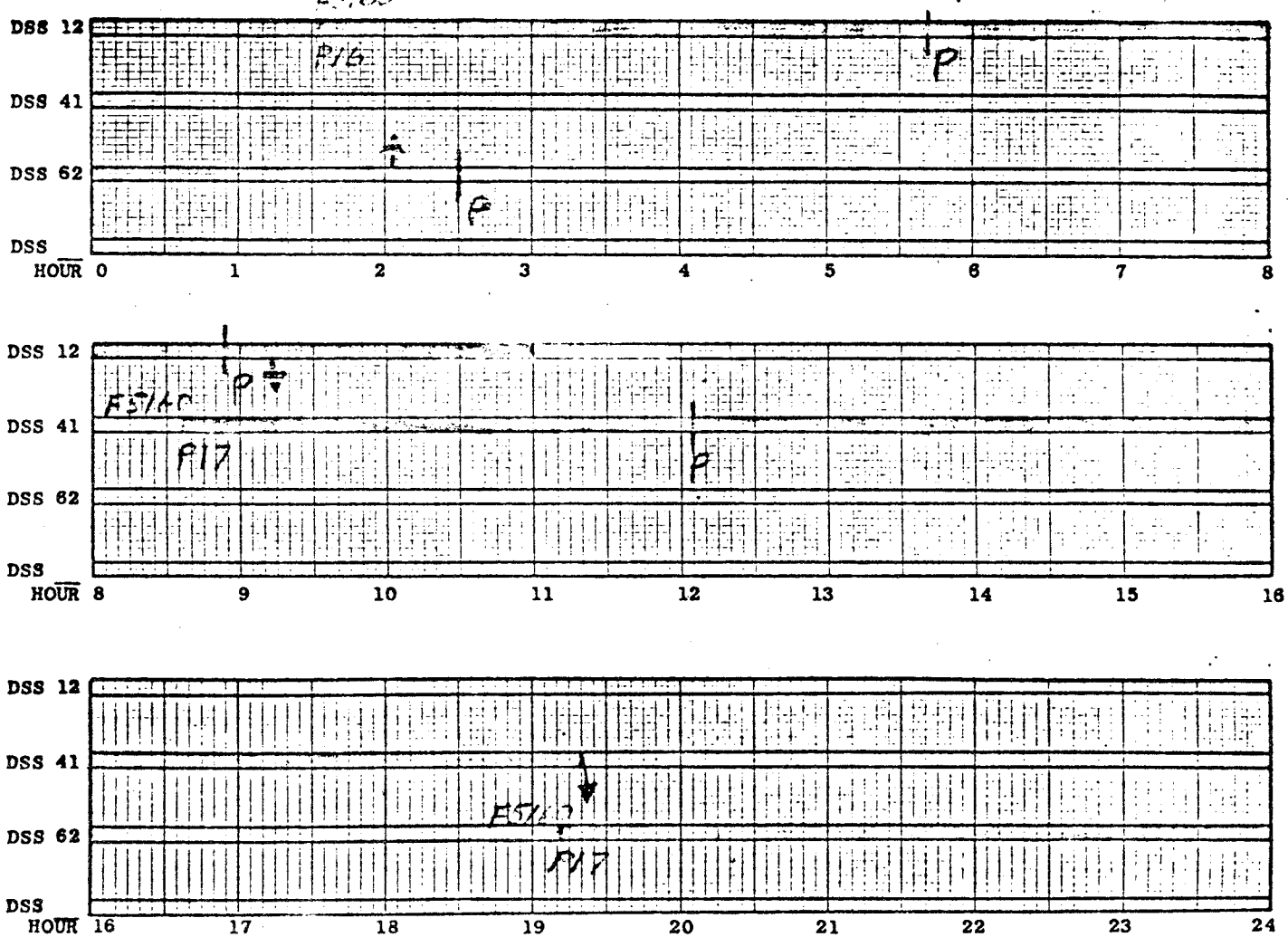
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE [illegible]

DAY NO. [illegible]

DATE [illegible]

GOOD DATA

POOR DATA

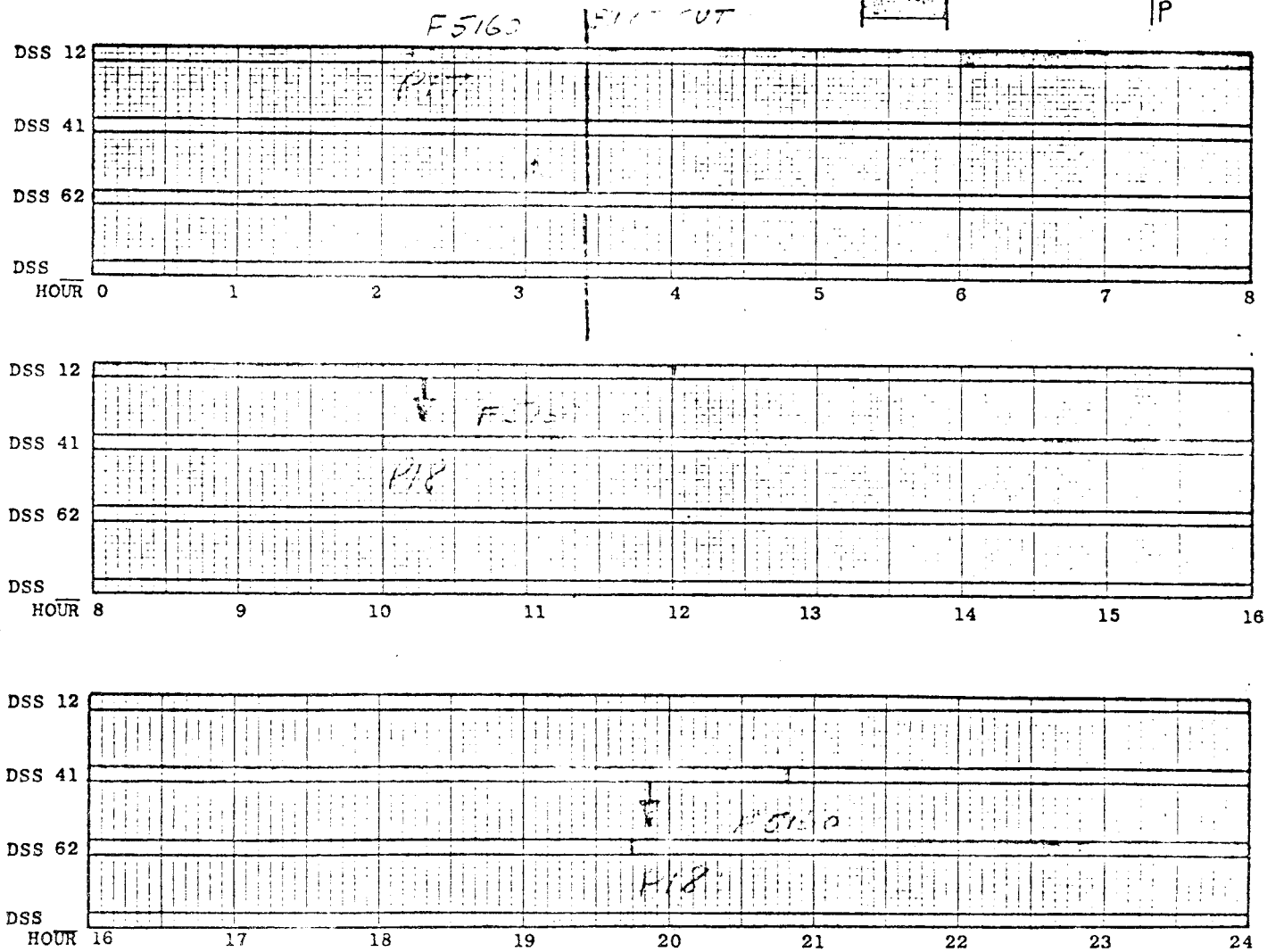
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ellipse

DAY NO. 232

DATE 8/20/67

GOOD DATA

POOR DATA

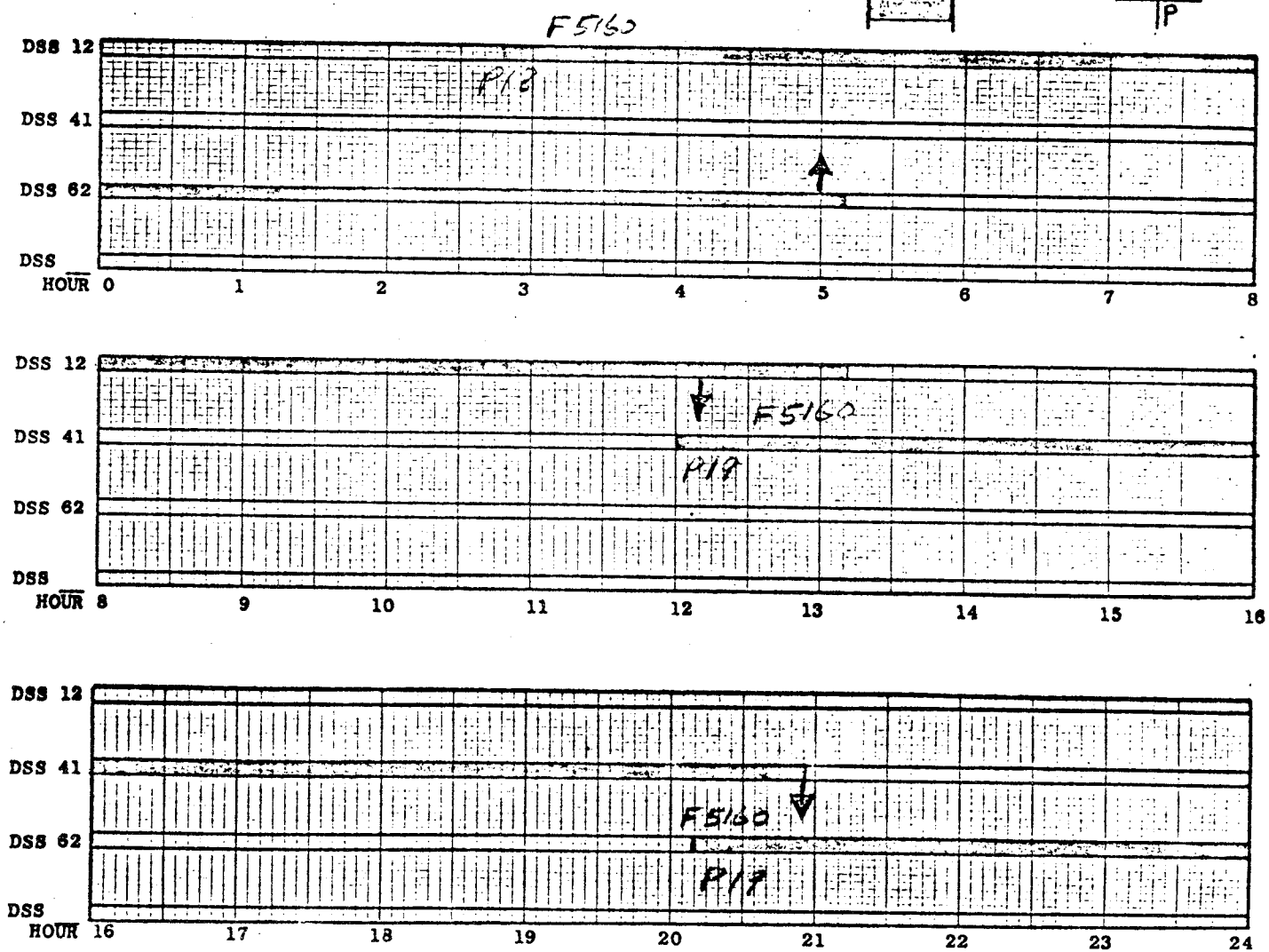
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ellipse

DAY NO. 223

DATE 8/21/67

GOOD DATA

POOR DATA

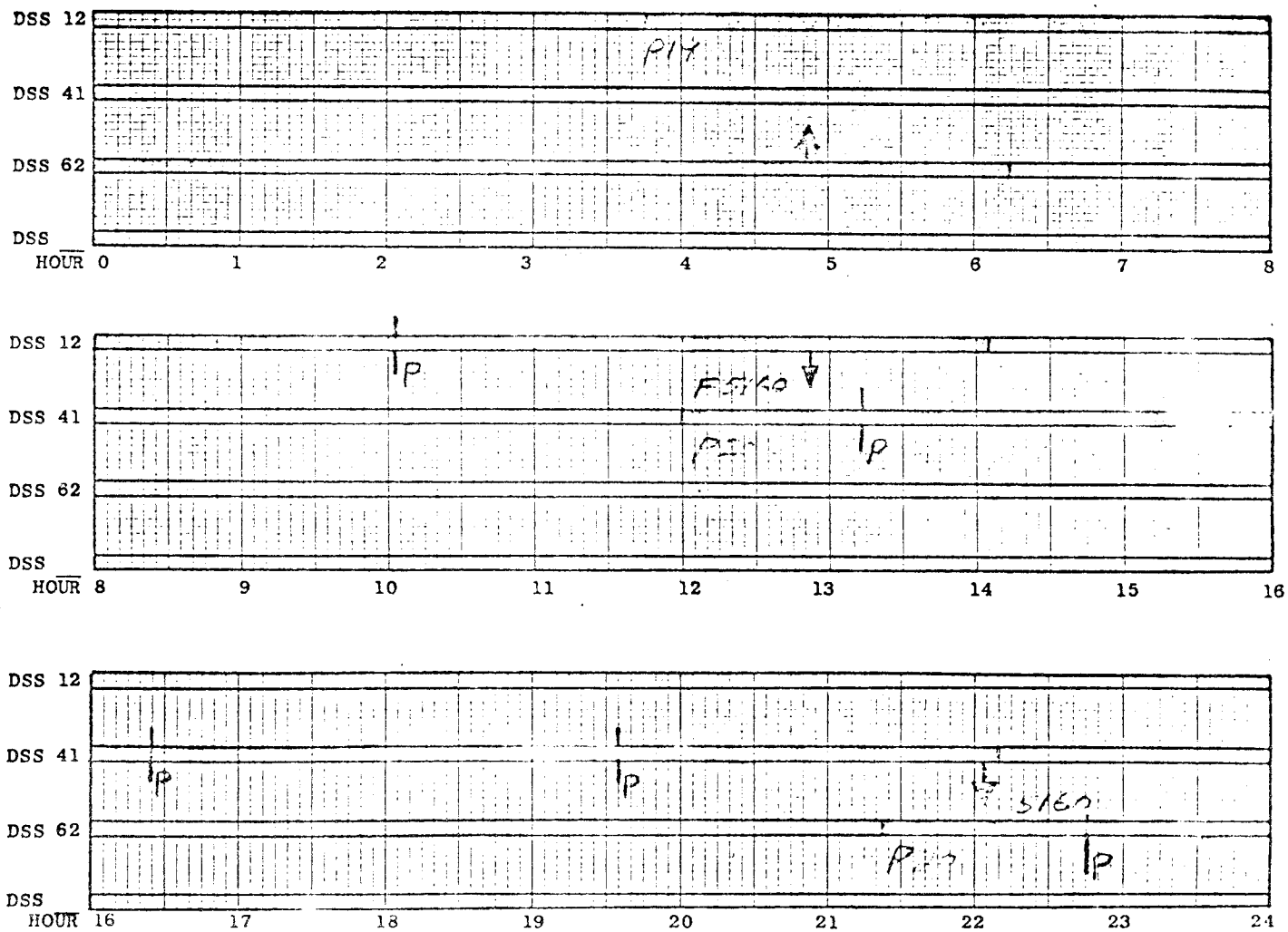
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Stage

DAY NO. 234

DATE 8/22/67

GOOD DATA

POOR DATA

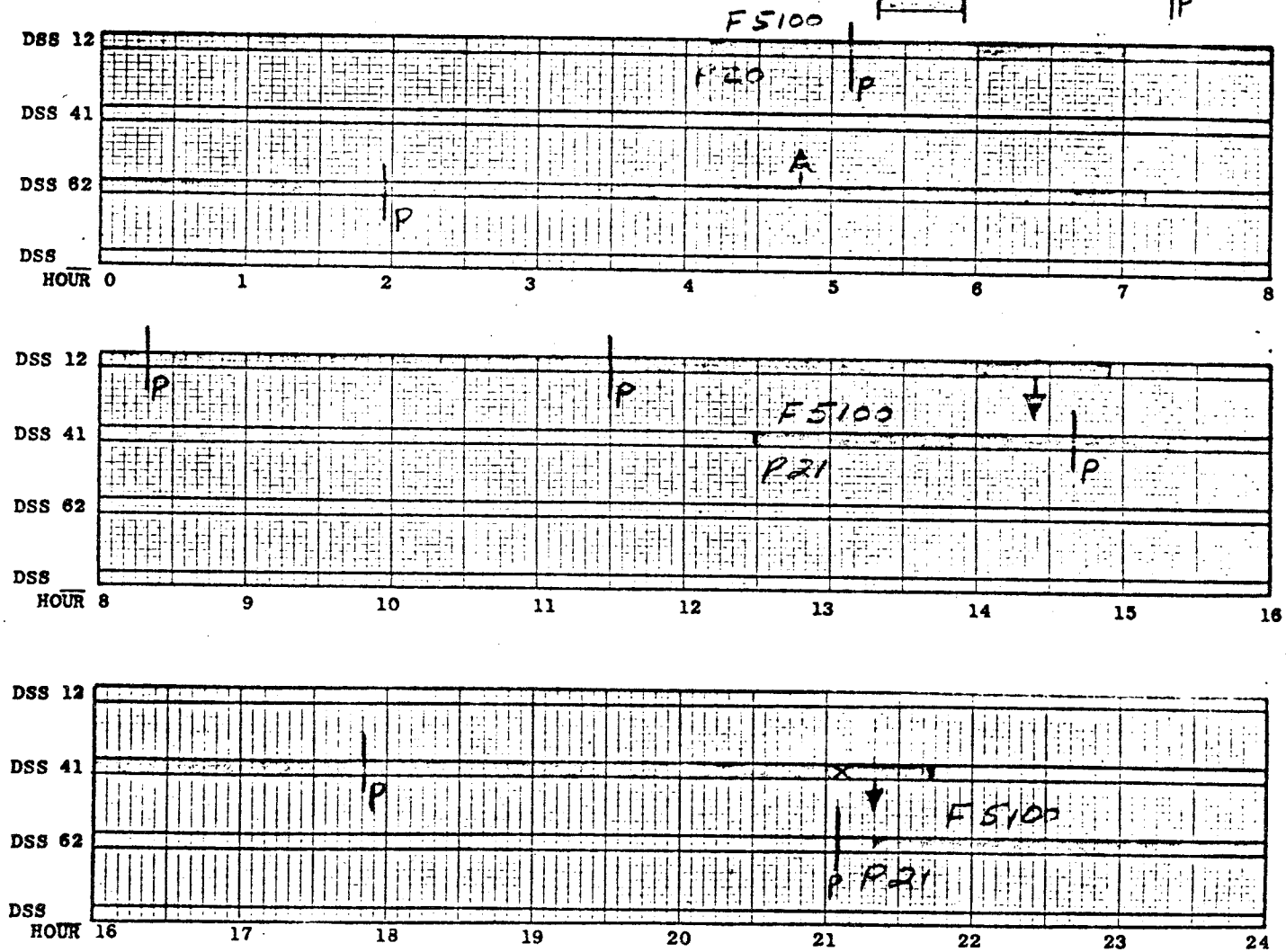
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3 [illegible]

DAY NO. 235

DATE 7/23/67

GOOD DATA

POOR DATA

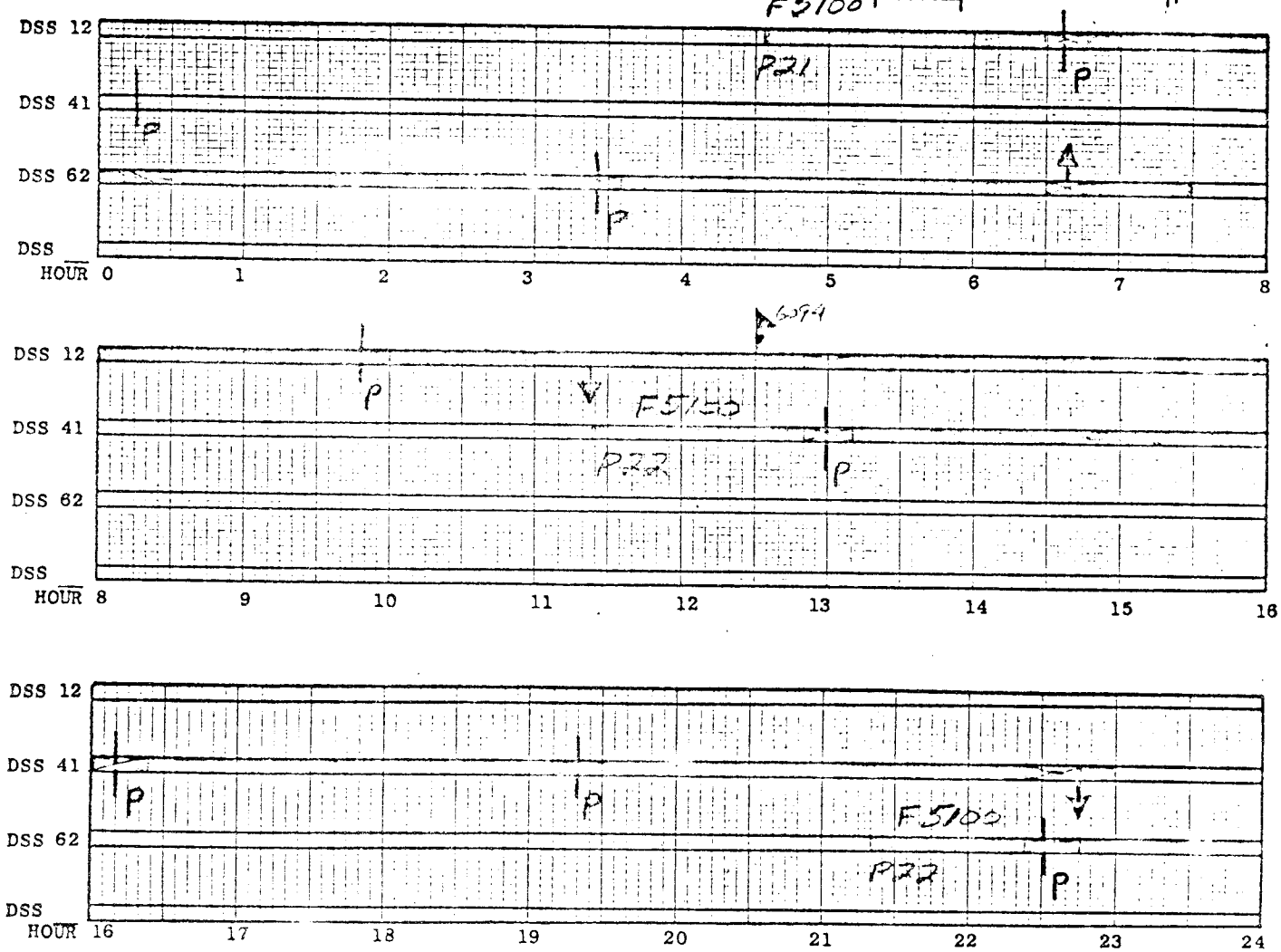
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ellipse

DAY NO. 236

DATE 8/24/67

GOOD DATA

POOR DATA

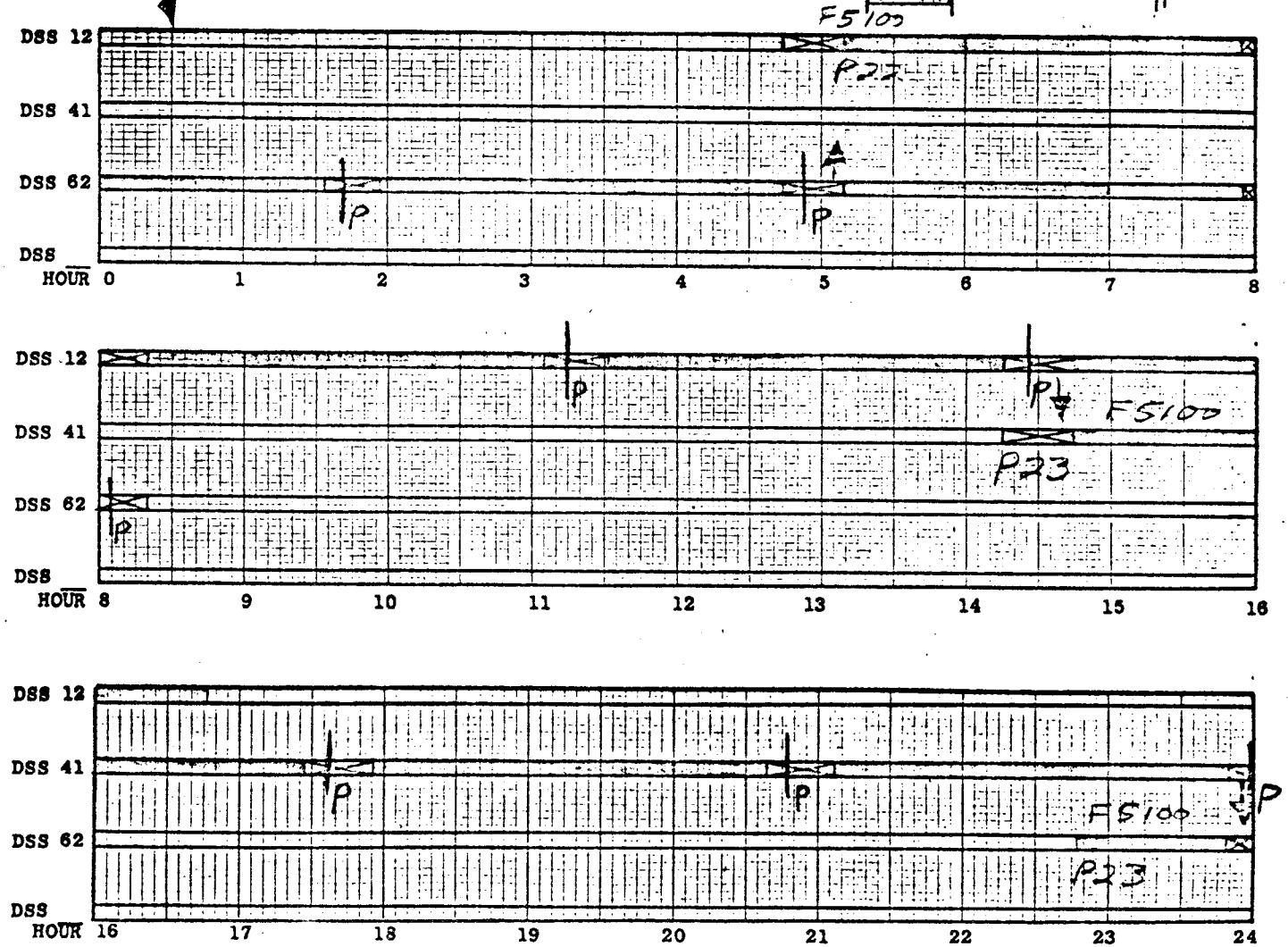
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE [illegible]

DAY NO. [illegible]

DATE [illegible]

GOOD DATA

POOR DATA

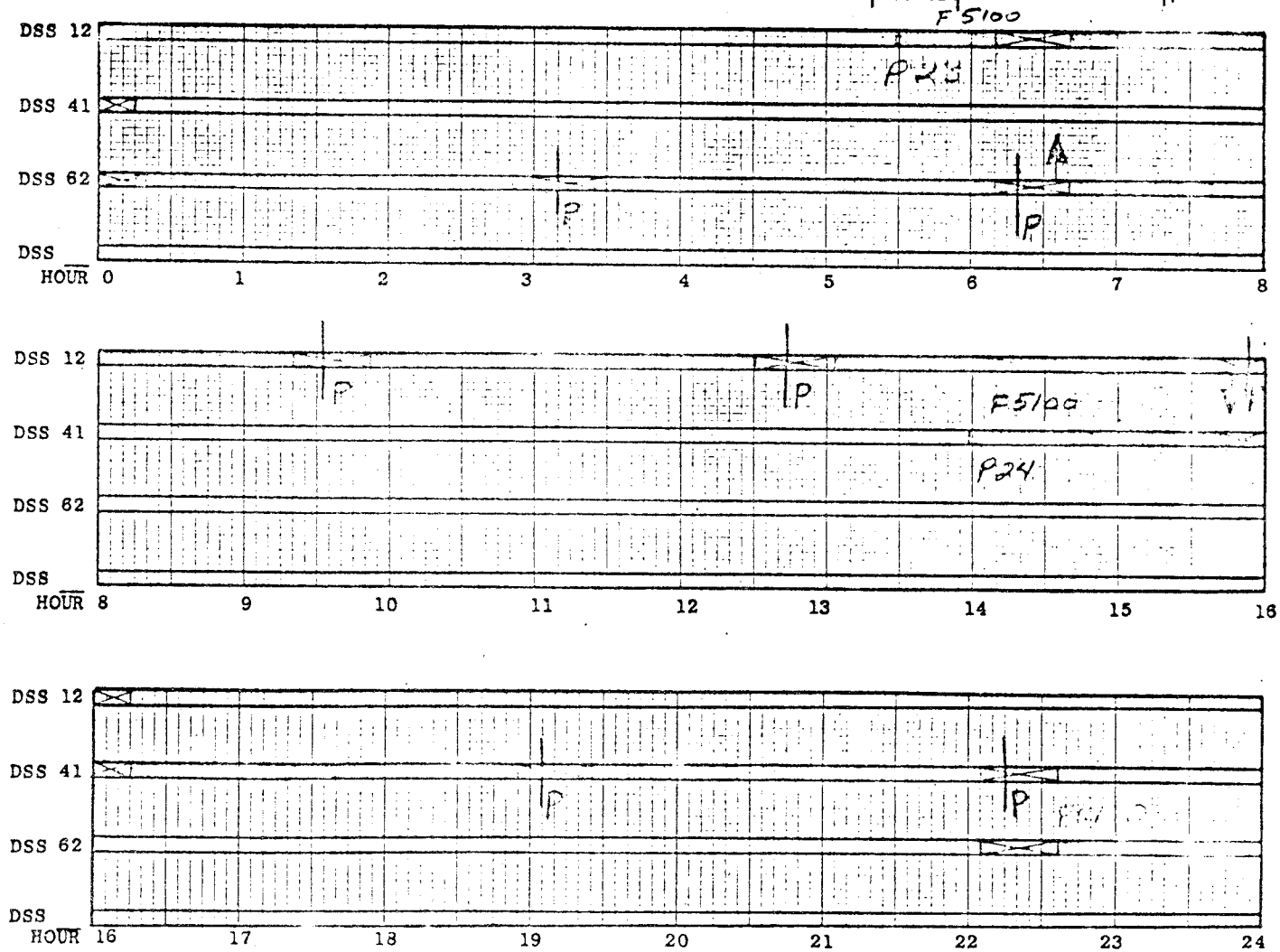
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

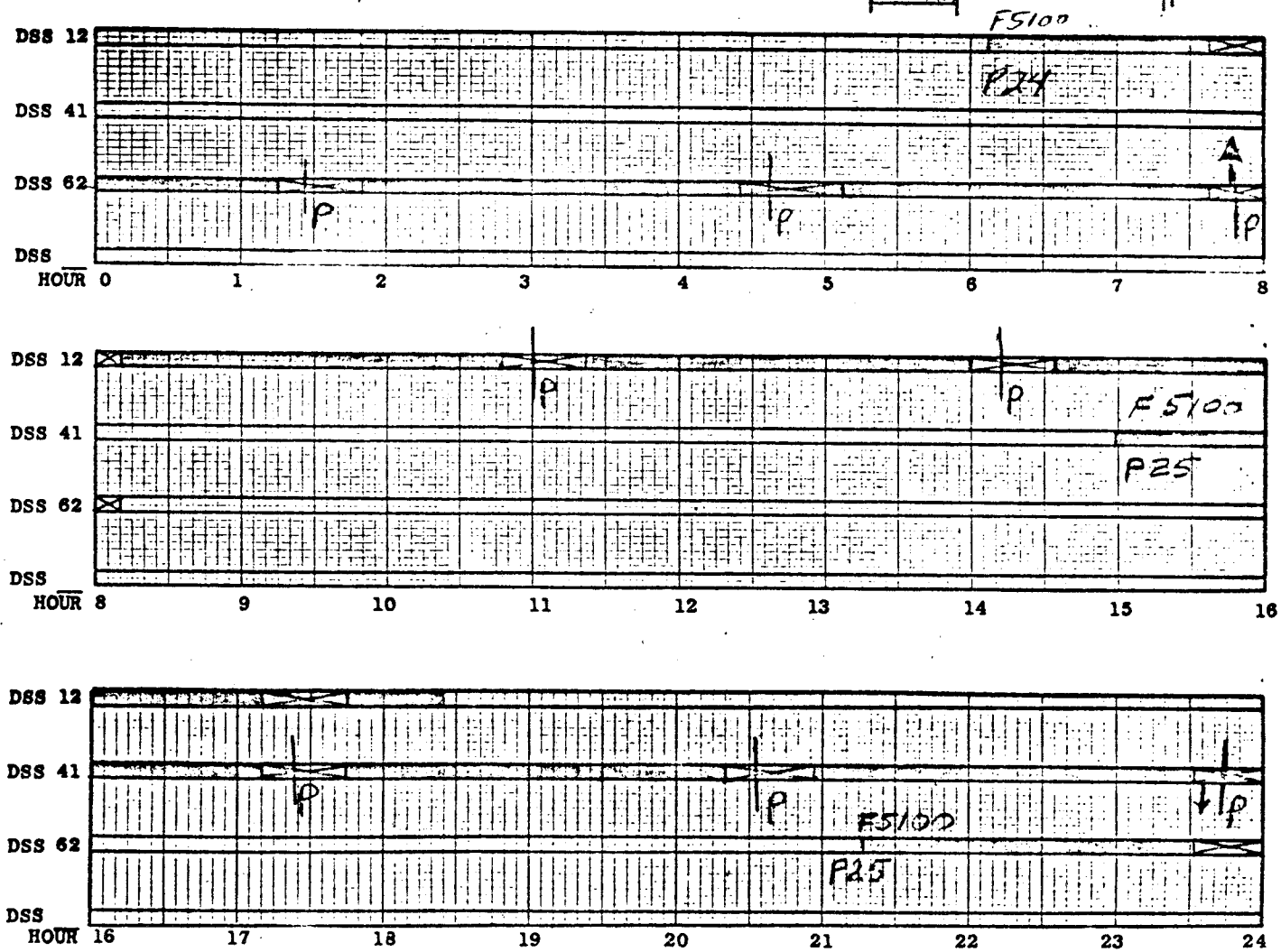
PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ellipse
DAY NO. 238
DATE 8/26/67

GOOD DATA
POOR DATA
OCCULTATION
RANGING (R)
O.D. ARC
HANDOVER
PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE 3rd Ellipse

DAY NO. 239

DATE 8/27/67

GOOD DATA

POOR DATA

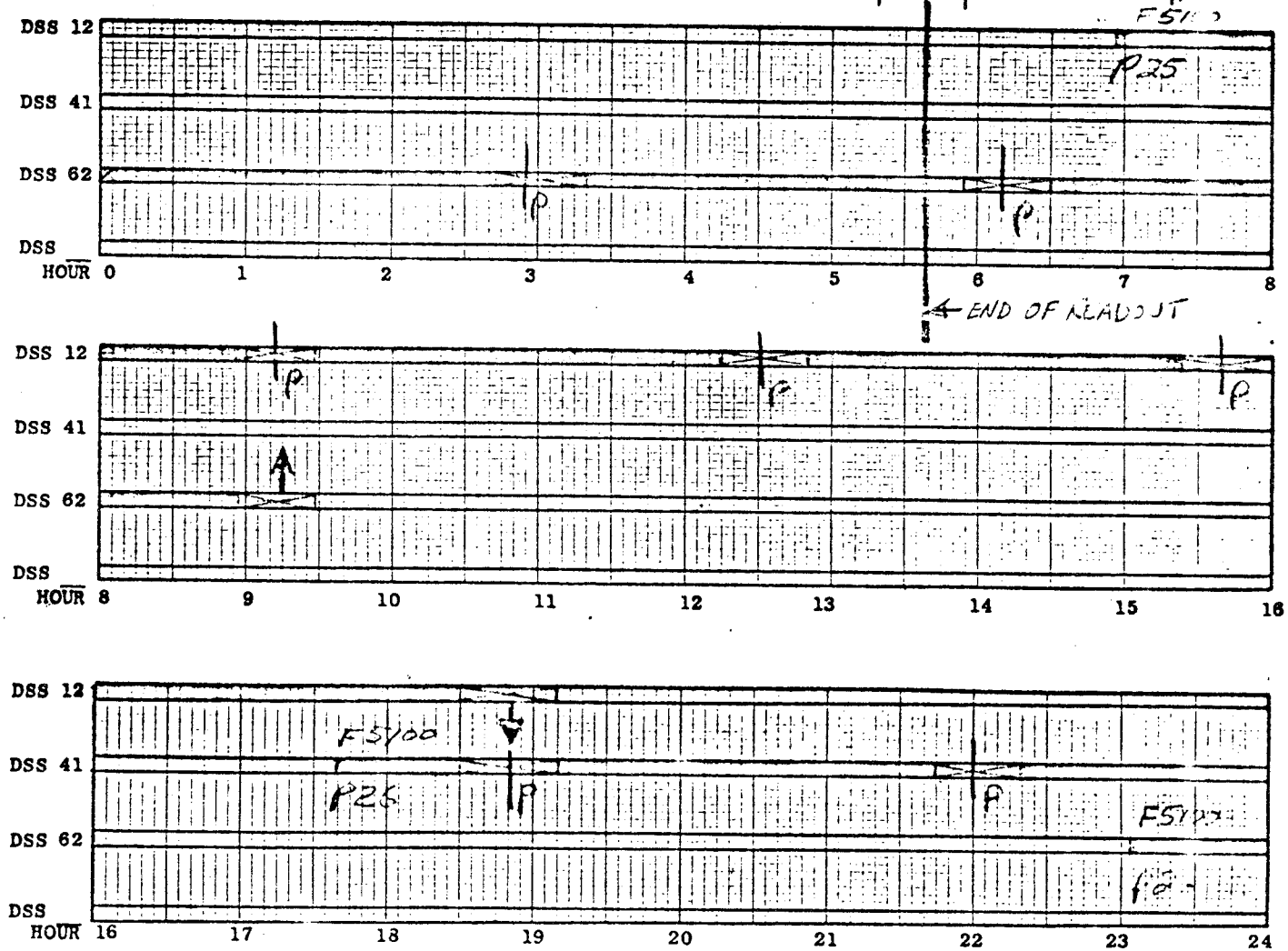
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



LUNAR ORBITER TRACKING PATTERN

MISSION PHASE [illegible]

DAY NO. 240

DATE 8/28/67

GOOD DATA

POOR DATA

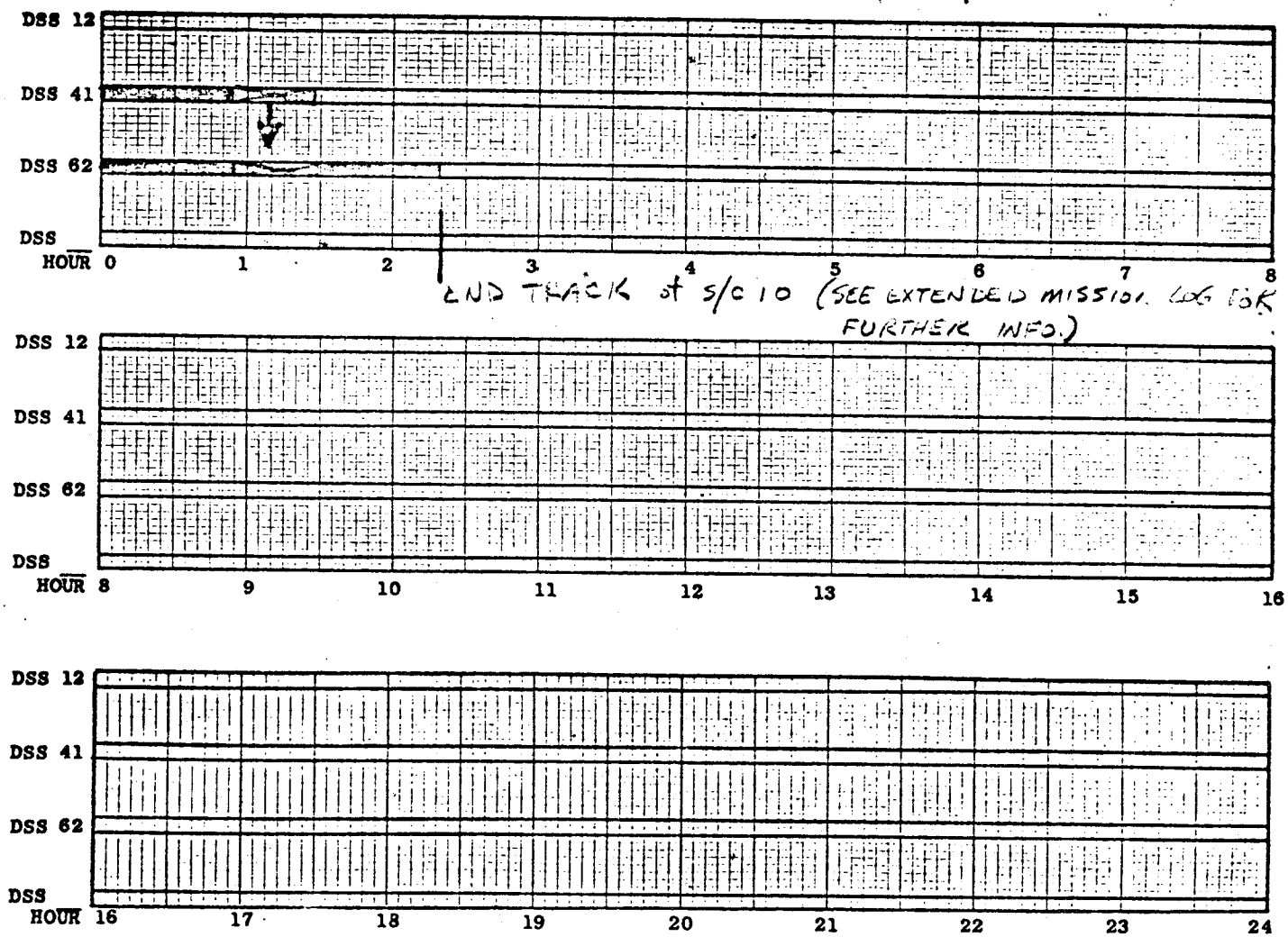
OCCULTATION

RANGING (R)

O.D. ARC

HANDOVER

PERILUNE (P)



ORBIT DETERMINATION RESULTS – CISLUNAR

Orbit Determination Solution Numbering

Each solution obtained by either the project or DSN Orbit Determination OD group is given an appropriate sequence number. This is a four digit number where each digit has the following meaning:

OD Solution ABCD

A indicates the mission phase as follows:
0 - training exercises with live spacecraft
1 - post cislunar injection
2 - post first midcourse
3 - post second midcourse
4 - post lunar injection (first ellipse)
5 - post transfer (second ellipse)
6 - third ellipse or extended mission.

B indicates the OD team obtaining the solution as follows:

1 - Red team
2 - White team
3 - Blue team
0 - Green (extended mission) team

C and D is the solution number, where odd numbers are used by the DSN OD group and even numbers are used by the project OD group. The solution numbers are re-cycled after each change in mission phase.

As an example, OD number 4310 is the fifth project OD solution in first ellipse, and was completed by the Blue team.

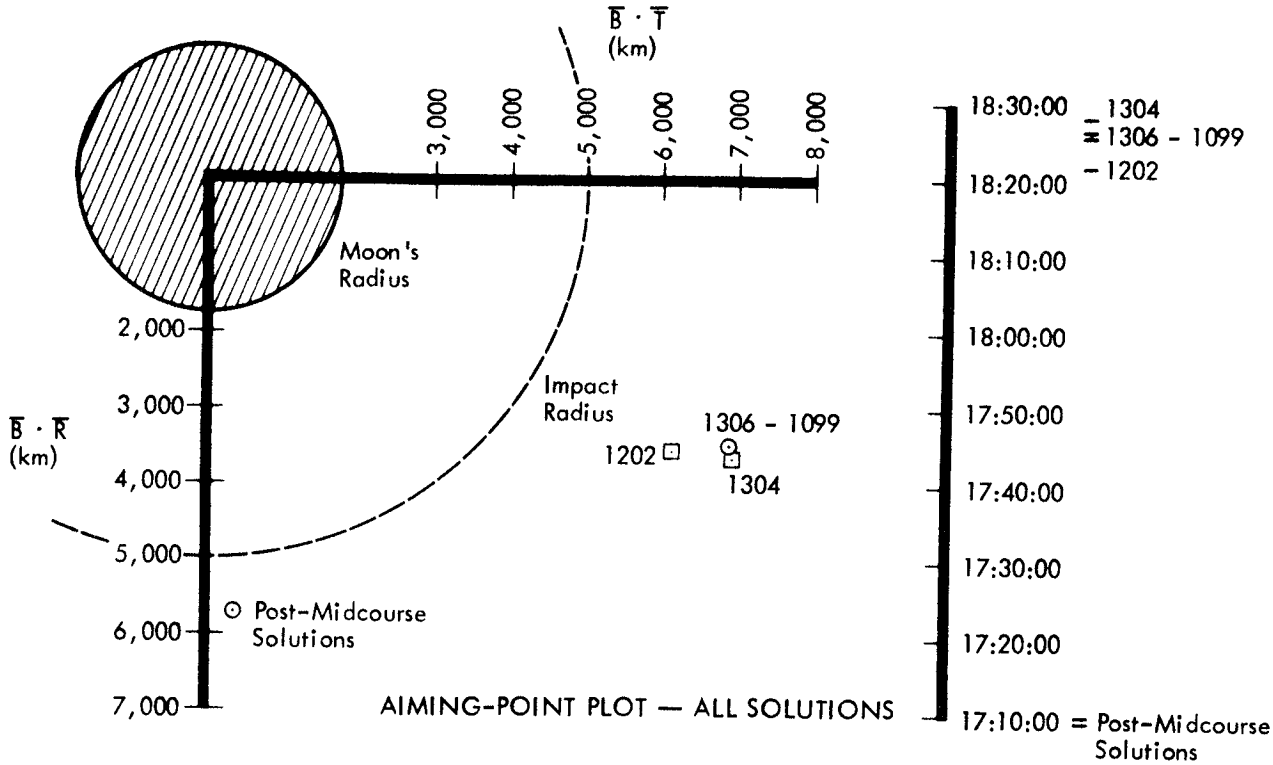
Orbit Determination Procedures

The cislunar phase of Lunar Orbiter Mission V itself can be broken down into four distinct phases, each with its own orbit determination procedures. In the launch phase, only one orbit determination was run by the Project (Boeing) OD team. Because of the short data arc, angles, as well as doppler data, were used. The pre-midcourse phase began with the next OD, which was begun immediately. During this phase, orbit determinations were made by using two-way doppler (CC3) data only; three-way doppler (C3) and ranging (RV) were deweighted and displayed as a check. A special OD, 1099, was run to process all the pre-midcourse phase. This solution used the same data weights as the other pre-midcourse solutions, but station locations and earth gravitational constants were also estimated, instead of state only. Attachment C shows a plot of the resultant aim points from the launch and pre-midcourse solutions.

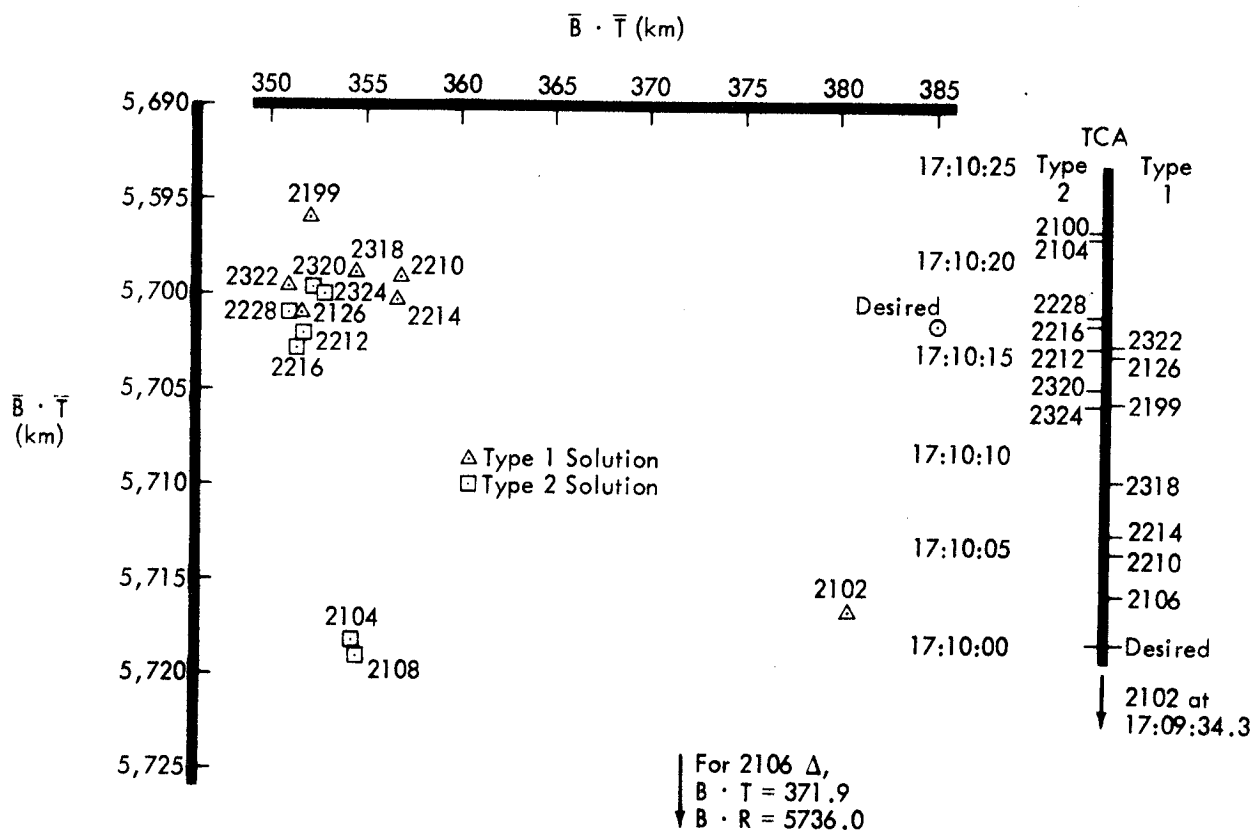
Two solutions were obtained for each data arc in the post-midcourse phase. The first solution used CC3 and RU data, and solved for state only. The second solution used CC3 data only, plus an a-priori covariance matrix, and solved for state and station locations. The covariance matrix was obtained by mapping the covariance matrix of OD 1099 to midcourse time and through the burn and corrupting the velocity variances to reflect maneuver uncertainties.

For the lunar approach phase, the epoch was forwarded to a time approximately 14 hours before deboost, when the spacecraft was influenced primarily by the Moon. The orbit determination program was then operated in Boeing mode, with the Moon as the central body. The resulting selenocentric state vector was mapped to encounter, and used as a check on the earlier geocentric (JPL mode) solutions. Five solutions were obtained; two used CC3 only, but the last three used both CC3 and C3 data. Attachment C shows a plot of the resultant aim points from the past midcourse and approach phase solutions.

OD's 1108 and 1210 were used for the Midcourse Maneuver Preliminary and Final Command Conferences, and OD's 2126 and 2228 were used for the Deboost Maneuver Preliminary and Final Command Conferences.



AIMING-POINT PLOT — ALL SOLUTIONS



AIMING-POINT PLOT — POST-MIDCOURSE SOLUTIONS

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 12561

5.1 O. D. IDENTIFICATION NO. 1099 ITEM NO. _____

5.2 EPOCH: DAY 213, 23 : 30 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X 7148.8196 km $\dot{X}$ -.5524995 km/sec
Y 9081.2811 km $\dot{Y}$ 7.8693753 km/sec
Z -4433.4982 km $\dot{Z}$ .2608169 km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX 102.2 m $\sigma\dot{x}$ .061 m/sec σX _____ m $\sigma\dot{x}$ _____ m/sec
σY 55.3 m $\sigma\dot{y}$ .014 m/sec σY _____ m $\sigma\dot{y}$ _____ m/sec
σZ 219.5 m $\sigma\dot{z}$ .095 m/sec σZ _____ m $\sigma\dot{z}$ _____ m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B 7716.1115 km σB 8.1988077 km
B·T 6827.6862 km σB·T 6.5188207 km
B·R 3478.2478 km σB·R 4.9724666 km
Rp 3847.528 km σRp 4.0351653 km
TCA 217/18:28:06.2 gmt σTCA 3.2838342 sec

5.7 DATA ARC LENGTH: 30.3 hrs

505 = 20.8

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	8/02-0811	8/02-1355	219	5.58	-9.53
	C3	8/02-0449	8/02-1558	157	.0232	.00506
	CC3	8/02-0603	8/02-1357	425	.0127	-.00025
	C3	8/03-0307	8/03-0548	36	.025	-.28
41	RU	8/02-0051	8/02-0454	206	3.98	-8.98
	C3	8/02-0602	8/02-0542	26	.015	-.0264
	CC3	8/01-2331	8/02-0538	364	.0185	-.000446
	RU	8/02-0116	8/02-0224	83	4.77	-1.73
	C3	8/02-2200	8/02-2257	52	.00469	.0309
	CC3	8/02-2303	8/02-0548	319	.00415	-.000203
51	C3	8/02-0340	8/02-0522	69	.012	-.00485
12	RU	8/02-1539	8/02-2254	267	4.33	-45.3
	C3	8/02-1801	8/02-[illegible]	103	.0164	-.0117
	CC3	8/02-1402	8/02-2259	502	.00391	-.00113

5.9 RESIDUAL PLOTS: TAPE NO. 11465 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

PREPARED BY: E. Hamilton for LEE BUNCE R W D
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 1162 4

5.1 O. D. IDENTIFICATION NO. 1108 ITEM NO. _____

5.2 EPOCH: DAY 213, 23 : 30 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X 7148.8107 km $\dot{X}$ -.55250359 km/sec
Y 9081.3204 km $\dot{Y}$ 7.8698686 km/sec
Z -4433.4785 km $\dot{Z}$ .2608806 km/sec

5.4 STANDARD DEVIATIONS:

				APRIORI	
σX 313.4 m	$\sigma\dot{x}$ .166 m/sec	σX	m	$\sigma\dot{x}$	m/sec
σY 124.8 m	$\sigma\dot{y}$ .051 m/sec	σY	m	$\sigma\dot{y}$	m/sec
σZ 647.6 m	$\sigma\dot{z}$ .151 m/sec	σZ	m	$\sigma\dot{z}$	m/sec

5.5 APPROACH HYPERBOLA:

B 7708.5721 km
B·T 6881.4576 km
B·R 3473.8528 km
Rp 3841.7193 km
TCA 217:18:28:01.29 gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB 25.493011 km
σB·T 15.898688 km
σB·R 19.928003 km
σRp 11.790352 km
σTCA 7.6576275 sec

5.7 DATA ARC LENGTH: 9.85 hrs

SOS = 26, 46

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	8/02-0811	8/02-0939	44	5.06	48.8
	C3	8/02-0449	8/02-0553	50	.0386	-.295
	CC3	8/02-0603	8/02-0939	185	.0164	-.0007
41	RU	8/02-0051	8/02-0454	236	4.48	-6.0
	C3	8/02-0605	8/02-0650	38	.0232	.311
	CC3	8/01-2331	8/02-0558	269	.0236	.0005

5.9 RESIDUAL PLOTS: TAPE NO. 1195 6 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

PREPARED BY: E. J. Hamilton (R) W B
OD ANALYST

5. ORBIT DETERMINATION RESULTS (TRANSLUNAR)

TAPE NO. 4473

5.1 O. D. IDENTIFICATION NO. 1202 ITEM NO. [illegible]

5.2 EPOCH: DAY 213, 23 hr :05 min :52.3 sec (GMT)

5.3 STATE VECTOR (GEOC. 1950.0):

X 4511.9409	km	$\dot{X}$ 5.774271	km/sec
Y -3946.5165	km	$\dot{Y}$ 8.539249	km/sec
Z -2695.7516	km	$\dot{Z}$ -3.601003	km/sec

5.4 STANDARD DEVIATIONS:

				APRIORI			
σX 3654	m	σẋ [illegible]	m/sec	σX 0	m	σẋ 0	m/sec
σY 1942	m	σẏ —	m/sec	σY 0	m	σẏ 0	m/sec
σZ 2201	m	σż 3.3	m/sec	σZ 0	m	σż 0	m/sec

5.5 APPROACH HYPERBOLA:

B	7074.483	km
B·T	6128.177	km
B·R	3534.651	km
Rp	3347.241	km
TCA	217/18:25:42.8	gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB	613.	km
σB·T	447.	km
σB·R	419.	km
σRp	194.	km
σTCA	97.5	sec

5.7 DATA ARC LENGTH: 27 min ~~hrs~~

SOS = 9.31

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME DAY 20	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
41	HA	23:24	[illegible]	8	.004	[illegible]
41	DEC	23:24	23:51	58	.013	.0042
41	CC3	23:24	23:51	55	.127	.0023

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Prel. OD since initial problems caused this run to be lost.

214:01:18

PREPARED BY: [illegible] R W B

OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11523

5.1 O. D. IDENTIFICATION NO. 1210 ITEM NO. 69

5.2 EPOCH: DAY 213, 23 : 32 : 0[illegible] (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X 7148.9394 km $\dot{X}$ -.5524 2[illegible] km/sec

Y 9081.2624 km $\dot{Y}$ 7.8698914 km/sec

Z -4433.2[illegible] km $\dot{Z}$ .26[illegible] km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX 217. m σ$\dot{x}$ .112 m/sec σX | m σ$\dot{x}$ | m/sec

σY 79.3 m σ$\dot{y}$ .030 m/sec σY | m σ$\dot{y}$ | m/sec

σZ 475. m σ$\dot{z}$ .142 m/sec σZ | m σ$\dot{z}$ | m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B 7713.301 km σB 18.893 km

B·T 6883.030 km σB·T 11.[illegible]6 km

B·R 3481.223 km σB·R 15.356 km

Rp 3845.333 km σRp 10.570 km

TCA 217, 18:28:04.6 gmt σTCA 7.129 sec

5.7 DATA ARC LENGTH: 16.65 hrs

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME 214	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	044932	155[illegible], 214	157	.031	-.25
62	CC3	060332	135832, 214	427	.027	-.005
41	RU	005102	045402, 214	236	5.91	-43.9
41	C3	060532	06[illegible], 214	38	.023	.331
41	CC3	233101, 213	055832, 214	3[illegible]9	.025	.077
51	C3	034032	080232, 214	197	.150	-1.26
12	RU	1[illegible]	161102, 214	3[illegible]	4.47	1.87
12	C3	13[illegible]132	135732, 214	57	.015	.226
12	CC3	140232	161032, 214	112	.014	-.074

5.9 RESIDUAL PLOTS: TAPE NO. 12547 ITEM NO. 70

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Good O.D. Range units weighted at 200., C3 weighted at 10. which essentially removed [illegible] the fit. The agreement with previous O.D.'s is good. SOS = 48.355

214: 18:50

PREPARED BY: J W Underwood R (W) B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11937

5.1 O. D. IDENTIFICATION NO. 1212 ITEM NO. 76C

5.2 EPOCH: DAY 213 , 23 : 30 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	7148.9706	km	$\dot{X}$	-.55241598	km/sec
Y	9081.2538	km	$\dot{Y}$	7.8698977	km/sec
Z	-4433.1498	km	$\dot{Z}$	.26089096	km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX	205.65	m	$\sigma\dot{x}$	.10513	m/sec	σX		m	$\sigma\dot{x}$		m/sec
σY	66.72	m	$\sigma\dot{y}$	.02601	m/sec	σY		m	$\sigma\dot{y}$		m/sec
σZ	458.98	m	$\sigma\dot{z}$	.12338	m/sec	σZ		m	$\sigma\dot{z}$		m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B	7713.7841	km	σB	16.82181	km
B·T	6882.9933	km	σB·T	14.43726	km
B·R	3482.3653	km	σB·R	8.63358	km
Rp	3845.8407	km	σRp	10.29673	km
TCA	217/18:08:05.503	gmt	σTCA	7.0791	sec

5.7 DATA ARC LENGTH: 30 / hrs SOS = 44.065

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	[illegible]	[illegible]	219	.5.32	31.6
	C3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	CC3	24/[illegible]	[illegible]	[illegible]	.0179	.00251
41	RU	[illegible]	[illegible]	[illegible]	[illegible]	-50.9
	C3	[illegible]	[illegible]	[illegible]	.0199	.00249
	CC3	[illegible]	[illegible]	369	.0230	.0117
12	RU	214/[illegible]	214/[illegible]	167	5.57	-.503
	C3	214/[illegible]	[illegible]	57	.00553	-.0233
	CC3	214/[illegible]	[illegible]	324	.0110	-.00846
51	C3	214/054032	214/080237	197	[illegible]	-1.26

5.9 RESIDUAL PLOTS: TAPE NO. 555 Y ITEM NO. 82-A

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: VERY [illegible] FIT. DATA WEIGHTS — CC3 = .1, C3 = 10, RU = 2000. NO [illegible] ADJUSTMENT FOR DSS 51. TERMINATED SW. 22 [illegible] 89.

PREPARED BY: [signature] R (W) B
OD ANALYST

5. [illegible] ([illegible])

TAPE NO. 11474 [illegible]

5.1 O. D. IDENTIFICATION NO. [illegible] ITEM NO. 446

5.2 EPOCH: DAY 21[illegible], [illegible] : [illegible]5 : 5[illegible].3 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	4500.010[illegible]	km	$\dot{X}$	5.79[illegible]	km/sec
Y	-39[illegible].6537	km	$\dot{Y}$	8.[illegible]17[illegible]	km/sec
Z	-2672.8947	km	$\dot{Z}$	-3.605[illegible]	km/sec

5.4 STANDARD DEVIATIONS:

σX	18[illegible]6	m	$\sigma\dot{x}$	39.77	m/sec	σX		m	$\sigma\dot{x}$		m/sec
σY	11153	m	$\sigma\dot{y}$	12.45	m/sec	σY		m	$\sigma\dot{y}$		m/sec
σZ	20522	m	$\sigma\dot{z}$	3.05	m/sec	σZ		m	$\sigma\dot{z}$		m/sec

APRIORI

5.5 APPROACH HYPERBOLA:

B	78[illegible].6[illegible]6	km
B·T	[illegible].5304	km
B·R	3[illegible]1.6177	km
Rp	3[illegible].4161	km
TCA	217/[illegible]	gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB	[illegible]	km
σB·T	[illegible]6	km
σB·R	877.34[illegible]	km
σRp	7[illegible].9[illegible]711	km
σTCA	[illegible].97[illegible]7	sec

5.7 DATA ARC LENGTH: _____ hrs

SOS = 19.61

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
41	[illegible]	21[illegible]	21[illegible]/21[illegible]	[illegible]	[illegible]	.001

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: [illegible] $\vec{X}$ [illegible] TO [illegible] 20 [illegible] AFTER [illegible]. STATE [illegible] [illegible]

PREPARED BY: [illegible] R W (B)
OD ANALYST

5. ORBIT [illegible] (TRANS[illegible])

TAPE NO. 11917

5.1 O. D. IDENTIFICATION NO. 1306 ITEM NO. _____

5.2 EPOCH: DAY 213, 23 : 30 : 0 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X 7148.7617 km $\dot{X}$ -.55246661 km/sec
Y 9081.2552 km $\dot{Y}$ 7.8698695 km/sec
Z -4433.7351 km $\dot{Z}$ .26071376 km/sec

5.4 STANDARD DEVIATIONS:

				APRIORI	
σX 375.8 m	$\sigma\dot{x}$ .18 m/sec	σX / m	$\sigma\dot{x}$ / m/sec
σY 142.8 m	$\sigma\dot{y}$ .06 m/sec	σY / m	$\sigma\dot{y}$ / m/sec
σZ 802.8 m	$\sigma\dot{z}$ .16 m/sec	σZ / m	$\sigma\dot{z}$ / m/sec

5.5 APPROACH HYPERBOLA:

B 7717.1268 km
B·T 6888.1737 km
B·R 3479.5330 km
Rp 3848.3921 km
TCA 217:18:28:3.92 gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB 31.063277 km
σB·T 17.608525 km
σB·R 25.590369 km
σRp 13.252118 km
σTCA 8.8313401 sec

5.7 DATA ARC LENGTH: 6.1 hrs

S c S = 18.0

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
41	RU	00:51	04:54	236	3.67	26.9
	CC3	23:31	05:49	361	.0234	.00003
62	C3	04:49	05:53	50	.0387	-.242

5.9 RESIDUAL PLOTS: TAPE NO. 11237 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: EPOCH FORWARDED FROM ODPL 1304 TO BRING DATA NEAR TO EPOCH

214/0800

PREPARED BY: VAN ZANDT R. L.
OD ANALYST

5. GEMINI [illegible] REPORT (TRANSLUNAR)

TAPE NO. 11717

5.1 O. D. IDENTIFICATION NO. 13[illegible] * ITEM NO. _____

5.2 EPOCH: DAY 2[illegible], 23 : 3[illegible] : [illegible] (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X 7147.[illegible] km $\dot{X}$ -.[illegible] km/sec

Y [illegible] km $\dot{Y}$ [illegible] km/sec

Z -4433.[illegible] km $\dot{Z}$.[illegible] km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX 37.1 m $\sigma\dot{x}$ .0[illegible]1 m/sec σX _____ m $\sigma\dot{x}$ _____ m/sec

σY 15.5 m $\sigma\dot{y}$ .0[illegible] m/sec σY _____ m $\sigma\dot{y}$ _____ m/sec

σZ 14.5 m $\sigma\dot{z}$ .026 m/sec σZ _____ m $\sigma\dot{z}$ _____ m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B 7130.2[illegible] km σB [illegible] km

B·T 6[illegible] km $\sigma B \cdot T$ [illegible] km

B·R 3419.6011 km $\sigma B \cdot R$ [illegible] km

Rp 3[illegible] km σRp [illegible] km

TCA 21[illegible] gmt σTCA [illegible] sec

5.7 DATA ARC LENGTH: 26 1/2 hrs

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	[illegible]	214:[illegible]	13:[illegible]	[illegible]	[illegible]	12.1
	[illegible]	04:49	[illegible]	1	[illegible]	.0172
	[illegible]	[illegible]	13:[illegible]	[illegible]	[illegible]	.0042
41	[illegible]	214:[illegible]	213:[illegible]	[illegible]	8.[illegible]	-80.3
	[illegible]	214:06:[illegible]	214:22:[illegible]	[illegible]	.02	.02
	[illegible]	213:25:[illegible]	213:[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	214:[illegible]	214:22:[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-.001
	[illegible]	14:[illegible]	22:54	[illegible]	.316	-.2034

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: [illegible]

* NOTE: WRONG KE USED IN MAPPING TO CLOSEST APPROACH

PREPARED BY: [illegible] R W B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 12560

5.1 O. D. IDENTIFICATION NO. [illegible] ITEM NO. _____

5.2 EPOCH: DAY 215, 06 : 00 : 26.1 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X -120597.57 km $\dot{X}$ -.80764476 km/sec

Y 182381.82 km $\dot{Y}$ .73523733 km/sec

Z 71745.451 km $\dot{Z}$ .48644815 km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX 18183.3 m $\sigma\dot{x}$ 3.451 m/sec σX _____ m $\sigma\dot{x}$ _____ m/sec

σY 112530. m $\sigma\dot{y}$ .866 m/sec σY _____ m $\sigma\dot{y}$ _____ m/sec

σZ 266765. m $\sigma\dot{z}$ 7.27 m/sec σZ _____ m $\sigma\dot{z}$ _____ m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B 5729.0102 km σB 1513.5264 km

B·T 380.53042 km $\sigma B \cdot T$ 375.81792 km

B·R 5716.36 km $\sigma B \cdot R$ 14[illegible].1251 km

Rp 2425.9294 km σRp 1[illegible]2.2815 km

TCA 217: 1[illegible]934.319 gmt σTCA 8[illegible].29796 sec

5.7 DATA ARC LENGTH: 3.[illegible] hrs

SSD 6.6286

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	[illegible]	8/03-0[illegible]	8/03-0[illegible]	106	5.07	-.377
	C3	8/03-0[illegible]	8/03-0654	42	.0256	.0048
	CC3	8/03-0[illegible]	8/03-0[illegible]	113	.0142	.00003
41	C3	8/03-0[illegible]	[illegible]	19	.0136	.00[illegible]
	CC3	8/03-06[illegible]	[illegible]	[illegible]	.0313	.0002

5.9 RESIDUAL PLOTS: TAPE NO. 11[illegible] ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Not enough tracking data to get an accurate fix on the state vector. Solution 1 post midcourse O.D.

PREPARED BY: [illegible] (R) W B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 12575

5.1 O. D. IDENTIFICATION NO. 2104 ITEM NO. _____

5.2 EPOCH: DAY 67/08/03, 06 : 00 : 26.1 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	-120601.11	km	$\dot{X}$	-.80787138	km/sec
Y	182384.58	km	$\dot{Y}$	.73512004	km/sec
Z	71731.581	km	$\dot{Z}$	.48638566	km/sec

5.4 STANDARD DEVIATIONS:

					APRIORI				
σX	1193.9	m	σẋ	.0543	m/sec	σX	1299.4	m	σẋ 100.0 m/sec
σY	1199.8	m	σẏ	.0968	m/sec	σY	1884.0	m	σẏ 100.0 m/sec
σZ	2197.8	m	σż	.174	m/sec	σZ	2327.6	m	σż 100.0 m/sec

5.5 APPROACH HYPERBOLA:

B	5729.1158	km
B·T	354.36872	km
B·R	5718.1464	km
Rp	2425.5423	km
TCA	67/08/05/17:10:21.2	gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB	42.429927	km
σB·T	5.9687354	km
σB·R	42.408[illegible]1	km
σRp	30.130462	km
σTCA	7.5482198	sec

5.7 DATA ARC LENGTH: 3.3 hrs

SOS = 6.98

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	8/03-0709	8/03-0904	106	5.21	.151
	C3	8/03-0602	8/03-0654	42	.0275	.00831
	CC3	8/03-0706	8/03-0920	113	.0142	.00008
41	C3	8/03-0706	8/03-0726	19	.0136	-.0107
	CC3	8/03-0602	8/03-0658	53	.0327	-.00103

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Post mid-course OD solution type 2. Two way doppler data only used in fit. Apriori covariance matrix input from pre-mid-course OD solution 1099

PREPARED BY: E. Hamel (R W P)
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11930

5.1 O. D. IDENTIFICATION NO. 2106 ITEM NO. _____

5.2 EPOCH: DAY 67/08/03, 06 : 00 : 26.1 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	−120598.07	km	$\dot{X}$	−.80772168	km/sec
Y	182383.38	km	$\dot{Y}$	.73523252	km/sec
Z	71740.378	km	$\dot{Z}$	.48634182	km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX	4725.7	m	$\sigma\dot{x}$	.290	m/sec	σX		m	$\sigma\dot{x}$		m/sec
σY	4414.1	m	$\sigma\dot{y}$	.233	m/sec	σY		m	$\sigma\dot{y}$		m/sec
σZ	15234.5	m	$\sigma\dot{z}$	.382	m/sec	σZ		m	$\sigma\dot{z}$		m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B	5748.023	km	σB	94.264508	km
B·T	371.90421	km	σB·T	32.851589	km
B·R	5735.9801	km	σB·R	88.354798	km
Rp	2439.6398	km	σRp	63.379267	km
TCA	67/08/05 17:10:02.5	gmt	σTCA	59.643421	sec

5.7 DATA ARC LENGTH: 6.38 hrs SOS = 9.23

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	8/03-0709	8/03-1214	234	5.31	.111
	C3	8/03-0602	8/03-0654	42	.0257	.00328
	CC3	8/03-0706	8/03-1225	253	.0138	−.00002
41	C3	8/03-0706	8/03-0726	19	.0137	.00125
	CC3	8/03-0602	8/03-0658	53	.0313	.000106

5.9 RESIDUAL PLOTS: TAPE NO. 11963 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Post mid course type 1 solution, Epoch from OD 2102.

PREPARED BY: E. Hamilton (R) W B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11033

5.1 O. D. IDENTIFICATION NO. 2108 ITEM NO. _____

5.2 EPOCH: DAY 215, 06 : 00 : 26.1 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X -120601.0[illegible] km $\dot{X}$ -.8078702 km/sec

Y 182384.61 km $\dot{Y}$ .73512238 km/sec

Z 71731.534 km $\dot{Z}$ .48638189 km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX 1191.7 m $\sigma\dot{x}$ .04618 m/sec σX 1239.4565 m $\sigma\dot{x}$ 100. m/sec

σY 1174.9 m $\sigma\dot{y}$ .0637 m/sec σY 1884.0326 m $\sigma\dot{y}$ 100. m/sec

σZ 2170.3 m $\sigma\dot{z}$ .1119 m/sec σZ 2327.5[illegible] m $\sigma\dot{z}$ 100. m/sec

5.5 APPROACH HYPERBOLA:

B 5729.9691 km

B•T 354.56713 km

B•R 5718.9883 km

Rp 2426.3556 km

TCA 217:17:10:21.569 gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB 27.678180 km

σB•T 5.0326097 km

σB•R 27.217174 km

σRp 19.517479 km

σTCA 8.44[illegible]2712 sec

5.7 DATA ARC LENGTH: 4.4 hrs

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RO	8/03-0[illegible]	8/03-1214	234	5.21	.829
	C3	8/03-0602	8/03-0654	42	.0275	.008
	CC3	8/03-0[illegible]	8/03-1[illegible]	253	.0137	[illegible]
41	C3	8/03-[illegible]	8/03-0726	[illegible]	.0136	-.0106
	CC3	8/03-0602	8/03-0658	53	.0326	-.0008

5.9 RESIDUAL PLOTS: TAPE NO. 11949 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

PREPARED BY: [illegible] (R) W B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2126 TAPE NO. 11775
ITEM NO.

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.1 GMT SEQ. NO. 0024
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120600.44	KM	DX	-.80790133	KM/SEC
Y	182384.23	KM	DY	.73507368	KM/SEC
Z	71733.718	KM	DZ	.48644544	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	431.2 M	DX	.00530 M/S	X	.0000 M	DX	.0000 M/S
Y	252.2 M	DY	.00290 M/S	Y	.0000 M	DY	.0000 M/S
Z	455.5 M	DZ	.00508 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5711.82	KM
B.R	5700.99	KM
B.T	351.627	KM
RCA	2413.06	KM
TCA	217/171015.104	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	.934766	KM
B.R	.838497	KM
B.T	.413172	KM
RCA	.592218	KM
TCA	.859199	SEC

5.7 DATA ARC LENGTH' 35 HRS 57 MIN SOS= 51.977

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.4352	17.3767
62	C3	215/0615	215/1658	127	.0087	-.0014
62	CC3	215/0706	215/1458	370	.0034	-.0005
62	RU	216/0759	216/1448	284	6.4760	45.8169
62	C3	216/0600	216/1708	173	.0109	-.0264
62	CC3	216/0704	216/1458	437	.0085	-.0045
41	C3	215/0706	215/0726	19	.0068	-.0008
41	CC3	215/0612	215/0658	37	.0036	.0112
41	RU	216/0027	216/0602	214	5.8288	5.3832
41	C3	215/2201	216/0734	85	.0051	.0116
41	CC3	215/2306	216/0658	451	.0093	.0040
12	RU	215/1525	216/1800	457	8.2207	-44.4289
12	C3	215/1401	216/1456	134	.0054	.0096
12	CC3	215/1503	216/1808	593	.0051	-.0003

5.9 RESIDUAL PLOTS' TAPE NO. 12597 ITEM NO.

5.10REMARKS' SOLUTION TYPE 1
ENCOUNTER CONDITIONS AGREE WITH PREVIOUS ODS
VERY GOOD DATA FIT

TIME OF REPORT' PREPARED BY' HAMILTON (R)
DAY 216 , 19 HR , 09 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11472

5.1 O. D. IDENTIFICATION NO. 2210 ITEM NO. 110 B

5.2 EPOCH: DAY 215, 06 : 00 : 26.100 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	-120600.38 km	$\dot{X}$	-0.80785347 km/sec
Y	182383.75 km	$\dot{Y}$	0.73509582 km/sec
Z	71735.176 km	$\dot{Z}$	0.48646837 km/sec

5.4 STANDARD DEVIATIONS:

				APRIORI			
σX	559.13 m	$\sigma\dot{x}$	.0249 m/sec	σX	m	$\sigma\dot{x}$	m/sec
σY	709.00 m	$\sigma\dot{y}$	.0105 m/sec	σY	m	$\sigma\dot{y}$	m/sec
σZ	1357.56 m	$\sigma\dot{z}$	.0247 m/sec	σZ	m	$\sigma\dot{z}$	m/sec

5.5 APPROACH HYPERBOLA:

B	5710.2236	km
B.T	356.81072	km
B.R	5699.0656	km
Rp	2412.2581	km
TCA	2.7 / 17:0.04741	gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB	4.9716	km
σB.T	2.5630	km
σB.R	4.2607	km
σRp	2.9793	km
σTCA	5.1521	sec

5.7 DATA ARC LENGTH: 12 hrs

SOS = 7.655

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	25/[illegible]	215/145402	[illegible]	5.48	3.00
	C3	[illegible]	[illegible]	[illegible]	.0236	.00212
	CC3	[illegible]	145232	[illegible]	.00920	.000357
41	C3	[illegible]	215/[illegible]	[illegible]	.00859	-.00622
	CC3	[illegible]	[illegible]	[illegible]	.0219	-.00171
12	RU	15/[illegible]	215/175[illegible]	147	6.64	-7.33
	C3	[illegible]	145[illegible]	54	.00792	.0353
	CC3	[illegible]	175832	166	.00920	.00206

5.9 RESIDUAL PLOTS: TAPE NO. 11138 ITEM NO. 113

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: WEIGHTS – CC3 = .1, C3 = 1, RU = 200. (SOLUTION 1)
A REALLY GOOD O.D. SOLVE FOR STATE ONLY.
DUE TO INPUT ERROR OUTPUT IS LABELLED 2110.

PREPARED BY: [signature] R (W) B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

TAPE NO. 11471

5.1 O. D. IDENTIFICATION NO. 2212 ITEM NO. 109A

5.2 EPOCH: DAY 215, [illegible] : 00 : 26.100 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X	-120601.27	km	$\dot{X}$	-0.80789622	km/sec
Y	182384.35	km	$\dot{Y}$	0.73507813	km/sec
Z	71731.855	km	$\dot{Z}$	0.48644672	km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX	1163.17 m	σ$\dot{x}$	.02767 m/sec	σX	1299.41 m	σ$\dot{x}$	1000.	m/sec
σY	1074.67 m	σ$\dot{y}$	.01312 m/sec	σY	1884.03 m	σ$\dot{y}$	1000.	m/sec
σZ	1931.45 m	σ$\dot{z}$	.03470 m/sec	σZ	2327.59 m	σ$\dot{z}$	1000.	m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B	5712.8543	km	σB	7.4255	km
B.T	351.76859	km	σB.T	2.98369	km
B.R	5702.0149	km	σB.R	6.8000	km
Rp	2414.04[illegible]4	km	σRp	4.7933	km
TCA	217/17[illegible]	gmt	σTCA	6.2513	sec

5.7 DATA ARC LENGTH: 12 hrs 505 = 5 [illegible] 1

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	215/[illegible]	[illegible]	3[illegible]9	[illegible]	[illegible]
	C3	[illegible]	[illegible]	142	.0270	-.[illegible]37
	CC3	[illegible]	145[illegible]	343	.00724	-.[illegible]427
41	C3	[illegible]	[illegible]	11	.02[illegible]9	-.[illegible]
	CC3	[illegible]	[illegible]	[illegible]1	.0[illegible]	.0[illegible]451
12	RU	215/[illegible]	[illegible]	[illegible]7	6.10	-32.0
	C3	140132	[illegible]	54	.00[illegible]	.0255
	CC3	150[illegible]	[illegible]	166	.00804	.000331

5.9 RESIDUAL PLOTS: TAPE NO. [illegible] ITEM NO. 109

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: VERY GOOD O.D. SOLUTION [illegible] CC3 AND PRE M/C A PRIORI. DATA WEIGHTS: CC3 = .1, C3 = 1., RU = 2000. SOLVE FOR STATE AND STATION LOCATIONS. DUE TO INPUT ERROR, OUTPUT IS LABELLED 2112.

PREPARED BY: [illegible] R (W) B
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2214

TAPE NO. 11478
ITEM NO. 111B
SEQ. NO. 0018
COMPUTER B

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.100 GMT
HR MIN SEC

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120600.26	KM	DX	-.80785573	KM/SEC
Y	182383.92	KM	DY	.73509629	KM/SEC
Z	71734.938	KM	DZ	.48646430	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	538.9	M	DX	.02357 M/S	X	.0000	M	DX	.0000 M/S
Y	660.7	M	DY	.00982 M/S	Y	.0000	M	DY	.0000 M/S
Z	1236	M	DZ	.02270 M/S	Z	.0000	M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5711.36	KM
B.R	5700.22	KM
B.T	356.624	KM
RCA	2412.78	KM
TCA	217/171005.708	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	4.57668	KM
B.R	3.89308	KM
B.T	2.40624	KM
RCA	2.72045	KM
TCA	4.83815	SEC

5.7 DATA ARC LENGTH' 15 HRS 30 MIN SOS= 13.638

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.4719	3.6260
62	C3	215/0602	215/1658	142	.0213	.0024
62	CC3	215/0706	215/1458	393	.0060	.0001
41	C3	215/0706	215/0726	19	.0065	-.0062
41	CC3	215/0602	215/0658	51	.0309	-.0010
12	RU	215/1525	215/2134	226	5.6603	-6.3717
12	C3	215/1401	215/1456	54	.0045	.0356
12	CC3	215/1503	215/2133	371	.0139	.0016

5.9 RESIDUAL PLOTS' TAPE NO. 11691 ITEM NO. 111A

5.10 REMARKS' GOOD O.D. THE FIT INCLUDES THE RESOLVER. CONVERGED RAPIDLY, AND AGREES WELL WITH PREVIOUS ODS. TYPE 1 SOLUTION.

TIME OF REPORT'
DAY 215 , 22 HR , 41 MIN GMT

PREPARED BY' J W UNDERWOOD (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2216

TAPE NO. 11773
ITEM NO. 118A
SEQ. NO. 0016
COMPUTER B

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.100 GMT
HR MIN SEC

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120601.42	KM	DX	-.80789992	KM/SEC
Y	182384.13	KM	DY	.73507744	KM/SEC
Z	71732.119	KM	DZ	.48644193	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	1156 M	DX	.02562 M/S	X	.0000 M	DX	.0000 M/S
Y	1063 M	DY	.01293 M/S	Y	.0000 M	DY	.0000 M/S
Z	1919 M	DZ	.03223 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5713.57	KM
B.R	5702.76	KM
B.T	351.405	KM
RCA	2414.26	KM
TCA	217/171016.663	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	7.11909	KM
B.R	6.55872	KM
B.T	2.76851	KM
RCA	4.62993	KM
TCA	5.76733	SEC

5.7 DATA ARC LENGTH' 15 HRS 30 MIN SOS= 11.473

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.0251	34.3035
62	C3	215/0602	215/1658	142	.0244	-.0097
62	CC3	215/0706	215/1458	393	.0022	.0003
41	C3	215/0706	215/0726	19	.0067	-.0110
41	CC3	215/0602	215/0658	51	.0318	.0047
12	RU	215/1525	215/2134	226	5.8392	-32.9646
12	C3	215/1401	215/1456	54	.0047	.0236
12	CC3	215/1503	215/2133	371	.0133	-.0005

5.9 RESIDUAL PLOTS' TAPE NO. 11691 ITEM NO. 118

5.10 REMARKS' GOOD O.D. TYPE 2 SOLN. CONVERGED RAPIDLY, AND AGREED WELL WITH PREVIOUS ODS. RESOLVER CORRECTIONS WERE USED

TIME OF REPORT'
DAY 216 , 00 HR , 50 MIN GMT

PREPARED BY' J W UNDERWOOD (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2228 TAPE NO. 11468
ITEM NO.

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.100 GMT SEQ. NO. 0029
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120602.97	KM	DX	-.80790124	KM/SEC
Y	182383.18	KM	DY	.73507232	KM/SEC
Z	71731.819	KM	DZ	.48644736	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	941.8 M	DX	.00636 M/S	X	.0000 M	DX	.0000 M/S
Y	892.3 M	DY	.00551 M/S	Y	.0000 M	DY	.0000 M/S
Z	1336 M	DZ	.00834 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5711.80	KM
B.R	5701.01	KM
B.T	350.956	KM
RCA	2413.08	KM
TCA	217/171017.121	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	2.69661	KM
B.R	2.61860	KM
B.T	.643929	KM
RCA	1.86822	KM
TCA	1.37706	SEC

5.7 DATA ARC LENGTH' 42 HRS 9 MIN SOS= 15.938

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.0231	52.1247
62	C3	215/0615	215/1658	127	.0050	.0110
62	CC3	215/0706	215/1458	370	.0042	.0021
62	RU	216/0759	216/1448	284	5.9194	37.2113
62	C3	216/0600	216/1708	173	.0141	-.0135
62	CC3	216/0704	216/1458	439	.0164	-.0014
41	C3	215/0706	215/0726	19	.0066	-.0104
41	CC3	215/0612	215/0658	37	.0041	.0028
41	RU	216/0027	216/0602	214	5.6500	43.9439
41	C3	215/2201	216/0734	85	.0142	.0175
41	CC3	215/2306	216/0658	451	.0044	.0014
41	RU	216/2310	217/0013	57	7.1455	42.3158
41	C3	216/2201	216/2257	53	.0055	.0085
41	CC3	216/2305	217/0012	56	.0043	.0091
12	RU	215/1525	215/2254	302	5.5948	-16.5364
12	C3	215/1401	216/1343	63	.0043	-.0062
12	CC3	215/1503	215/2258	414	.0018	.0007
12	RU	216/1524	216/2254	368	5.9526	-40.9565
12	C3	216/1344	216/2347	98	.0074	-.0031
12	CC3	216/1503	216/2257	431	.0041	-.0033

5.9 RESIDUAL PLOTS' TAPE NO. 12597 ITEM NO.

5.10REMARKS' GOOD O.D. TYPE 2 SOLN. CONVERGED RAPIDLY, AND AG
REED WELL WITH PREVIOUS ODS. RESOLVER CORRECTIONS WERE USED

TIME OF REPORT' PREPARED BY' J W UNDERWOOD (W)
DAY 217 , 02 HR , 04 MIN GMT O.D. ANALYST

5. ORBIT [illegible] (TRANSLUNAR)

TAPE NO. [illegible]

5.1 O. D. IDENTIFICATION NO. _____ ITEM NO. _____

5.2 EPOCH: DAY [illegible], [illegible] : [illegible] : [illegible] (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X [illegible] km $\dot{X}$ [illegible] km/sec

Y [illegible] km $\dot{Y}$ [illegible] km/sec

Z [illegible] km $\dot{Z}$ [illegible] km/sec

5.4 STANDARD DEVIATIONS: APRIORI

σX [illegible] m $\sigma \dot{x}$ [illegible] m/sec σX _____ m $\sigma \dot{x}$ _____ m/sec

σY [illegible] m $\sigma \dot{y}$ [illegible] m/sec σY _____ m $\sigma \dot{y}$ _____ m/sec

σZ [illegible] m $\sigma \dot{z}$ [illegible] m/sec σZ _____ m $\sigma \dot{z}$ _____ m/sec

5.5 APPROACH HYPERBOLA: 5.6 APPROACH HYPERBOLA STATISTICS

B [illegible] km σB [illegible] km

B·T [illegible] km $\sigma B \cdot T$ [illegible] km

B·R [illegible] km $\sigma B \cdot R$ [illegible] km

Rp [illegible] km σRp [illegible] km

TCA [illegible] gmt σTCA [illegible] sec

5.7 DATA ARC LENGTH: 22 [illegible] hrs

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
41	[illegible]	[illegible]	[illegible]	9	[illegible]	[illegible]
	C3	[illegible]	[illegible]	74	.008	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	.01	[illegible]
[illegible]	RU	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	C3	1401	[illegible]	62	.017	[illegible]
	[illegible]	1503	[illegible]	[illegible]	[illegible]	[illegible]

5.9 RESIDUAL PLOTS: TAPE NO. [illegible] 12003 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: [illegible]

PREPARED BY: [illegible] R W [illegible]
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2320

TAPE NO. 11623
ITEM NO. 122
SEQ. NO. 0020
COMPUTER B

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.100 GMT
HR MIN SEC

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120601.50	KM	DX	-.80789284	KM/SEC
Y	182383.93	KM	DY	.73507532	KM/SEC
Z	71732.518	KM	DZ	.48645730	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	1148	M	DX	.01991 M/S	X	.0000	M	DX	.0000 M/S
Y	986.1	M	DY	.01113 M/S	Y	.0000	M	DY	.0000 M/S
Z	1692	M	DZ	.01716 M/S	Z	.0000	M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5710.55	KM
B.R	5699.67	KM
B.T	352.201	KM
RCA	2412.11	KM
TCA	217/171013.374	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	4.37466	KM
B.R	3.81139	KM
B.T	2.14731	KM
RCA	2.69809	KM
TCA	4.41354	SEC

5.7 DATA ARC LENGTH' 22 HRS 18 MIN SOS= 1.5279

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.1293	38.8130
62	C3	215/0615	215/1658	127	.0124	-.0098
62	CC3	215/0706	215/1458	370	.0022	.0014
41	C3	215/0706	215/0726	19	.0068	-.0087
41	CC3	215/0612	215/0658	37	.0045	.0008
41	RU	216/0027	216/0301	153	5.2544	-14.4837
41	C3	215/2201	215/2257	55	.0047	.0371
41	CC3	215/2306	216/0421	306	.0042	.0002
12	RU	215/1525	215/2254	302	5.2269	-26.2649
12	C3	215/1401	215/2314	62	.0208	.0164
12	CC3	215/1503	215/2258	416	.0027	-.0013

5.9 RESIDUAL PLOTS' TAPE NO. 11721 ITEM NO. 65

5.10REMARKS' DID KEY 4 FOR TDA AT BEGINNING OF RUN
WORKED SECOND TIME WRONG TIME INPUT ON FIRST TRY
EXCELLENT CONVERGENCE IN THREE ITERATIONS
BLUNDER POINTS REMOVED VIA ODGX TYPE 2 SOLUTION
DOPPLER RESOLVER CORRECTION USED IN ODGX
SOME UNEXPLAINED 'WIGGLIES' PRESENT IN LATEST 41 DATA

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 216 , 06 HR , 26 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (TRANSMITTAL)

TAPE NO. 11473

5.1 O. D. IDENTIFICATION NO. 2322 ITEM NO. 130 G

5.2 EPOCH: DAY 215 , 06 : 00 : 26.1 (GMT)
hr min sec

5.3 STATE VECTOR (GEOC. 1950.0):

X = -120599.95 km $\dot{X}$ -.80791005 km/sec
Y 182384.62 km $\dot{Y}$ .73506568 km/sec
Z 71733.598 km $\dot{Z}$ .48644890 km/sec

5.4 STANDARD DEVIATIONS:

				APRIORI	
σX	458 m	$\sigma\dot{x}$	.008 m/sec	σX	/ m $\sigma\dot{x}$ / m/sec
σY	290 m	$\sigma\dot{y}$	.004 m/sec	σY	/ m $\sigma\dot{y}$ / m/sec
σZ	496 m	$\sigma\dot{z}$	.007 m/sec	σZ	/ m $\sigma\dot{z}$ / m/sec

5.5 APPROACH HYPERBOLA:

B	5710.3693	km
B·T	350.95027	km
B·R	5699.5748	km
Rp	2411.9941	km
TCA	217:17:10:15.6	gmt

5.6 APPROACH HYPERBOLA STATISTICS

σB	1.2636736	km
σB·T	.70246282	km
σB·R	1.0504366	km
σRp	.73991216	km
σTCA	1.4196454	sec

5.7 DATA ARC LENGTH: 27 hrs

5.8 DATA SUMMARY

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	RU	215:07:09	216:0859	425	5.3	20.
	C3	06:15	0653	181	.009	-.01
	CC3	0706	0920	491	.005	-.001
41	RU	216:0027	216:0602	214	5.7	5.8
	C3	215:0706	216:0734	104	.01	.039
	CC3	215:2306	216:0658	451	.008	-.0015
12	RU	215:1525	215:2254	302	5.8	-31.7
		1401	2314	62	.018	.0186
		1503	2258	414	.0049	-.0004

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: SOLUTION 1

PREPARED BY: VAN ZANDT R. W. (B)
OD ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2324

TAPE NO. 12599
ITEM NO. 131
SEQ. NO. 0021
COMPUTER B

5.2 EPOCH DAY 215 , 6 ' 0 ' 26.100 GMT
HR MIN SEC

5.3 STATE VECTOR (GEOCENTRIC 1950.0)

X	-120601.67	KM	DX	-.80788662	KM/SEC
Y	182383.72	KM	DY	.73507912	KM/SEC
Z	71732.791	KM	DZ	.48645750	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	1140	M	DX	.01477 M/S	X	.0000	M	DX	.0000 M/S
Y	947.6	M	DY	.00829 M/S	Y	.0000	M	DY	.0000 M/S
Z	1558	M	DZ	.01316 M/S	Z	.0000	M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5710.86	KM
B.R	5699.95	KM
B.T	352.817	KM
RCA	2412.36	KM
TCA	217/171012.492	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	3.44604	KM
B.R	3.04881	KM
B.T	1.60622	KM
RCA	2.15809	KM
TCA	3.49330	SEC

5.7 DATA ARC LENGTH' 27 HRS 17 MIN SOS= 1.9205

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	215/0709	215/1454	369	5.2677	27.8862
62	C3	215/0615	215/1658	127	.0115	-.0093
62	CC3	215/0706	215/1458	370	.0020	.0007
62	RU	216/0759	216/0859	56	4.7203	64.9286
62	C3	216/0600	216/0653	54	.0068	-.0301
62	CC3	216/0704	216/0920	120	.0052	-.0010
41	C3	215/0706	215/0726	19	.0067	-.0094
41	CC3	215/0612	215/0658	37	.0043	-.0006
41	RU	216/0027	216/0602	214	5.7732	3.0841
41	C3	215/2201	216/0734	85	.0053	.0392
41	CC3	215/2306	216/0658	451	.0044	.0000
12	RU	215/1525	215/2254	302	5.4650	-32.8146
12	C3	215/1401	215/2314	62	.0199	.0175
12	CC3	215/1503	215/2258	414	.0022	.0001

5.9 RESIDUAL PLOTS' TAPE NO. 11721 ITEM NO. NA

5.10REMARKS' THIS OD RUN IN MODE 4 SOLUTION TYPE 2
REDUCED REJECTION SIGMAS FOR CC3 TO .05 FOR ITERATION 3
DELQS LOOK GOOD SEEMINGLY A GOOD OD
ITERATION 3 REDUCED SOS TO ABOUT 2. CONTINUED WITH OUTPUT

TIME OF REPORT' PREPARED BY' CLARK/BUNCE (B)
DAY 216 , 11 HR , 03 MIN GMT O.D. ANALYST

5.0 TRANSLUNAR O.D. WHITE TEAM

5.1 O.D. IDENTIFICATION NO. 2230 TAPE NO. 11944
ITEM NO.

5.2 EPOCH DAY 217 , 2 ' 48 ' 38.420 GMT SEQ. NO. 0030
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (~~GEOCENTRIC~~ S.C. 1950.0)

X	-30286.070	KM	DX	.53214793	KM/SEC
Y	-38615.756	KM	DY	.71995959	KM/SEC
Z	-32387.231	KM	DZ	.48217820	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	7997 M	DX	.47641 M/S	X	10000 M	DX	1000 M/S
Y	7087 M	DY	1.2382 M/S	Y	10000 M	DY	1000 M/S
Z	9252 M	DZ	3.0301 M/S	Z	10000 M	DZ	1000 M/S

5.5 APPROACH HYPERBOLA'

B	5880.63	KM
B.R	5870.47	KM
B.T	345.448	KM
RCA	2532.08	KM
TCA	217/171126.531	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	201.049	KM
B.R	199.349	KM
B.T	26.0952	KM
RCA	141.308	KM
TCA	18.4870	SEC

5.7 DATA ARC LENGTH' 3 HRS 30 MIN SOS= .34901

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	RU	217/0249	217/0544	147	5.8064	.1633
41	CC3	217/0249	217/0541	164	.0034	-.0016

5.9 RESIDUAL PLOTS' TAPE NO. 12598 ITEM NO.

5.10REMARKS' GOOD O.D. THE FIT INCLUDES THE RESOLVER.
THERE IS ONLY 170 MIN OF DATA. 000000000000000000000000

TIME OF REPORT' PREPARED BY' J W UNDERWOOD (W)
DAY 217 , 06 HR , 35 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (PRE-INJECTION)

5.1 O.D. IDENTIFICATION NO. 2232

TAPE NO. 11947
ITEM NO.
SEQ. NO. 0030
COMPUTER B

5.2 EPOCH DAY 217 , 2 ' 48 ' 38.524 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-30287.041	KM	DX	.53220749	KM/SEC
Y	-38617.011	KM	DY	.71992437	KM/SEC
Z	-32386.418	KM	DZ	.48233939	KM/SEC

5.4 STANDARD DEVIATIONS

X	7816 M	DX	.37085 M/S	X	.0000 M	DX	.0000 M/S
Y	6565 M	DY	.86314 M/S	Y	.0000 M	DY	.0000 M/S
Z	8894 M	DZ	2.1734 M/S	Z	.0000 M	DZ	.0000 M/S

A PRIORI

5.5 APPROACH HYPERBOLA'

B	5869.80	KM
B.R	5859.52	KM
B.T	347.322	KM
RCA	2524.55	KM
TCA	217/171119.249	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	145.973	KM
B.R	144.692	KM
B.T	19.2982	KM
RCA	102.551	KM
TCA	15.5501	SEC

5.7 DATA ARC LENGTH' 5 HRS 0 MIN SOS= .70874

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	217/0630	217/0657	26	.0051	-.0798
41	RU	217/0249	217/0544	147	6.0343	.5170
41	CC3	217/0249	217/0658	225	.0046	.0001

5.9 RESIDUAL PLOTS' TAPE NO. 12598 ITEM NO.

5.10REMARKS' GOOD O.D. THE FIT INCLUDES THE RESOLVER.
THIS OD IS BASED ON VERY LITTLE DATA,SO COMPARISONS WITH OTH
ER ODS (IS NOT VERY MEANINGFUL. 000000000000000000

TIME OF REPORT'
DAY 217 , 07 HR , 51 MIN GMT

PREPARED BY' D.S.MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (PRE-INJECTION)

5.1 O.D. IDENTIFICATION NO. 2334 TAPE NO. 12549
ITEM NO.

5.2 EPOCH DAY 217 , 2 ' 48 ' 38.420 GMT SEQ. NO. 0031
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-30308.701	KM	DX	.53237858	KM/SEC
Y	-38629.149	KM	DY	.71890923	KM/SEC
Z	-32397.866	KM	DZ	.48455747	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	13423 M	DX	.18234 M/S	X	.0000 M	DX	.0000 M/S
Y	11627 M	DY	.76616 M/S	Y	.0000 M	DY	.0000 M/S
Z	1918 M	DZ	1.7270 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5722.05	KM
B.R	5711.29	KM
B.T	350.831	KM
RCA	2419.79	KM
TCA	217/171020.340	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	123.237	KM
B.R	123.068	KM
B.T	6.45701	KM
RCA	86.5632	KM
TCA	8.93100	SEC

5.7 DATA ARC LENGTH' 12 HRS 0 MIN SOS= 3.7297

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	217/0630	217/0713	42	.0078	-.0172
62	CC3	217/0724	217/0842	75	.0125	.0044
41	RU	217/0249	217/0544	147	6.3517	-.3810
41	C3	217/0725	217/0735	11	.0048	.0533
41	CC3	217/0249	217/0718	243	.0045	.0015

5.9 RESIDUAL PLOTS' TAPE NO. 11961 ITEM NO.

5.10REMARKS' GOOD OD NO A PRIORI COVIARIANCE MATRIX
C3 DATA INCLUDED IN FIT REJECTED ON FIRST ITERATION, BUT
INCLUDED IN SUCCEEDING ONES 4 ITERATIONS
TOTAL DELQS ABOUT 25. ON POSITION

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 217 , 09 HR , 32 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (PRE-INJECTION)
5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2336 TAPE NO. 11962
ITEM NO.
5.2 EPOCH DAY 217 , 2 ' 48 ' 38.420 GMT SEQ. NO. 0032
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-30318.291	KM	DX	.53246910	KM/SEC
Y	-38637.040	KM	DY	.71839200	KM/SEC
Z	-32398.236	KM	DZ	.48568980	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	9197 M	DX	.12446 M/S	X	.0000 M	DX	.0000 M/S
Y	7930 M	DY	.55305 M/S	Y	.0000 M	DY	.0000 M/S
Z	1695 M	DZ	1.2305 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5641.02	KM
B.R	5629.91	KM
B.T	353.866	KM
RCA	2362.77	KM
TCA	217/170945.011	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	87.5239	KM
B.R	87.4099	KM
B.T	4.46533	KM
RCA	61.0595	KM
TCA	5.86266	SEC

5.7 DATA ARC LENGTH' 8 HRS 0 MIN SOS= 5.0796

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	217/0953	217/1022	30	8.4159	20.8000
62	C3	217/0630	217/0713	42	.0099	-.0211
62	CC3	217/0724	217/1048	198	.0069	.0025
41	RU	217/0249	217/0544	147	6.7879	-3.7279
41	C3	217/0725	217/0735	11	.0050	.0413
41	CC3	217/0249	217/0718	243	.0070	.0004

5.9 RESIDUAL PLOTS' TAPE NO. 12553 ITEM NO. 169

5.10REMARKS' MAP TO DEBOOST FOR GUIDANCE NO A PRIORI
READ OLD CONDITIONS FROM DISK C3 REJECTION SIGMAS= 5.
SYSTEM NONSHARED-EPHEMERIS LOOKUP ERROR RESTART
UNCERTAIN CONVERGENCE 7 TOTAL ITERATIONS

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 217 , 12 HR , 12 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (TRANSLUNAR)

5.1 O.D. IDENTIFICATION NO. 2336 TAPE NO. 12582
ITEM NO.

5.2 EPOCH DAY 217 , 2 ' 48 ' 38.524 GMT SEQ. NO. 0033
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-30313.883	KM	DX	.53241820	KM/SEC
Y	-38633.393	KM	DY	.71867306	KM/SEC
Z	-32398.071	KM	DZ	.48507437	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	1411 M	DX	.03337 M/S	X	.0000 M	DX	.0000 M/S
Y	1606 M	DY	.13831 M/S	Y	.0000 M	DY	.0000 M/S
Z	1644 M	DZ	.23267 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 APPROACH HYPERBOLA'

B	5684.60	KM
B.R	5673.71	KM
B.T	351.764	KM
RCA	2393.39	KM
TCA	217/171004.854	GMT

5.6 APPROACH HYPERBOLA STATISTICS'

B	16.5114	KM
B.R	16.5062	KM
B.T	.417062	KM
RCA	11.5351	KM
TCA	2.27304	SEC

5.7 DATA ARC LENGTH' 10 HRS 0 MIN SOS= 6.9243

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	RU	217/0953	217/1248	102	6.4819	20.1569
62	C3	217/0630	217/0713	42	.0082	-.0252
62	CC3	217/0724	217/1248	287	.0062	.0010
41	RU	217/0249	217/0544	147	6.1483	-14.0122
41	C3	217/0725	217/0735	11	.0048	.0440
41	CC3	217/0249	217/0718	243	.0051	-.0017

5.9 RESIDUAL PLOTS' TAPE NO. 12584 ITEM NO.

5.10REMARKS' MAP TO DEBCOST FOR GUIDANCE NO A PRIORI
START WITH OD 2228 STATE C3 REJECTION SIGMAS= 3.
CONVERGENCE STILL UNCERTAIN TOTAL DELQS LESS THAN 30.
4 ITERATIONS GAVE UP

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 217 , 13 HR , 46 MIN GMT O.D. ANALYST

ORBIT DETERMINATION RESULTS – LUNAR ORBIT

Orbit Determination Solution Numbering

Each solution obtained by either the project or DSN Orbit Determination (OD) group is given an appropriate sequence number. This is a four-digit number where each digit has the following meaning:

OD Solution ABCD

A indicates the mission phase as follows:
0 - Training exercises with live spacecraft
1 - Postcislunar injection
2 - Postfirst midcourse
3 - Postsecond midcourse
4 - Postlunar injection (first ellipse)
5 - Post-transfer (second ellipse)
6 - Third ellipse or extended mission.

B indicates the OD team obtaining the solution as follows:

1 - Red team
2 - White team
3 - Blue team
0 - Green (extended mission) team

C and D is the solution number, where odd numbers are used by the DSN OD group and even numbers are used by the project OD group. The solution numbers are recycled after each change in mission phase.

As an example, OD number 4310 is the fifth project OD solution in first ellipse, and was completed by the blue team.

Orbit Determination Procedures

The orbit determination procedures followed in Lunar Orbiter Mission V were consistent throughout the lunar orbit phase of the mission. The orbit determinations were made using two-way doppler data (CC3) only; three-way doppler (C3) was deweighted and used as a check. No ranging data were available. The state vector and 10 low-order harmonics (C32, C33, C42, C43, C44, S32, S33, S42, S43, S44) were solved for. Except for the solved-for harmonics, the LRC 7/28B seventh-order harmonics were used for all OD work. (The reference shows the basis for choosing this particular set.)

Premission planning called for a data arc of two orbits of data in the first and second ellipses, with the epoch forwarded one orbit between solutions. During the mission, demand for "later and greater" orbit determinations was so high that additional solutions were made with less than two full orbits of data. The data arc for each solution is shown in the following table. In the final ellipse, a similar situation prevailed. The plan was to process four orbits of data, and forward the epoch two orbits. As the table shows, several more solutions were defined early in the phase. Also, the epoch was occasionally forwarded one or three orbits to better meet the mission control requirements.

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4102 ITEM NO. 12557

TAPE NO.

5.2 EPOCH: DAY 217, 16 : 57 : 15.562 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	469.07908	km	$\dot{X}$	.82415087	km/sec
Y	1462.9897	km	$\dot{Y}$	.68257009	km/sec
Z	-2313.6644	km	$\dot{Z}$	1.2941522	km/sec

5.4 STANDARD DEVIATIONS:

X	2861	m	$\dot{X}$	.970	m/s	A PRIORI X		m	$\dot{X}$ m/sec
Y	1675	m	$\dot{Y}$	1.322	m/s	Y		m	$\dot{Y}$ m/sec
Z	1672	m	$\dot{Z}$	1.120	m/s	Z		m	$\dot{Z}$ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	4865.6138	km	e	.60264205		ω	1.468495	deg.
Ω	117.76399	deg	i	85.033982	deg	Tp	-1721.4172	sec
r_p	1933.3903	km	h_p	195.35029	km	P	507.60128	min
r_a	7797.8371	km	h_a	6059.7471	km	Tan	281.06515	deg

5.6 LUNAR HARMONICS USED: 11/11 LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 0 hrs 30 min. SOS = 15.1

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	217/1657	217/1719	72	.0938	.00125
12	CC3	217/1657	217/1720	59	.0796	-.00026

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

TIME OF REPORT:
DAY 217, 18 hr 52 min GMT

Prepared by: [signature] (R M B)
O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4104

TAPE NO. 12552
ITEM NO. N.A.
SEQ. NO. 0036
COMPUTER B

5.2 EPOCH DAY 217 , 16 ' 57 ' 15.562 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	470.67484	KM	DX	.32332164	KM/SEC
Y	1463.7560	KM	DY	.68816731	KM/SEC
Z	-2312.5435	KM	DZ	1.3935717	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	222.8 M	DX	.07245 M/S	X	.0000 M	DX	.0000 M/S
Y	126.8 M	DY	.09964 M/S	Y	.0000 M	DY	.0000 M/S
Z	126.9 M	DZ	.06548 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4850.98	KM	ECC	.601475		APF	1.55904	DEG
LAN	117.770	DEG	INC	85.0079	DEG	TFP	-1723.08	SEC
RCA	1933.24	KM	PALT	195.146	KM	PER	505.313	MIN
APO	7768.72	KM	AALT	6030.63	KM	TA	281.010	DEG
LAT	283.509	DEG	LONG	96.4494	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

5.7 DATA ARC LENGTH' 3 HRS 30 MIN SOS= 699.38

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	217/1657	217/1859	135	.2251	.0226
12	CC3	217/1657	217/2020	209	.0922	.0033

5.9 RESIDUAL PLOTS' TAPE NO. 11958 ITEM NO. N.A.

5.10REMARKS' ONE BAD DATA POINT FROM STATION 62

TIME OF REPORT'
DAY 217 , 21 HR , 09 MIN GMT

PREPARED BY' HAMILTON (R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4106

TAPE NO. 12544
ITEM NO. N.A.
SEQ. NO. 0037
COMPUTER B

5.2 EPOCH DAY 217 , 16 ' 57 ' 15.562 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	470.16175	KM	DX	.32363191	KM/SEC
Y	1463.0316	KM	DY	.68840556	KM/SEC
Z	-2312.2232	KM	DZ	1.3936083	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	612.5 M	DX	.33554 M/S	X	222.1 M	DX	.0723 M/S
Y	561.1 M	DY	.24325 M/S	Y	126.2 M	DY	.0995 M/S
Z	625.2 M	DZ	.22813 M/S	Z	125.9 M	DZ	.0653 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4849.50	KM	ECC	.601476		APF	1.55258	DEG
LAN	117.766	DEG	INC	85.0137	DEG	TFP	-1722.43	SEC
RCA	1932.64	KM	PALT	194.550	KM	PER	505.082	MIN
APO	7766.36	KM	AALT	6028.27	KM	TA	281.005	DEG
LAT	283.497	DEG	LONG	96.4502	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
32	-.18157041E-03	C33	+.72044034E-04	C41	-.32631249E-05
42	+.37353330E-04	C43	-.95900773E-05	C44	-.17931712E-04
21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
32	-.24754436E-04	S33	-.17103322E-03	S41	+.67981786E-05
42	+.46913360E-05	S43	+.22996991E-04	S44	-.17726198E-04

5.7 DATA ARC LENGTH' 5 HRS 30 MIN SOS= 97.822

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	217/1657	217/1859	83	.0638	.0453
12	CC3	217/1657	217/2225	292	.0398	.0178

5.9 RESIDUAL PLOTS' TAPE NO. 12605 ITEM NO. N.A.

5.10REMARKS'

TIME OF REPORT'
DAY 217 , 23 HR , 29 MIN GMT

PREPARED BY' HAMILTON (R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4208 TAPE NO. 11924

5.2 EPOCH DAY 217 , 22 ' 19 ' 59.000 GMT SEQ. NO. 0039

HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2473.0176	KM	DX	.12216581	KM/SEC
Y	-5981.1115	KM	DY	.35376675	KM/SEC
Z	-4015.9605	KM	DZ	-.36975617	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	1179	M	DX	.20062	M/S	X	.0000	M	DX .0000 M/S
Y	2389	M	DY	.15639	M/S	Y	.0000	M	DY .0000 M/S
Z	2608	M	DZ	.12607	M/S	Z	.0000	M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4851.67	KM	ECC	.601212		APF	1.53390	DEG
LAN	114.832	DEG	INC	84.9299	DEG	TFP	-12676.1	SEC
RCA	1934.79	KM	PALT	196.702	KM	PER	505.422	MIN
APO	7768.56	KM	AALT	6030.47	KM	TA	189.322	DEG
LAT	349.187	DEG	LONG	295.803	DEG			

5.6 LUNAR HARMONICS USED' LRC7/28B MODIFIED

ITERATION NUMBER 5

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.33482584E-04	C33	-.51366448E-04	C41	-.32631249E-05
C42	-.52094023E-05	C43	+.30127782E-05	C44	+.78837173E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.10280415E-04	S33	+.99920373E-04	S41	+.67981786E-05
S42	-.50271153E-05	S43	-.25087322E-05	S44	+.92987707E-05

5.7 DATA ARC LENGTH' 6 HRS 40 MIN SOS= 6.8670

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	C3	217/2312	217/2327	16	.0096	-.0213
41	CC3	217/2336	218/0403	223	.0148	.0007
12	C3	217/2336	218/0059	84	.0708	-.0039
12	CC3	217/2220	217/2328	68	.0163	.0002

5.9 RESIDUAL PLOTS' TAPE NO. 11919 ITEM NO. N.A.

5.10 REMARKS' GOOD O.D.,DATA SOMEWHAT NOISY.
ITERATION 5 USED A DATA FILE FROM THE PRIME STRING.
ITERATION 3,COVERED IN AN EARLIER REPORT,USED DATA FROM THE BACK-UP STRING,WHICH WAS MUCH NOISIER.

TIME OF REPORT' PREPARED BY' MCKELLAR (W)
DAY 218 , 06 HR , 38 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4210

TAPE NO. 11937
ITEM NO. N.A.
SEQ. NO. 0039
COMPUTER B

5.2 EPOCH DAY 217 , 22 ' 19 ' 59.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2472.8088	KM	DX	.12219449	KM/SEC
Y	-5980.7834	KM	DY	.35379849	KM/SEC
Z	-4016.0266	KM	DZ	-.36976188	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	645.0	M	DX	.17311	M/S	X	1179	M	DX .2006 M/S
Y	2143	M	DY	.10271	M/S	Y	2389	M	DY .1564 M/S
Z	2475	M	DZ	.11865	M/S	Z	2608	M	DZ .1261 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4851.60	KM	ECC	.601183		APF	1.53397	DEG
LAN	114.832	DEG	INC	84.9280	DEG	TFP	-12675.5	SEC
RCA	1934.90	KM	PALT	196.812	KM	PER	505.410	MIN
APO	7768.30	KM	AALT	6030.21	KM	TA	189.323	DEG
LAT	349.186	DEG	LONG	295.804	DEG			

5.6 LUNAR HARMONICS USED' LRC7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.67163511E-05	C33	-.27018737E-04	C41	-.32631249E-05
C42	+.65789531E-05	C43	+.27735275E-05	C44	+.14194100E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.11854930E-04	S33	+.32712641E-04	S41	+.67981786E-05
S42	-.41219115E-05	S43	+.48306174E-06	S44	+.39644735E-05

5.7 DATA ARC LENGTH' 9 HRS 10 MIN SOS= 10.304

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	218/0600	218/0653	54	.0134	.0000
41	C3	217/2312	217/2327	16	.0098	-.0117
41	CC3	217/2336	218/0654	389	.0148	-.0000
12	C3	217/2336	218/0059	84	.0688	-.0021
12	CC3	217/2220	217/2328	68	.0163	-.0004

5.9 RESIDUAL PLOTS' TAPE NO. 11956 ITEM NO. N.A.

5.10REMARKS' THIS IS A GOOD O.D. THE SOS IS LOW,AND THERE IS NOT MUCH NOISE IN THE DATA.

TIME OF REPORT'
DAY 218 , 08 HR , 11 MIN GMT

PREPARED BY' MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4312

TAPE NO. 11937
ITEM NO. N.A.
SEQ. NO. 0041
COMPUTER B

.2 EPOCH DAY 217 , 22 ' 19 ' 59.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2472.7438	KM	DX	.12220324	KM/SEC
Y	-5980.7034	KM	DY	.35380240	KM/SEC
Z	-4016.1921	KM	DZ	-.36975526	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	176.1 M	DX	.09406 M/S	X	.0000 M	DX	.0000 M/S
Y	838.7 M	DY	.05040 M/S	Y	.0000 M	DY	.0000 M/S
Z	1370 M	DZ	.07207 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4851.60	KM	ECC	.601181		APF	1.53562	DEG
LAN	114.832	DEG	INC	84.9271	DEG	TFP	-12675.6	SEC
RCA	1934.91	KM	PALT	196.822	KM	PER	505.411	MIN
APO	7768.30	KM	AALT	6030.21	KM	TA	189.323	DEG
LAT	349.184	DEG	LONG	295.804	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.11071855E-04	C33	-.25537687E-04	C41	-.32631249E-05
C42	+.37179568E-05	C43	+.62057439E-06	C44	+.13261580E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.27489861E-05	S33	+.28904137E-04	S41	+.67981786E-05
S42	-.30334304E-05	S43	-.43118580E-06	S44	+.34203459E-05

5.7 DATA ARC LENGTH' 11 HRS 10 MIN SOS= 4.7924

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	218/0600	218/0653	54	.0048	.0036
62	CC3	218/0704	218/0929	141	.0141	-.0004
41	C3	217/2312	218/0728	40	.0125	-.0020
41	CC3	217/2336	218/0654	389	.0074	-.0000
12	C3	217/2336	218/0059	80	.0068	-.0030
12	CC3	217/2220	217/2328	68	.0025	.0006

5.9 RESIDUAL PLOTS' TAPE NO. 12620 ITEM NO. N.A.

5.10REMARKS' A VERY WELL EXECUTED O.D. DONE BY GARY CLARK

TIME OF REPORT'
DAY 218 , 10 HR , 47 MIN GMT

PREPARED BY' CLARK (B)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4314 TAPE NO. 11468
ITEM NO.

5.2 EPOCH DAY 217 , 22 ' 20 ' 0.000 GMT SEQ. NO. 0044
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2472.3634	KM	DX	.12227144	KM/SEC
Y	-5979.8895	KM	DY	.35384523	KM/SEC
Z	-4017.0793	KM	DZ	-.36970760	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	34.86 M	DX	.02754 M/S	X	.0000 M	DX	.0000 M/S
Y	261.8 M	DY	.01594 M/S	Y	.0000 M	DY	.0000 M/S
Z	378.0 M	DZ	.01931 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4851.42	KM	ECC	.601178		APF	1.54504	DEG
LAN	114.832	DEG	INC	84.9218	DEG	TFP	-12675.0	SEC
RCA	1934.86	KM	PALT	196.765	KM	PER	505.382	MIN
APO	7767.99	KM	AALT	6029.90	KM	TA	189.323	DEG
LAT	349.175	DEG	LONG	295.806	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.36207980E-05	C33	+.23480721E-04	C41	-.32631249E-05
C42	+.40796846E-05	C43	-.51149275E-05	C44	-.43856142E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.24258408E-04	S33	-.46318172E-04	S41	+.67981786E-05
S42	+.15976275E-05	S43	-.10365186E-05	S44	-.59367917E-05

5.7 DATA ARC LENGTH' 15 HRS 14 MIN SOS= 133.81

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	218/0600	218/0653	54	.0057	.0052
62	CC3	218/0704	218/1333	376	.0490	.0083
41	C3	217/2312	218/0728	40	.0116	.0179
41	CC3	217/2336	218/0654	389	.0291	.0126
12	C3	217/2336	218/0059	80	.0222	.0059
12	CC3	217/2220	217/2328	68	.0126	-.0232

5.9 RESIDUAL PLOTS' TAPE NO. 12631 ITEM NO.

5.10REMARKS' GOOD OD
WILL MAP TO THREE TIMES USING PAREN 08-EDELT

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 218 , 15 HR , 04 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4116 TAPE NO. 11474
ITEM NO. N.A.

5.2 EPOCH DAY 218 , 6 ' 49 ' 0.000 GMT SEQ. NO. 0046
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2443.1284	KM	DX	.12946827	KM/SEC
Y	-5899.1670	KM	DY	.36843493	KM/SEC
Z	-4093.8285	KM	DZ	-.35998776	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	277.6 M	DX	.05007 M/S	X	.0000 M	DX	.0000 M/S
Y	719.2 M	DY	.04027 M/S	Y	.0000 M	DY	.0000 M/S
Z	1008 M	DZ	.05619 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4850.92	KM	ECC	.600847		APF	1.49307	DEG
LAN	110.157	DEG	INC	84.7977	DEG	TFP	-12445.1	SEC
RCA	1936.26	KM	PALT	198.168	KM	PER	505.304	MIN
APO	7765.59	KM	AALT	6027.50	KM	TA	190.211	DEG
LAT	348.345	DEG	LONG	291.233	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIE

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.66468683E-04	C33	+.80164180E-04	C41	-.32631249E-05
C42	+.24792218E-04	C43	-.44252877E-05	C44	-.17390645E-04
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.14675890E-04	S33	-.17753858E-03	S41	+.67981786E-05

5.7 DATA ARC LENGTH' 8 HRS 29 MIN SOS= 74.522

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	218/0649	218/0653	5	.0040	-.0050
62	CC3	218/0704	218/1517	475	.0399	-.0005
41	C3	218/0705	218/0728	24	.0045	-.0010
41	CC3	218/0649	218/0654	6	.0009	-.0037
12	C3	218/1502	218/1517	16	.0050	.0006

5.9 RESIDUAL PLOTS' TAPE NO. 12632 ITEM NO. N.A.

5.10REMARKS' ONE ORBIT OF DATA.
VERY GOOD DATA FIT.

TIME OF REPORT' PREPARED BY' LAURENCE NIELSON(R)
DAY 218 , 21 HR , 02 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4118

TAPE NO. 11474
ITEM NO. N.A.
SEQ. NO. 0046
COMPUTER B

5.2 EPOCH DAY 218 , 6 ' 49 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2443.4669	KM	DX	.12953551	KM/SEC
Y	-5898.6063	KM	DY	.36843019	KM/SEC
Z	-4096.1121	KM	DZ	-.35984336	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	42.15	M	DX	.02611 M/S	X	.0000	M	DX	.0000 M/S
Y	291.5	M	DY	.01812 M/S	Y	.0000	M	DY	.0000 M/S
Z	425.4	M	DZ	.02308 M/S	Z	.0000	M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4851.23	KM	ECC	.600909		APF	1.51500	DEG
LAN	110.152	DEG	INC	84.7928	DEG	TFP	-12447.3	SEC
RCA	1936.08	KM	PALT	197.992	KM	PER	505.352	MIN
APO	7766.38	KM	AALT	6028.29	KM	TA	190.206	DEG
LAT	348.328	DEG	LONG	291.231	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.66468683E-04	C33	+.80164180E-04	C41	-.32631249E-05
C42	+.24792218E-04	C43	-.44252877E-05	C44	-.17390645E-04
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.14675890E-04	S33	-.17753858E-03	S41	+.67981786E-05
S42	+.46597610E-05	S43	+.50445286E-05	S44	-.16436425E-04

5.7 DATA ARC LENGTH: 16 HRS 58 MIN SOS= 292.32

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	218/0649	218/1758	125	.0462	.0156
62	CC3	218/0704	218/1529	487	.0510	.0221
41	C3	218/0705	218/0728	24	.0152	-.0219
41	CC3	218/0649	218/0654	6	.0106	-.1112
12	C3	218/1502	218/1525	24	.0130	.0656
12	CC3	218/1554	218/2215	376	.0600	.0093

5.9 RESIDUAL PLOTS: TAPE NO. 12632 ITEM NO. N.A.

5.10 REMARKS: TWO ONE ORBITS OF DATA.
VERY GOOD DATA FIT.

TIME OF REPORT:
DAY 218 , 23 HR , 45 MIN GMT

PREPARED BY: LAURENCE NIELSON(R)
O.D. ANALYST

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4192 ITEM NO. 729D

TAPE NO. 12616

5.2 EPOCH: DAY 67/086,6 16 : 50 : 0.0 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-1231.5347	km	$\dot{X}$	0.29304045	km/sec
Y	-2694.3063	km	$\dot{Y}$	0.74[illegible]	km/sec
Z	-5124.4486	km	$\dot{Z}$	0.06974438	km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

σX	135.2	m	$\dot{X}$	.014	m/s	X		m	$\dot{X}$		m/sec
σY	309.3	m	$\dot{Y}$	.007	m/s	Y		m	$\dot{Y}$		m/sec
σZ	194.1	m	$\dot{Z}$	.048	m/s	Z		m	$\dot{Z}$		m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	4851.6373	km	e	0.600678		ω	1.472	deg.
Ω	38.280	deg	i	84.649	deg	Tp	-6693.46	sec
r_p	1937.268	km	h_p	179.18	km	P	505.416	min
r_a	7766.007	km	h_a	6027.92	km	Tan	-142.43	deg

5.6 LUNAR HARMONICS USED: LPC 77SB NOD. LAT: -38.842 LONG: 288.939

5.7 DATA ARC LENGTH: 14 hrs 0.0 min. SOS = 256.5

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	8/06-1650	8/06-1750	[illegible]	.048	.038
41	C3	8/06-2252	8/06-2[illegible]	31	.006	.027
	CC3	8/06-2339	8/06-[illegible]	[illegible]	.063	.016
12	C3	8/06-2339	8/06-[illegible]	72	.043	.077
	CC3	8/06-1650	8/06-2325	373	.049	.0074

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

TIME OF REPORT: Prepared by: _____ R W B

DAY , hr min GMT O.D. Analyst

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 4220 ITEM NO. 11476

TAPE NO. 22[illegible] (GMT)

5.2 EPOCH: DAY 21[illegible], 06 : 49 : 0
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	−2442.[illegible]7 km	$\dot{X}$	.13036 km/sec
Y	−[illegible].63 km	$\dot{Y}$	.[illegible] km/sec
Z	−4110.16 km	$\dot{Z}$	−.3[illegible]05 km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	40 m	$\dot{X}$	.017 m/s	X	/ m	$\dot{X}$	/ m/sec
Y	175 m	$\dot{Y}$	.012 m/s	Y	/ m	$\dot{Y}$	/ m/sec
Z	271 m	$\dot{Z}$	.014 m/s	Z	/ m	$\dot{Z}$	/ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	km	e		ω	deg.
Ω	deg	i	deg	Tp	sec
r_p	km	h_p	km	P	min
r_a	km	h_a	km	Tan	deg

5.6 LUNAR HARMONICS USED: _____ LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 2[illegible] hrs min. SOS = 34[illegible]

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	03			1[illegible]	.159	.019
[illegible]	003			444	.113	−.017
41	03			[illegible]	[illegible]	[illegible]
	003			[illegible]	.097	.1[illegible]

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: last OD in initial ellipse. It was not felt to be [illegible], so it was that [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

TIME OF REPORT: Prepared by: [illegible] R W B

DAY , hr min GMT O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5302

TAPE NO. 11476
ITEM NO.
SEQ. NO. 0056
COMPUTER B

5.2 EPOCH DAY 219 , 8 ' 43 ' 59.650 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2062.1384	KM	DX	.19746156	KM/SEC
Y	-4864.5639	KM	DY	.52708784	KM/SEC
Z	-4762.7087	KM	DZ	-.21830834	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	7981	M	DX	.15018	M/S	X	.0000	M	DX 937.4 M/S
Y	20338	M	DY	3.2334	M/S	Y	.0000	M	DY 13358 M/S
Z	36778	M	DZ	4.9802	M/S	Z	.0000	M	DZ 19121 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4835.16	KM	ECC	.615943		APF	.903203	DEG
LAN	95.9154	DEG	INC	84.6613	DEG	TFP	-9820.00	SEC
RCA	1856.97	KM	PALT	116.884	KM	PER	502.843	MIN
APO	7813.34	KM	AALT	6075.25	KM	TA	200.175	DEG
LAT	339.017	DEG	LONG	277.969	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17362000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.74045999E-05	C33	+.37547999E-05	C41	-.32630999E-05
C42	+.91579998E-07	C43	-.41069999E-06	C44	-.47307000E-07
S21	-.55149999E-05	S22	-.16573000E-05	S31	-.13551000E-04
S32	+.20902000E-05	S33	+.35233000E-06	S41	+.67981999E-05
S42	-.78789999E-06	S43	-.93785999E-06	S44	+.15804000E-07

5.7 DATA ARC LENGTH' 1 HRS. 20 MIN SOS= 1.1959

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/0846	219/0919	11	.0391	-.0033
62	CC3	219/0923	219/1002	40	.0060	-.0000
41	C3	219/0925	219/0928	4	.0124	-.2039
41	CC3	219/0846	219/0918	15	.0319	.0008

5.9 RESIDUAL PLOTS' TAPE NO. 12556 ITEM NO.

5.10REMARKS' GOOD PRELIMINARY OD FOUND IT NECESSARY TO INPUT AN A PRIORI COVARIANCE MATRIX AND SOLVE ONLY FOR STATE AND DOPPLER BIAS IN ORDER TO CONVERGE

TIME OF REPORT'
DAY 219 , 10 HR , 36 MIN GMT

PREPARED BY' BUNCE (B)
O.D. ANALYST

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5304 ITEM NO. 231D

TAPE NO. 11945

5.2 EPOCH: DAY 219, 08 : 43 : 59.65 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-2057.5673 km	$\dot{X}$	.19734203 km/sec
Y	-4849.1891 km	$\dot{Y}$	.52508926 km/sec
Z	-4782.0810 km	$\dot{Z}$	-.21564265 km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	152 m	$\dot{X}$	.033 m/s	X	/ m	$\dot{X}$	/ m/sec
Y	854 m	$\dot{Y}$	.019 m/s	Y	/ m	$\dot{Y}$	/ m/sec
Z	828 m	$\dot{Z}$	.032 m/s	Z	m	$\dot{Z}$	m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	4820.5151 km	e	.61856943	ω	1.3996254 deg.
Ω	95.890810 deg	i	84.[illegible]3573 deg	Tp	-9815.3922 sec
r_p	1838.6918 km	h_p	100.6[illegible]182 km	P	500.56034 min
r_a	7802.3382 km	h_a	6064.2482 km	Tan	199.[illegible] deg

5.6 LUNAR HARMONICS USED: 7/[illegible] LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 3 hrs 0 min. SOS = 367

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	219:[illegible]	[illegible]	11	[illegible]	-.[illegible]
[illegible]	CC3	[illegible]	1141	120	.175	-.0008
41	C3	0925	0928	4	.00[illegible]	-.103
	CC3	0846	0918	15	[illegible]	.0055

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Did not estimate harmonics

TIME OF REPORT:
DAY , hr min GMT

Prepared by: [signature] R W B
O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5306 TAPE NO. 12526
ITEM NO.

5.2 EPOCH DAY 219 , 8 ' 43 ' 59.650 GMT SEQ. NO. 0058
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2059.0090	KM	DX	.19737946	KM/SEC
Y	-4850.6605	KM	DY	.52490379	KM/SEC
Z	-4783.9072	KM	DZ	-.21523647	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	1130 M	DX	.07173 M/S	X	10000 M	DX	100.00 M/S
Y	3893 M	DY	.38223 M/S	Y	10000 M	DY	100.00 M/S
Z	6053 M	DZ	.60623 M/S	Z	10000 M	DZ	100.00 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.26	KM	ECC	.619031		APF	1.41325	DEG
LAN	95.8828	DEG	INC	84.6097	DEG	TFP	-9815.66	SEC
RCA	1836.75	KM	PALT	98.6604	KM	PER	500.676	MIN
APO	7805.77	KM	AALT	6067.68	KM	TA	199.872	DEG
LAT	338.814	DEG	LONG	277.979	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	-.21175797E-03	C33	+.14848337E-03	C41	-.32630999E-05
C42	-.17896052E-04	C43	+.17945171E-04	C44	+.48747844E-04
S21	-.55149999E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.86475117E-04	S33	+.43577183E-03	S41	+.67981999E-05
S42	+.31994804E-05	S43	-.64232448E-05	S44	-.14613434E-04

5.7 DATA ARC LENGTH' 5 HRS 15 MIN SOS= 26.530

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/0848	219/0858	9	.0188	-.0007
62	CC3	219/0923	219/1358	260	.0320	.0000
41	C3	219/0925	219/0928	4	.0083	-.0309
41	CC3	219/0848	219/0918	13	.0175	.0068

5.9 RESIDUAL PLOTS' TAPE NO. 12503 ITEM NO.

5.10REMARKS' INPUT COVARIANCE MATRIX MODIFY HARMONICS
NEGLECTED TO INPUT CONVERGED STATE FROM OD 5304
CONVERGED IN 6 ITERATIONS USING PRDL POST- BURN CONDITIONS
SEEMS TO BE A GOOD OD

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 219 , 14 HR , 56 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5308

TAPE NO. 12527
ITEM NO.
SEQ. NO. 0060
COMPUTER B

5.2 EPOCH DAY 219 , 8 ' 43 ' 59.650 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2057.8199	KM	DX	.19742487	KM/SEC
Y	-4850.5402	KM	DY	.52512871	KM/SEC
Z	-4784.2900	KM	DZ	-.21544570	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	605.2 M	DX	.05998 M/S	X	.0000 M	DX	.0000 M/S
Y	2340 M	DY	.18076 M/S	Y	.0000 M	DY	.0000 M/S
Z	3244 M	DZ	.30019 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4822.73	KM	ECC	.618592		APF	1.39198	DEG
LAN	95.8906	DEG	INC	84.6058	DEG	TFP	-9818.81	SEC
RCA	1839.43	KM	PALT	101.338	KM	PER	500.906	MIN
APO	7806.04	KM	AALT	6067.95	KM	TA	199.897	DEG
LAT	338.810	DEG	LONG	277.988	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.80087578E-04	C33	-.35500061E-04	C41	-.32630999E-05
C42	+.67885678E-05	C43	+.11422887E-05	C44	+.22113338E-04
S21	-.55149999E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.38597907E-05	S33	+.18768520E-03	S41	+.67981999E-05
S42	-.58157150E-05	S43	-.95297970E-05	S44	+.48504108E-05

5.7 DATA ARC LENGTH: 7 HRS 0 MIN SOS= 34.352

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/0848	219/0858	9	.0211	-.0008
62	CC3	219/0923	219/1541	344	.0317	-.0015
41	C3	219/0925	219/0928	4	.0123	-.0280
41	CC3	219/0848	219/0918	13	.0148	.0012
12	C3	219/1534	219/1540	7	.0135	-.0019

5.9 RESIDUAL PLOTS: TAPE NO. 12626 ITEM NO.

5.10REMARKS: OD 5306 USED NO DOPPLER RESOLVER CORRECTIONS
START SAVED WITH GET ITNO OOPS NO PS1X ON ODGX ABORT
RESTART GET ITNO 6 INPUT COVARIANCE MATRIX
GOOD DATA FIT

TIME OF REPORT:
DAY 219 , 17 HR , 07 MIN GMT

PREPARED BY: CLARK (B)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5110 TAPE NO. 12525
ITEM NO.

5.2 EPOCH DAY 219 , 8 ' 43 ' 59.650 GMT SEQ. NO. 0061
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2057.3183	KM	DX	.19747282	KM/SEC
Y	-4848.6461	KM	DY	.52516071	KM/SEC
Z	-4785.3358	KM	DZ	-.21534479	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	273.5 M	DX .03657 M/S	X	.0000 M	DX .0000 M/S
Y	870.6 M	DY .05471 M/S	Y	.0000 M	DY .0000 M/S
Z	935.9 M	DZ .08571 M/S	Z	.0000 M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4822.10	KM	ECC	.618562		APF	1.41281	DEG
LAN	95.8883	DEG	INC	84.6041	DEG	TFP	-9818.10	SEC
RCA	1839.33	KM	PALT	101.242	KM	PER	500.807	MIN
APO	7804.87	KM	AALT	6066.78	KM	TA	199.893	DEG
LAT	338.793	DEG	LONG	277.989	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.53908980E-04	C33	-.27524584E-04	C41	-.32630999E-05
C42	+.18996195E-04	C43	+.12437499E-05	C44	+.14113271E-04
S21	-.55149999E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.43099346E-05	S33	+.11475368E-03	S41	+.67981999E-05
S42	-.62327054E-05	S43	-.79734283E-05	S44	+.34848361E-05

5.7 DATA ARC LENGTH' 11 HRS 0 MIN SOS= 46.053

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/0848	219/1819	54	.0156	.0059
62	CC3	219/0923	219/1728	374	.0350	-.0001
41	C3	219/0925	219/0928	4	.0089	-.0070
41	CC3	219/0848	219/0918	13	.0187	-.0155
12	C3	219/1534	219/1727	30	.0093	-.0014
12	CC3	219/1735	219/1819	45	.0097	.0045

5.9 RESIDUAL PLOTS' TAPE NO. 12530 ITEM NO.

5.10REMARKS' STARTED WITH GET ITNO 3. READOUT FROM 1558 TO 1717 CAUSED TEMPORARY PROBLEMS. THIS DATA WAS TAKEN OUT AND THE FITTING WAS CONTINUED. RESULTANT FINAL FIT IS EXCELLENT

TIME OF REPORT' PREPARED BY' PAUL HUNTRESS (R)
DAY 219 , 21 HR , 33 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5214 TAPE NO. 11896
ITEM NO.

5.2 EPOCH DAY 219 , 8 ' 43 ' 59.650 GMT SEQ. NO. 0063
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2058.4227	KM	DX	.19720236	KM/SEC
Y	-4854.3997	KM	DY	.52496715	KM/SEC
Z	-4778.7186	KM	DZ	-.21592257	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	111.1 M	DX	.02572 M/S	X	.0000 M	DX	.0000 M/S
Y	566.2 M	DY	.02188 M/S	Y	.0000 M	DY	.0000 M/S
Z	569.1 M	DZ	.05416 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.65	KM	ECC	.618711		APF	1.34533	DEG
LAN	95.8997	DEG	INC	84.6146	DEG	TFP	-9816.14	SEC
RCA	1838.44	KM	PALT	100.351	KM	PER	500.737	MIN
APO	7804.86	KM	AALT	6066.77	KM	TA	199.889	DEG
LAT	338.864	DEG	LONG	277.988	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.18398709E-04	C33	+.37023450E-04	C41	-.32630998E-05
C42	+.16267877E-04	C43	-.58133253E-05	C44	-.53217673E-06
S21	-.55149998E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.46144084E-04	S33	-.15638808E-04	S41	+.67981998E-05
S42	+.10816588E-05	S43	-.16787039E-05	S44	-.46765496E-05

5.7 DATA ARC LENGTH' 16 HRS 40 MIN SOS= 504.97

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/0848	219/1913	105	.1061	-.0381
62	CC3	219/0923	219/1728	369	.0805	-.0014
41	C3	219/0925	219/0928	4	.0118	-.0281
41	CC3	219/0848	219/0918	13	.0143	.1378
41	C3	219/2345	220/0106	80	.0332	-.0003
12	C3	219/1534	219/1727	25	.0208	-.1638
12	CC3	219/1735	220/0105	426	.0728	-.0327

5.9 RESIDUAL PLOTS' TAPE NO. 11898 ITEM NO.

5.10REMARKS' GOOD OD.

TIME OF REPORT' PREPARED BY' D.S. MCKELLAR (W)
DAY 220 , 02 HR , 32 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5216

TAPE NO. 11935
ITEM NO.
SEQ. NO. 0063
COMPUTER W

5.2 EPOCH DAY 219 , 14 ' 59 ' 59.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2764.3097	KM	DX	-.01150656	KM/SEC
Y	-6912.9933	KM	DY	.01548739	KM/SEC
Z	-1861.6163	KM	DZ	-.51026762	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	58.27	M	DX	.01116 M/S	X	.0000	M	DX	.0000 M/S
Y	183.2	M	DY	.03029 M/S	Y	.0000	M	DY	.0000 M/S
Z	473.6	M	DZ	.01114 M/S	Z	.0000	M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.11	KM	ECC	.618576		APF	1.32478	DEG
LAN	92.4319	DEG	INC	84.5871	DEG	TFP	12748.6	SEC
RCA	1838.88	KM	PALT	100.794	KM	PER	500.653	MIN
APO	7803.33	KM	AALT	6065.24	KM	TA	171.746	DEG
LAT	6.89813	DEG	LONG	271.775	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/283 MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17684000E-04	C31	+.22722000E-04
C32	+.13632377E-04	C33	+.13090960E-04	C41	-.32630998E-05
C42	+.21463582E-04	C43	-.36916171E-05	C44	-.11966065E-06
S21	-.55149998E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.26740954E-04	S33	-.14593194E-04	S41	+.67981998E-05
S42	-.69983594E-05	S43	-.24312120E-05	S44	-.22618843E-05

5.7 DATA ARC LENGTH' 14 HRS 0 MIN SOS= 228.97

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/1735	219/1913	96	.0134	-.0008
62	CC3	219/1500	219/1728	56	.0091	.0220
41	C3	219/2345	220/0207	141	.0483	.0098
41	CC3	220/0217	220/0435	132	.0564	.0122
12	C3	219/1534	220/0331	99	.0337	.0181
12	CC3	219/1735	220/0208	489	.0638	.0063

5.9 RESIDUAL PLOTS' TAPE NO. 12531 ITEM NO.

5.10REMARKS' GOOD OD. CONVERGED VERY QUICKLY. THIS IS A RERU
N FROM AN EARLIER 5216,WHICH HAD A BAD EPOCH FORWARD.

TIME OF REPORT'
DAY 220 , 07 HR , 35 MIN GMT

PREPARED BY' D.S. MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5318 TAPE NO. 11939
ITEM NO.

5.2 EPOCH DAY 219 , 14 ' 59 ' 59.000 GMT SEQ. NO. 0065
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2764.3978	KM	DX	-.01152808	KM/SEC
Y	-6913.4313	KM	DY	.01541654	KM/SEC
Z	-1860.4592	KM	DZ	-.51026072	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	55.90 M	DX .00949 M/S	X	10000 M	DX 100.00 M/S
Y	141.4 M	DY .02524 M/S	Y	10000 M	DY 100.00 M/S
Z	385.3 M	DZ .00882 M/S	Z	10000 M	DZ 100.00 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.18	KM	ECC	.618577		APF	1.31493	DEG
LAN	92.4323	DEG	INC	84.5866	DEG	TFP	12749.0	SEC
RCA	1838.91	KM	PALT	100.818	KM	PER	500.664	MIN
APO	7803.45	KM	AALT	6065.36	KM	TA	171.747	DEG
LAT	6.90724	DEG	LONG	271.775	DEG			

5.6 LUNAR HARMONICS USED' LRC 11/11 MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.17672332E-04	C33	+.32431485E-04	C41	-.32630999E-05
C42	+.17117445E-04	C43	-.35309835E-05	C44	+.28900017E-05
S21	-.55149999E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.24250181E-04	S33	+.14074318E-04	S41	+.67981999E-05
S42	-.42424842E-05	S43	-.36363553E-05	S44	-.44545749E-05

5.7 DATA ARC LENGTH' 17 HRS 50 MIN SOS= 988.08

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	219/1735	219/1913	96	.0805	.0860
62	CC3	219/1500	219/1728	164	.2440	-.0790
62	C3	220/0831	220/0848	16	.0075	.0385
41	C3	219/2345	220/0207	141	.0486	-.0074
41	CC3	220/0217	220/0849	365	.0448	.0046
12	C3	219/1534	220/0331	176	.0952	.0532
12	CC3	219/1735	220/0208	489	.0676	.0136

5.9 RESIDUAL PLOTS' TAPE NO. 12552 ITEM NO.

5.10REMARKS' FAIR FIT, BUT READOUT DAT FROM 1500 TO 1700
ON DAY 219 THROWS IT OFF. STILL INPUTTING APRIORI.
WILL ATTEMPT TO CLEAN UP THE DATA EXTENSIVELY FOR NEXT OD
THE KING IS A FINK

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5320 TAPE NO. 11930
ITEM NO.

5.2 EPOCH DAY 219 , 23 ' 0 ' 0.000 GMT SEQ. NO. 0066
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2730.9734	KM	DX	-.04960732	KM/SEC
Y	-6876.2752	KM	DY	-.08035026	KM/SEC
Z	-1209.0745	KM	DZ	-.53119746	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	179.3 M	DX	.01567 M/S	X	240808 M	DX	177.0 M/S
Y	255.2 M	DY	.03523 M/S	Y	352736 M	DY	379.9 M/S
Z	571.0 M	DZ	.03531 M/S	Z	.0000 M	DZ	162.3 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.53	KM	ECC	.618667		APF	1.22650	DEG
LAN	88.0187	DEG	INC	84.5662	DEG	TFP	11522.8	SEC
RCA	1838.61	KM	PALT	100.516	KM	PER	500.718	MIN
APO	7804.45	KM	AALT	6066.36	KM	TA	167.088	DEG
LAT	11.6327	DEG	LONG	266.897	DEG			

5.6 LUNAR HARMONICS USED' LRC 11/11 MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	-.48809511E-04	C33	+.60189211E-04	C41	-.32630998E-05
C42	+.11107478E-04	C43	-.11584929E-05	C44	+.10930801E-04
S21	-.55149998E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.43453095E-05	S33	+.90981255E-04	S41	+.67981998E-05
S42	-.47617379E-05	S43	+.82578373E-06	S44	-.84079266E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 43.826

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	220/0831	220/0917	45	.0726	-.0120
62	CC3	220/0923	220/1159	138	.0234	.0030
41	C3	219/2345	220/0959	158	.0229	-.0172
41	CC3	220/0217	220/0918	383	.0281	.0023
12	C3	220/0217	220/0331	71	.0243	-.0350
12	CC3	219/2300	220/0208	165	.0209	.0052

5.9 RESIDUAL PLOTS' TAPE NO. 11477 ITEM NO.

5.10REMARKS' LOST ITNO 4 FROM OD 5318 PUNCHED UP CONVERGED CONDITIONS AND RESTARTED PROGRAM NOW OPERATING CORRECTLY
GOOD CONVERGENCE IN 4 ITERATIONS
DATA SEEMS TO BE MUCH CLEANER SINCE LATEST ODGX RUN

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 220 , 15 HR , 09 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5122 TAPE NO. 11940
ITEM NO. N.A.

5.2 EPOCH DAY 219 , 23 ' 0 ' 0.000 GMT SEQ. NO. 0069
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2730.0515	KM	DX	-.04968593	KM/SEC
Y	-6875.1170	KM	DY	-.08046480	KM/SEC
Z	-1207.1312	KM	DZ	-.53135540	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	57.86 M	DX	.00713 M/S	X	.0000 M	DX	.0000 M/S
Y	101.8 M	DY	.02519 M/S	Y	.0000 M	DY	.0000 M/S
Z	388.1 M	DZ	.01100 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.03	KM	ECC	.618500		APF	1.22158	DEG
LAN	88.0207	DEG	INC	84.5707	DEG	TFP	11520.2	SEC
RCA	1839.22	KM	PALT	101.131	KM	PER	500.641	MIN
APO	7802.84	KM	AALT	6064.75	KM	TA	167.079	DEG
LAT	11.6459	DEG	LONG	266.898	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.28164572E-04	C33	-.47193779E-05	C41	-.32630998E-05
C42	+.20857452E-04	C43	-.49664133E-05	C44	-.52821395E-05
S21	-.55149997E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.29378941E-04	S33	-.59966180E-04	S41	+.67981997E-05
S42	-.11024650E-04	S43	-.46887851E-05	S44	+.38030374E-06

5.7 DATA ARC LENGTH: 18 HRS 0 MIN SOS= 141.25

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	220/0831	220/0853	21	.0067	-.0066
62	CC3	220/0923	220/1656	343	.0423	.0077
41	C3	219/2345	220/0959	158	.0198	-.0059
41	CC3	220/0217	220/0918	364	.0453	.0035
12	C3	220/0217	220/0331	71	.0264	-.0160
12	CC3	219/2300	220/0208	165	.0177	-.0022

5.9 RESIDUAL PLOTS: TAPE NO. 12547 ITEM NO. N.A.

5.10 REMARKS: DELETED THE FOLLOWING DATA. READOUT FROM 220/0854 TO 220/0918 AND A ROLL PITCH MANEUVER FROM 220/1442 TO 220/1502. THE RESULTANT O.D. IS VERY GOOD. MAPPINGS ARE MADE TO SITE A-12 AND SECOND TRANSFER.

TIME OF REPORT: PREPARED BY: PAUL HUNTRESS (R)
DAY 220 , 19 HR , 49 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5124 — TAPE NO. 12583; ITEM NO. N.A.; SEQ. NO. 0071; COMPUTER W

5.2 EPOCH DAY 220 , 7 HR , 30 MIN , 0.000 SEC GMT

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2756.5273	KM	DX	-.03214111	KM/SEC
Y	-6910.3704	KM	DY	-.03590462	KM/SEC
Z	-1498.1322	KM	DZ	-.52229332	KM/SEC

5.4 STANDARD DEVIATIONS — A PRIORI

X	57.66 M	DX	.00655 M/S	X	.0000 M	DX	.0000 M/S
Y	83.85 M	DY	.02326 M/S	Y	.0000 M	DY	.0000 M/S
Z	365.4 M	DZ	.00971 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.22	KM	ECC	.618557		APF	1.12602	DEG
LAN	83.3329	DEG	INC	84.5799	DEG	TFP	12096.3	SEC
RCA	1839.02	KM	PALT	100.933	KM	PER	500.670	MIN
APO	7803.42	KM	AALT	6065.33	KM	TA	169.294	DEG
LAT	9.53459	DEG	LONG	262.420	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.21830676E-04	C33	-.13393903E-05	C41	-.32630998E-05
C42	+.77353209E-05	C43	-.48780743E-05	C44	-.19197267E-05
S21	-.55149996E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.26811238E-04	S33	-.23473098E-04	S41	+.67981996E-05
S42	-.83855562E-05	S43	-.36725947E-05	S44	+.15409518E-06

5.7 DATA ARC LENGTH: 14 HRS 30 MIN — SOS= 141.12

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	220/0831	220/1928	81	.0072	.0020
62	CC3	220/0923	220/1818	393	.0455	.0048
41	C3	220/0924	220/0959	36	.0063	.0002
41	CC3	220/0730	220/0918	72	.0178	-.0057
12	C3	220/1807	220/1816	10	.0049	.0157
12	CC3	220/1824	220/2159	210	.0527	.0041

5.9 RESIDUAL PLOTS: TAPE NO. 11474 ITEM NO. N.A.

5.10 REMARKS: DELETED THE FOLLOWING DATA. READOUT FROM 220/0854 TO 220/0918 AND A ROLL PITCH MANEUVER FROM 220/1442 TO 220/1502.

TIME OF REPORT: DAY 220 , 23 HR , 43 MIN GMT — PREPARED BY: HAMILTON 0000(R) O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5226 TAPE NO. 12614
ITEM NO.

5.2 EPOCH DAY 220 , 16 ' 0 ' 0.000 GMT SEQ. NO.
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-2773.0189	KM	DX	-.01531741	KM/SEC
Y	-6921.9080	KM	DY	.00732612	KM/SEC
Z	-1784.1337	KM	DZ	-.51164344	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	424.8 M	DX	.04248 M/S	X	.0000 M	DX	.0000 M/S
Y	424.2 M	DY	.18986 M/S	Y	.0000 M	DY	.0000 M/S
Z	2932 M	DZ	.08459 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	4821.66	KM	ECC	.618766		APF	1.04007	DEG
LAN	78.6460	DEG	INC	84.6219	DEG	TFP	12672.1	SEC
RCA	1838.08	KM	PALT	99.9938	KM	PER	500.739	MIN
APO	7805.24	KM	AALT	6067.15	KM	TA	171.458	DEG
LAT	7.46913	DEG	LONG	257.939	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	-.62774001E-04	C33	+.68546917E-04	C41	-.32630998E-05
C42	-.23065250E-04	C43	-.30778004E-05	C44	+.13950552E-04
S21	-.55149996E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	-.17009424E-04	S33	+.14239512E-03	S41	+.67981996E-05
S42	+.46767369E-06	S43	+.42215138E-05	S44	-.98635706E-05

5.7 DATA ARC LENGTH' 9 HRS 10 MIN SOS= 53.135

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	220/1825	220/1928	60	.0136	.0007
62	CC3	220/1600	220/1818	88	.0436	.0006
12	C3	220/1807	220/1816	10	.0049	.0199
12	CC3	220/1824	221/0103	387	.0310	.0013

5.9 RESIDUAL PLOTS' TAPE NO. 11476 ITEM NO.

5.10REMARKS' GOOD OD. CONVERGED RAPIDLY. COMPARES WELL WITH PREVIOUS ODS.

TIME OF REPORT' PREPARED BY' D.S. MCKELLAR (W)
DAY 221 , 02 HR , 01 MIN GMT O.D. ANALYST

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 5177 ITEM NO. 740

TAPE NO. 11953

5.2 EPOCH: DAY 67/08/08 16 : 0 : 0.0 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X -2772.0621 km $\dot{X}$ -0.015394566 km/sec
Y -6921.1888 km $\dot{Y}$ 0.007060947 km/sec
Z -1779.7168 km $\dot{Z}$ -0.511842314 km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X 55.3 m $\dot{X}$ .0063 m/s X ___ m $\dot{X}$ ___ m/sec
Y 105.7 m $\dot{Y}$ .036 m/s Y ___ m $\dot{Y}$ ___ m/sec
Z 565.8 m $\dot{Z}$ .0079 m/s Z ___ m $\dot{Z}$ ___ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a 4821.02 km e 0.6186000 ω 1.016 deg.
Ω 38.507 deg i 84.619 deg Tp 12668.6 sec
r_p 1838.73 km h_p 100.64 km P 500.637 min
r_a 7803.30 km h_a 6665.21 km Tan 171.45 deg

5.6 LUNAR HARMONICS USED: LRC 72.05 MOD. LAT: 7.5001 LONG: 257.937

5.7 DATA ARC LENGTH: 13 hrs 6 min. SOS = 137.05

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	8/08-1825	8/08-1928	60	.0064	-.040
	CC3	8/08-1600	8/08-1818	88	.051	.00266
41	C3	8/09-0115	8/09-0217	57	.0108	-.0074
	CC3	8/09-0325	8/09-0506	145	.045	-.0031
12	C3	8/08-1847	8/09-0413	112	.046	.019
	CC3	8/08-1824	8/09-0218	459	.032	.0023

5.9 RESIDUAL PLOTS: TAPE NO. ___ ITEM NO. ___

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: ___

TIME OF REPORT: Prepared by: ___ R W B
DAY , hr min GMT O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6202 TAPE NO. 12580
ITEM NO. N.A.

5.2 EPOCH DAY 221 , 5 ' 11 ' 4.254 GMT SEQ. NO. 0072
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	626.80066	KM	DX	-.23409906	KM/SEC
Y	1525.1233	KM	DY	-.75976907	KM/SEC
Z	810.46258	KM	DZ	1.6649592	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	18.13 M	DX	.13421 M/S	X	680.3 M	DX	100.00 M/S
Y	204.3 M	DY	.30422 M/S	Y	2148 M	DY	100.00 M/S
Z	338.5 M	DZ	.18826 M/S	Z	5440 M	DZ	100.00 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.86	KM	ECC	.276034		APF	1.79640	DEG
LAN	71.3903	DEG	INC	84.7398	DEG	TFP	59.6232	SEC
RCA	1836.60	KM	PALT	98.5130	KM	PER	191.100	MIN
APO	3237.12	KM	AALT	1499.03	KM	TA	3.43200	DEG
LAT	5.20632	DEG	LONG	71.8710	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

5.7 DATA ARC LENGTH' 2 HRS 16 MIN SOS= 6.0235

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	CC3	221/0534	221/0650	63	.0311	-.0001

5.9 RESIDUAL PLOTS' TAPE NO. 12542 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGENCE RAPID, BUT DATA ARC SHORT

TIME OF REPORT' PREPARED BY' J.W. UNDERWOOD (W)
DAY 221 , 07 HR , 31 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6204

TAPE NO. 12582
ITEM NO. N.A.
SEQ. NO. 0073
COMPUTER w

5.2 EPOCH DAY 221 , 5 ' 11 ' 4.254 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	626.94687	KM	DX	-.23451475	KM/SEC
Y	1524.2128	KM	DY	-.76203477	KM/SEC
Z	812.99931	KM	DZ	1.6635890	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	14.79 M	DX .01216 M/S	X	680.3 M	DX 100.00 M/S
Y	141.4 M	DY .27495 M/S	Y	2148 M	DY 100.00 M/S
Z	251.6 M	DZ .12678 M/S	Z	5440 M	DZ 100.00 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.24	KM	ECC	.275979		APF	1.87529	DEG
LAN	71.3799	DEG	INC	84.7557	DEG	TFP	59.7208	SEC
RCA	1837.02	KM	PALT	98.9261	KM	PER	191.143	MIN
APO	3237.46	KM	AALT	1499.37	KM	TA	3.43638	DEG
LAT	5.28937	DEG	LONG	71.8668	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

5.7 DATA ARC LENGTH' 3 HRS 10 MIN SOS= 512.56

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	CC3	221/0534	221/0820	150	.1861	-.0102

5.9 RESIDUAL PLOTS' TAPE NO. 12617 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGED RAPIDLY. COMPARES WELL WITH OD 6202,WHICH HAD LITTLE MORE THAN 1 HOUR OF DATA. THIS OD USES NEARLY ONE FULL ORBIT OF DATA.

TIME OF REPORT' DAY 221 , 08 HR , 53 MIN GMT

PREPARED BY' J.W. UNDERWOOD (w)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6308 TAPE NO. 12570
ITEM NO.

5.2 EPOCH DAY 221 , 7 ' 20 ' 0.000 GMT SEQ. NO. 0074
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-572.73309	KM	DX	.40466943	KM/SEC
Y	-1210.7056	KM	DY	1.0620057	KM/SEC
Z	-2650.0873	KM	DZ	-.28158438	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	45.29 M	DX	.00903 M/S	X	3.995 M	DX	.0024 M/S
Y	515.2 M	DY	.09161 M/S	Y	119.7 M	DY	.0115 M/S
Z	202.8 M	DZ	.13752 M/S	Z	56.11 M	DZ	.0489 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2538.53	KM	ECC	.276769		APF	1.82836	DEG
LAN	70.2125	DEG	INC	84.7237	DEG	TFP	-3675.59	SEC
RCA	1835.94	KM	PALT	97.8531	KM	PER	191.289	MIN
APO	3241.11	KM	AALT	1503.02	KM	TA	220.465	DEG
LAT	317.927	DEG	LONG	254.995	DEG			

5.6 LUNAR HARMONICS USED: LRC 11/11 MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.20207624E-04	C33	+.37158448E-05	C41	-.32630999E-05
C42	-.13581747E-04	C43	-.12454662E-05	C44	+.77000768E-05
S21	-.55149999E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.14482690E-04	S33	+.96787319E-04	S41	+.67981999E-05
S42	-.22626879E-05	S43	-.41052440E-05	S44	-.38475846E-05

5.7 DATA ARC LENGTH: 4 HRS 0 MIN SOS= 176.55

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/0948	221/0957	10	.0432	.0158
62	CC3	221/1003	221/1119	63	.1193	.0080
41	C3	221/1004	221/1119	74	.1364	-.0180
41	CC3	221/0720	221/0958	144	.0916	-.0016

5.9 RESIDUAL PLOTS: TAPE NO. 11909 ITEM NO.

5.10 REMARKS: FIRST SOLVE FOR STATE AND DS1 ONLY SOS=E04 AND DELQS SMALL AFTER 3 ITERATIONS TRY SOLVING FOR HARMONICS GOOD CONVERGENCE AFTER ITERATION 6 HARMONICS HELPED

TIME OF REPORT: PREPARED BY: BUNCE (B)
DAY 221 , 13 HR , 02 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6310 TAPE NO. 11461
ITEM NO.

5.2 EPOCH DAY 221 , 7 ' 20 ' 0.000 GMT SEQ. NO. 0075
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-572.66900	KM	DX	.40466964	KM/SEC
Y	-1208.4244	KM	DY	1.0626192	KM/SEC
Z	-2649.4318	KM	DZ	-.28183486	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	21.07 M	DX	.00501 M/S	X	.0000 M	DX	.0000 M/S
Y	253.6 M	DY	.04584 M/S	Y	.0000 M	DY	.0000 M/S
Z	120.6 M	DZ	.07852 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2538.20	KM	ECC	.276017		APF	1.83266	DEG
LAN	70.2107	DEG	INC	84.7445	DEG	TFP	-3676.08	SEC
RCA	1837.61	KM	PALT	99.5208	KM	PER	191.251	MIN
APO	3238.78	KM	AALT	1500.69	KM	TA	220.493	DEG
LAT	317.894	DEG	LONG	254.979	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/26B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.54417678E-04	C33	+.22749364E-04	C41	-.32630998E-05
C42	-.85236485E-05	C43	+.13458793E-06	C44	+.27082400E-05
S21	-.55149998E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.35993073E-04	S33	+.29545555E-04	S41	+.67981998E-05
S42	-.24135127E-05	S43	-.54144841E-05	S44	-.29150555E-05

5.7 DATA ARC LENGTH' 7 HRS 10 MIN SOS= 615.51

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/0948	221/0957	10	.0163	-.1498
62	CC3	221/1003	221/1429	241	.1356	.0183
41	C3	221/1004	221/1119	74	.1168	-.0302
41	CC3	221/0720	221/0958	144	.1231	-.0190

5.9 RESIDUAL PLOTS' TAPE NO. 12619 ITEM NO.

5.10REMARKS' RUNNING MODE 4

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 221 , 16 HR , 36 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6312 TAPE NO. 11517
ITEM NO.

5.2 EPOCH DAY 221 , 7 ' 20 ' 0.000 GMT SEQ. NO. 0076
HR MIN SEC COMPUTER *

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-572.75785	KM	DX	.40468416	KM/SEC
Y	-1206.4382	KM	DY	1.0630533	KM/SEC
Z	-2649.0999	KM	DZ	-.28162792	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	18.86 M	DX	.00469 M/S	X	.0000 M	DX	.0000 M/S
Y	198.4 M	DY	.02686 M/S	Y	.0000 M	DY	.0000 M/S
Z	110.3 M	DZ	.07122 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.68	KM	ECC	.275714		APF	1.84837	DEG
LAN	70.2066	DEG	INC	84.7634	DEG	TFP	-3675.34	SEC
RCA	1838.01	KM	PALT	99.9156	KM	PER	191.193	MIN
APO	3237.36	KM	AALT	1499.27	KM	TA	220.506	DEG
LAT	317.863	DEG	LONG	254.963	DEG			

UNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.54983073E-04	C33	+.17539523E-04	C41	-.32630998E-05
C42	-.41133649E-05	C43	+.78528596E-06	C44	-.21480278E-07
S21	-.55149998E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.29018586E-04	S33	-.94812226E-05	S41	+.67931998E-05
S42	+.45286015E-06	S43	-.43914946E-05	S44	-.50461978E-06

5.7 DATA ARC LENGTH' 9 HRS 10 MIN SOS= 1366.8

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/0948	221/0957	10	.0273	-.1111
62	CC3	221/1003	221/1629	350	.1827	-.0021
41	C3	221/1004	221/1119	74	.0818	-.0100
41	CC3	221/0720	221/0958	144	.1559	-.0039

5.9 RESIDUAL PLOTS' TAPE NO. 11232 ITEM NO.

5.10REMARKS' RUNNING MODE 4

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 221 , 18 HR , 08 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6114 — TAPE NO. 154Y, ITEM NO. 000000

5.2 EPOCH DAY 221 , 7 HR ' 20 MIN ' 0.000 SEC GMT — SEQ. NO. 0077, COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-572.75766	KM	DX	.40469278	KM/SEC
Y	-1206.7242	KM	DY	1.0629359	KM/SEC
Z	-2649.3284	KM	DZ	-.28146742	KM/SEC

5.4 STANDARD DEVIATIONS — A PRIORI

X	13.77 M	DX	.00344 M/S	X	.0000 M	DX	.0000 M/S
Y	142.0 M	DY	.01423 M/S	Y	.0000 M	DY	.0000 M/S
Z	85.77 M	DZ	.05257 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.71	KM	ECC	.275900		APF	1.85282	DEG
LAN	70.2063	DEG	INC	84.7599	DEG	TFP	-3675.12	SEC
RCA	1837.56	KM	PALT	99.4673	KM	PER	191.196	MIN
APO	3237.87	KM	AALT	1499.78	KM	TA	220.499	DEG
LAT	317.866	DEG	LONG	254.965	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917200E-03	J30	-.17382000E-04	J40	-.37928000E-04
C21	-.15706000E-06	C22	+.17664000E-04	C31	+.22722000E-04
C32	+.41584871E-04	C33	+.14660786E-04	C41	-.32630998E-05
C42	-.54040606E-05	C43	+.22357982E-05	C44	+.85202087E-06
S21	-.55149997E-05	S22	-.16673000E-05	S31	-.13551000E-04
S32	+.28368563E-04	S33	+.50955735E-05	S41	+.67981997E-05
S42	+.35819512E-05	S43	-.34601034E-05	S44	-.77111231E-06

5.7 DATA ARC LENGTH' 13 HRS 0 MIN — SOS= 2398.2

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/0948	221/2019	61	.1040	-.0317
62	CC3	221/1003	221/1913	479	.2056	.0277
41	C3	221/1004	221/1119	74	.0976	.0023
41	CC3	221/0720	221/0958	144	.1651	-.0393
12	C3	221/1842	221/1911	30	.1798	-.0602
12	CC3	221/1919	221/2019	61	.1570	-.0062

5.9 RESIDUAL PLOTS' TAPE NO. 12538 ITEM NO.

5.10REMARKS' RUNNING MODE 4

TIME OF REPORT' DAY 221 , 22 HR , 03 MIN GMT — PREPARED BY' HAMILTON COOOIRI O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6116

TAPE NO. 11910
ITEM NO. N.A.
SEQ. NO. 0078
COMPUTER V

5.2 EPOCH DAY 221 , 13 ' 45 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-508.70303	KM	DX	.42137933	KM/SEC
Y	-1043.3581	KM	DY	1.0972237	KM/SEC
Z	-2682.3358	KM	DZ	-.20338827	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	10.46	M	DX	.00124	M/S	X	.0000	M	DX .0000 M/S
Y	132.9	M	DY	.01129	M/S	Y	.0000	M	DY .0000 M/S
Z	61.78	M	DZ	.05179	M/S	Z	.0000	M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.60	KM	ECC	.276113		APF	1.52206	DEG
LAN	66.6877	DEG	INC	84.7249	DEG	TFP	-3509.06	SEC
RCA	1836.92	KM	PALT	98.8311	KM	PER	191.183	MIN
APO	3238.27	KM	AALT	1500.18	KM	TA	224.196	DEG
LAT	314.530	DEG	LONG	252.073	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

J20	+.20917200E-03	J30 -.17382000E-04	J40 -.37928000E-04
C21	-.15706000E-06	C22 +.17664000E-04	C31 +.22722000E-04
C32	+.23978798E-04	C33 +.18959753E-04	C41 -.32630998E-05
C42	-.41765497E-05	C43 +.27605350E-05	C44 -.51626354E-06
S21	-.88149996E-06	S22 -.16673000E-05	S31 +.13551000E-04
S32	+.15420269E-04	S33 -.30240922E-05	S41 +.67981996E-06
S42	+.85521840E-06	S43 -.31375967E-05	S44 -.11857532E-05

5.7 DATA ARC LENGTH' 12 HRS 55 MIN SOS= 5597.2

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/1919	221/2058	83	.2381	-.0436
62	CC3	221/1345	221/1913	280	.2700	.0747
41	C3	222/0219	222/0239	21	.2322	.0005
12	C3	221/1842	221/1911	30	.0728	-.0592
12	CC3	221/1919	222/0238	420	.2960	.0250

5.9 RESIDUAL PLOTS' TAPE NO. 12615 ITEM NO. N.A.

5.10REMARKS' CONVERGED IN 4 ITERATIONS

TIME OF REPORT'
DAY 252 , 04 HR , 15 MIN GMT

PREPARED BY' HAMILTON (R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6218

TAPE NO. 11930
ITEM NO.
SEQ. NO. 0080
COMPUTER D

5.2 EPOCH DAY 221 , 20 ' 7 ' 24.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-509.22735	KM	DX	.42190378	KM/SEC
Y	-1042.5619	KM	DY	1.0932427	KM/SEC
Z	-2680.0766	KM	DZ	-.20273678	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	14.48	M	DX	.00277	M/S	X	106.2	M	DX .0249 M/S
Y	125.5	M	DY	.01092	M/S	Y	316.6	M	DY .0570 M/S
Z	57.99	M	DZ	.04739	M/S	Z	70.10	M	DZ .1447 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.35	KM	ECC	.276383		APF	1.33711	DEG
LAN	63.1764	DEG	INC	84.7351	DEG	TFP	-3499.74	SEC
RCA	1836.07	KM	PALT	97.9822	KM	PER	191.156	MIN
APO	3238.63	KM	AALT	1500.54	KM	TA	224.376	DEG
LAT	314.534	DEG	LONG	248.551	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.30477018E-04	C33	+.16679053E-04	C41	-.32631249E-05
C42	-.35843756E-05	C43	+.12141347E-05	C44	-.13897544E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.12497584E-04	S33	+.16906500E-05	S41	+.67981786E-05
S42	+.10368121E-04	S43	-.36360399E-06	S44	-.10481293E-05

5.7 DATA ARC LENGTH: 13 HRS 0 MIN SOS= 9919.3

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	221/2007	221/2058	43	.6041	-.0602
41	C3	222/0219	222/0247	29	.1212	.1900
41	CC3	222/0256	222/0901	315	.4166	.0973
12	C3	222/0256	222/0501	120	.4851	.1462
12	CC3	221/2007	222/0248	334	.3631	.1155

5.9 RESIDUAL PLOTS: TAPE NO. 11798 ITEM NO.

5.10 REMARKS: GOOD OD. CONVERGED RAPIDLY. COMPARES WELL WITH PREVIOUS ODS.

TIME OF REPORT:
DAY 252 , 13 HR , 27 MIN GMT

PREPARED BY: D.S. MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6320 TAPE NO. 12501
ITEM NO.

5.2 EPOCH DAY 222 , 5 ' 40 ' 0.000 GMT SEQ. NO. 0083
HR MIN SEC COMPUTER 8

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-535.76422	KM	DX	.41626388	KM/SEC
Y	-1093.1104	KM	DY	1.0883030	KM/SEC
Z	-2669.6660	KM	DZ	-.22810359	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	22.36 M	DX	.00450 M/S	X	.0000 M	DX	.0000 M/S
Y	115.9 M	DY	.01156 M/S	Y	.0000 M	DY	.0000 M/S
Z	49.67 M	DZ	.04365 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.48	KM	ECC	.276324		APF	1.35672	DEG
LAN	57.8918	DEG	INC	84.8721	DEG	TFP	-3549.20	SEC
RCA	1836.32	KM	PALT	98.2251	KM	PER	191.171	MIN
APO	3238.65	KM	AALT	1500.56	KM	TA	223.266	DEG
LAT	315.603	DEG	LONG	242.933	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.48727367E-04	C33	+.85346635E-05	C41	+.32631249E-05
C42	-.14360775E-05	C43	-.15847266E-05	C44	-.23598378E-05
S21	-.55190425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.11014795E-04	S33	-.22775543E-04	S41	+.67951786E-05
S42	+.85174556E-05	S43	-.45997790E-05	S44	+.23387612E-06

5.7 DATA ARC LENGTH: 12 HRS 45 MIN SOS= 5732.9

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	222/1121	222/1149	23	.0501	.0274
62	CC3	222/1153	222/1824	332	.2722	.0695
41	C3	222/1153	222/1219	25	.0852	.0356
41	CC3	222/0540	222/1148	291	.3333	.0145
12	C3	222/1820	222/1824	5	.0101	-.0058

5.9 RESIDUAL PLOTS: TAPE NO. 11798 ITEM NO.

5.10 REMARKS: A FAIR OD COMPARED TO PREVIOUS ONES
ROLL MANEUVERS TAKEN OUT VIA ODGX....ALSO BY START-STOP TIMES
THIS IMPROVED FIT

TIME OF REPORT: PREPARED BY: CLARK (B)
DAY 252 , 20 HR , 55 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6122 — TAPE NO. 11923 ; ITEM NO. N.A.

5.2 EPOCH DAY 222 , 12 ' 0 ' 0.000 GMT (HR MIN SEC) — SEQ. NO. 0085 ; COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-595.37875	KM	DX	.40102049	KM/SEC
Y	-1236.8636	KM	DY	1.0582992	KM/SEC
Z	-2634.1848	KM	DZ	-.29645476	KM/SEC

5.4 STANDARD DEVIATIONS — A PRIORI

X	37.22 M	DX .01188 M/S	X	.0000 M	DX .0000 M/S
Y	158.1 M	DY .02037 M/S	Y	.0000 M	DY .0000 M/S
Z	68.75 M	DZ .05770 M/S	Z	.0000 M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.22	KM	ECC	.276440		APF	1.39831	DEG
LAN	54.3856	DEG	INC	84.9690	DEG	TFP	-3685.30	SEC
RCA	1835.83	KM	PALT	97.7419	KM	PER	191.141	MIN
APO	3238.61	KM	AALT	1500.52	KM	TA	220.212	DEG
LAT	318.585	DEG	LONG	238.839	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17564317E-04	C31	+.22722029E-04
C32	+.37380940E-04	C33	-.50893957E-05	C41	-.32631249E-05
C42	+.10104962E-05	C43	-.22964111E-05	C44	-.82244325E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.17557772E-05	S33	-.22937526E-04	S41	+.67981786E-05
S42	+.64908303E-05	S43	-.20419849E-05	S44	+.11343503E-05

5.7 DATA ARC LENGTH' 12 HRS 50 MIN SOS= 5317.4

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	222/1914	222/2118	97	.4051	-.0167
62	CC3	222/1202	222/1908	356	.3066	.0545
41	C3	222/1200	222/1219	18	.1211	.0090
12	C3	222/1820	222/1906	45	.1222	.0185
12	CC3	222/1914	223/0044	285	.2825	.0219

5.9 RESIDUAL PLOTS' TAPE NO. 11899 ITEM NO. N.A.

5.10REMARKS' ONE HOUR LOST DUE TO COMPUTER RESTART PROBLEMS

TIME OF REPORT' DAY 223 , 03 HR , 36 MIN GMT — PREPARED BY' HAMILTON (R) O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6124 TAPE NO. 11242
ITEM NO. N.A.

5.2 EPOCH DAY 222 , 18 ' 25 ' 0.000 GMT SEQ. NO. 0086
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-529.97293	KM	DX	.41871793	KM/SEC
Y	-1063.5644	KM	DY	1.0939239	KM/SEC
Z	-2674.5576	KM	DZ	-.21446852	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	41.43 M	DX	.01271 M/S	X	.0000 M	DX	.0000 M/S
Y	148.0 M	DY	.01377 M/S	Y	.0000 M	DY	.0000 M/S
Z	64.12 M	DZ	.03635 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2537.16	KM	ECC	.276664		APF	1.32563	DEG
LAN	50.8474	DEG	INC	84.9682	DEG	TFP	-3520.53	SEC
RCA	1835.22	KM	PALT	97.1336	KM	PER	191.135	MIN
APO	3239.11	KM	AALT	1501.02	KM	TA	223.673	DEG
LAT	315.023	DEG	LONG	235.895	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/288 MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58006
J20	+.20917163E-03	J30	-.17382163E-04	J40	-.37923499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.28198344E-04	C33	+.11527656E-05	C41	-.32631249E-05
C42	+.11095062E-05	C43	-.23349676E-05	C44	-.58065032E-06
S21	-.55150423E-05	S22	-.16672685E-05	S31	-.13551229E-04
S32	+.14429096E-05	S33	-.11729587E-04	S41	+.67951756E-05
S42	+.56023631E-05	S43	-.90223997E-06	S44	+.40119269E-06

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 5512.1

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	222/1914	222/2118	95	.4256	.0162
62	CC3	222/1825	222/1908	32	.2219	.2362
41	C3	223/0409	223/0412	4	.0058	.2052
41	CC3	223/0420	223/0709	159	.2638	-.0631
12	C3	222/1825	223/0520	93	.3573	.0632
12	CC3	222/1914	223/0413	458	.2983	.0471

5.9 RESIDUAL PLOTS' TAPE NO. 11847 ITEM NO. N.A.

5.10REMARKS' CONVG. IN 3 ITREATIONS, A NIELSON FIRST

TIME OF REPORT' PREPARED BY' NIELSON (R)
DAY 223 , 08 HR , 53 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO.L 6226 TAPE NO. 11828
ITEM NO. N.A.

5.2 EPOCH DAY 223 , 0 ' 50 ' 0.000 GMT SEQ. NO. 0088
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-461.66289	KM	DX	.43518736	KM/SEC
Y	-884.24780	KM	DY	1.1258327	KM/SEC
Z	-2700.6369	KM	DZ	-.12746567	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	40.40 M	DX	.01116 M/S	X	.0000 M	DX	.0000 M/S
Y	111.1 M	DY	.00960 M/S	Y	.0000 M	DY	.0000 M/S
Z	33.55 M	DZ	.04134 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.71	KM	ECC	.276765		APF	1.23753	DEG
LAN	47.3088	DEG	INC	84.9706	DEG	TFP	-3354.49	SEC
RCA	1834.64	KM	PALT	96.5465	KM	PER	191.083	MIN
APO	3238.78	KM	AALT	1500.69	KM	TA	227.669	DEG
LAT	311.345	DEG	LONG	233.049	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28 B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.13716427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.84690477E-05	C33	-.17512673E-04	C41	-.32831249E-05
C42	+.60210[illegible]E-05	C43	-.64151317E-06	C44	+.10412045E-05
S21	-.61150425E-05	S22	-.16472485E-05	S31	-.13551220E-04
S32	+.85[illegible]47[illegible]E-07	S33	-.10688591E-04	S41	+.67981786E-05
S42	+.48[illegible] E-06	S43	+.11423558E-05	S44	+.21538041E-05

5.7 DATA ARC LENGTH: 13 HRS 0 MIN SOS= 3453.1

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	223/1221	223/1316	44	.2592	.7765
62	CC3	223/1324	223/1327	4	.0097	.3804
41	C3	223/1323	223/1329	7	.0226	-.1967
41	CC3	223/0420	223/1319	489	.2199	.0195
12	C3	223/0420	223/0520	53	.4456	.1167
12	CC3	223/0050	223/0348	147	.2760	-.0360

5.9 RESIDUAL PLOTS: TAPE NO. 11947 ITEM NO. N.A.

5.10REMARKS: GOOD OD. CONVERGED IN FOUR ITERATIONS.
GOOD AGREEMENT WITH PREVIOUS ODS.

TIME OF REPORT: PREPARED BY: J W UNDERWOOD (W)
DAY 223 , 15 HR , 45 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6328 TAPE NO. 11265
ITEM NO.

5.2 EPOCH DAY 223 , 7 ' 10 ' 0.000 GMT SEQ. NO.
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-523.30836	KM	DX	.42142980	KM/SEC
Y	-1034.3056	KM	DY	1.0999478	KM/SEC
Z	-2677.7134	KM	DZ	-.20094404	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	44.14 M	DX	.01257 M/S	X	.0000 M	DX	.0000 M/S
Y	107.6 M	DY	.01126 M/S	Y	.0000 M	DY	.0000 M/S
Z	34.54 M	DZ	.03766 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.84	KM	ECC	.276838		APF	1.19147	DEG
LAN	43.8102	DEG	INC	85.0477	DEG	TFP	-3488.49	SEC
RCA	1834.55	KM	PALT	96.4573	KM	PER	191.098	MIN
APO	3239.14	KM	AALT	1501.05	KM	TA	224.573	DEG
LAT	314.455	DEG	LONG	228.877	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.18059983E-04	C33	-.12729338E-04	C41	-.32631249E-05
C42	+.66544349E-05	C43	+.61698803E-06	C44	-.82201379E-08
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.22449829E-05	S33	-.17480180E-04	S41	+.67981786E-05
S42	+.51115856E-05	S43	+.10716145E-05	S44	+.23391779E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4415.6

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	223/1221	223/1316	44	.2702	.0781
62	CC3	223/1324	223/1954	306	.3032	.0343
41	C3	223/1323	223/1329	7	.0185	.3297
41	CC3	223/0710	223/1319	341	.2364	.0476
12	C3	223/1923	223/1954	21	.1742	-.2019

5.9 RESIDUAL PLOTS' TAPE NO. 12538 ITEM NO.

5.10REMARKS' FAIR OD
SOME BLUNDER POINTS REMOVED VIA START - STOP TIMES

TIME OF REPORT' PREPARED BY' CLARK (B)
DAY 223 , 22 HR , 35 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO.6330 TAPE NO. 11826
ITEM NO.

5.2 EPOCH DAY 223 , 13 ' 30 ' 0.000 GMT SEQ. NO. 0090
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-580.74637	KM	DX	.40722482	KM/SEC
Y	-1183.3255	KM	DY	1.0707197	KM/SEC
Z	-2644.0599	KM	DZ	-.27175142	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	81.56 M	DX	.02988 M/S	X	.0000 M	DX	.0000 M/S
Y	172.4 M	DY	.02581 M/S	Y	.0000 M	DY	.0000 M/S
Z	59.57 M	DZ	.05805 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.66	KM	ECC	.276895		APF	1.11628	DEG
LAN	40.3151	DEG	INC	85.0440	DEG	TFP	-3622.27	SEC
RCA	1834.27	KM	PALT	96.1812	KM	PER	191.077	MIN
APO	3239.04	KM	AALT	1500.95	KM	TA	221.547	DEG
LAT	317.534	DEG	LONG	224.867	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.75860555E-05	C33	-.16638443E-04	C41	-.32631249E-05
C42	+.93731304E-05	C43	+.95009951E-06	C44	+.12295918E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.43303765E-05	S33	-.62495698E-05	S41	+.67981786E-05
S42	+.34821068E-05	S43	-.19708978E-06	S44	+.14642743E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4480.5

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	223/2123	223/2149	26	.1394	.1607
62	CC3	223/1330	223/2118	350	.3330	.0793
12	C3	223/1923	223/2113	76	.3065	.0878
12	CC3	223/2123	224/0212	209	.2077	.0433

5.9 RESIDUAL PLOTS' TAPE NO. 11461 ITEM NO.

5.10REMARKS' FAIR OD NO FURTHER DATA REMOVED SINCE 6328

TIME OF REPORT' PREPARED BY' BUNCE (G)
DAY 224 , 04 HR , 33 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6132

TAPE NO. 12533
ITEM NO. N.A.
SEQ. NO. 0091
COMPUTER B

5.2 EPOCH DAY 223 , 19 ' 45 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-749.18255	KM	DX	.35478128	KM/SEC
Y	-1624.2647	KM	DY	.96112026	KM/SEC
Z	-2481.0715	KM	DZ	-.47278344	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	55.08 M	DX	.03005 M/S	X	.0000 M	DX	.0000 M/S
Y	115.8 M	DY	.02920 M/S	Y	.0000 M	DY	.0000 M/S
Z	67.42 M	DZ	.03925 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.79	KM	ECC	.276940		APF	1.10061	DEG
LAN	36.8615	DEG	INC	85.1042	DEG	TFP	-4055.80	SEC
RCA	1834.25	KM	PALT	96.1631	KM	PER	191.093	MIN
APO	3239.33	KM	AALT	1501.24	KM	TA	212.248	DEG
LAT	326.789	DEG	LONG	220.076	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.96826524E-05	C33	-.28999235E-04	C41	-.32631249E-05
C42	+.47135695E-05	C43	+.11832019E-05	C44	+.17747510E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.10147321E-05	S33	-.11630555E-04	S41	+.67981786E-05
S42	+.48902299E-05	S43	+.28009117E-06	S44	+.25521908E-05

5.7 DATA ARC LENGTH' 12 HRS 55 MIN SOS= 5600.6

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	223/2123	223/2149	26	.0925	.0495
62	CC3	223/1945	223/2118	60	.1733	-.0044
41	C3	224/0341	224/0432	49	.1118	.0303
41	CC3	224/0506	224/0839	150	.2762	-.0107
12	C3	223/1945	224/0547	97	.1159	.0272
12	CC3	223/2123	224/0435	313	.4032	.0017

5.9 RESIDUAL PLOTS' TAPE NO. 11887 ITEM NO. N.A.

5.10REMARKS' CONVGD. IN 3 ITER. START STOP TIMES TO DELETE TWO BAD DATA POINTS

TIME OF REPORT'
DAY 224 , 10 HR , 03 MIN GMT

PREPARED BY' HAMILTON (R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6134

TAPE NO. 12634
ITEM NO. N.A.
SEQ. NO. 0092
COMPUTER B

5.2 EPOCH DAY 223 , 23 ' 5 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-543.99354	KM	DX	.41742330	KM/SEC
Y	-1074.6135	KM	DY	1.0924852	KM/SEC
Z	-2668.4634	KM	DZ	-.22082445	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	77.23 M	DX	.02693 M/S	X	.0000 M	DX	.0000 M/S
Y	131.2 M	DY	.01841 M/S	Y	.0000 M	DY	.0000 M/S
Z	37.74 M	DZ	.04267 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.82	KM	ECC	.277006		APF	1.11246	DEG
LAN	35.0262	DEG	INC	85.1371	DEG	TFP	-3522.76	SEC
RCA	1834.10	KM	PALT	96.0129	KM	PER	191.095	MIN
APO	3239.53	KM	AALT	1501.44	KM	TA	223.780	DEG
LAT	315.313	DEG	LONG	219.854	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.62879835E-05	C33	-.27795967E-04	C41	-.32631249E-05
C42	+.17930369E-05	C43	-.25631769E-06	C44	+.13510841E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.89489354E-05	S33	-.16078700E-04	S41	+.67981786E-05
S42	+.70664415E-05	S43	+.11171632E-05	S44	+.30334762E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4174.4

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	C3	224/0341	224/0431	49	.1275	.0448
41	CC3	224/0506	224/1141	265	.3835	.0279
12	C3	224/0510	224/0547	38	.0396	.0887
12	CC3	223/2305	224/0428	224	.1243	.0139

5.9 RESIDUAL PLOTS' TAPE NO. 11895 ITEM NO. N.A.

5.10REMARKS' CONV. IN 3 ITERATIONS

TIME OF REPORT'
DAY 224 , 14 HR , 09 MIN GMT

PREPARED BY' NIELSEN (R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6236

TAPE NO. 11850
ITEM NO. N.A.
SEQ. NO. 0093
COMPUTER B

5.2 EPOCH DAY 224 , 5 ' 30 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-473.86401	KM	DX	.43438778	KM/SEC
Y	-889.23433	KM	DY	1.1253224	KM/SEC
Z	-2697.5746	KM	DZ	-.13107215	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	121.4 M	DX	.03323 M/S	X	.0000 M	DX	.0000 M/S
Y	169.4 M	DY	.01824 M/S	Y	.0000 M	DY	.0000 M/S
Z	38.13 M	DZ	.05246 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.52	KM	ECC	.277126		APF	1.11326	DEG
LAN	31.4952	DEG	INC	85.1562	DEG	TFP	-3354.95	SEC
RCA	1833.58	KM	PALT	95.4932	KM	PER	191.062	MIN
APO	3239.45	KM	AALT	1501.36	KM	TA	227.620	DEG
LAT	311.500	DEG	LONG	216.992	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.94336244E-05	C33	-.28197444E-04	C41	-.32631249E-05
C42	+.32269216E-05	C43	+.18256763E-05	C44	+.22059781E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.36593471E-05	S33	-.85856168E-05	S41	+.67981786E-05
S42	+.19013393E-05	S43	+.76306893E-06	S44	+.26596397E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 3625.4

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	CC3	224/1450	224/1829	159	.3354	.0340
41	CC3	224/0530	224/1400	336	.2425	.0380
12	C3	224/0530	224/0547	18	.0613	.0083

5.9 RESIDUAL PLOTS' TAPE NO. 11806 ITEM NO. N.A.

5.10REMARKS' GOOD OD. THE FIT IS GOOD, AND THE OD CONVERGED RAPIDLY, CONSIDERING THE AMOUNT OF READOUT AND PERILUNE DATA

TIME OF REPORT'
DAY 224 , 19 HR , 47 MIN GMT

PREPARED BY' J W UNDERWOOD (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6338 TAPE NO. 11387
ITEM NO.

5.2 EPOCH DAY 224 , 11 ' 50 ' 0.000 GMT SEQ. NO. 0094
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-532.80939	KM	DX	.42035396	KM/SEC
Y	-1032.3719	KM	DY	1.1002236	KM/SEC
Z	-2676.4597	KM	DZ	-.20124517	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	75.05 M	DX	.02511 M/S	X	.0000 M	DX	.0000 M/S
Y	96.63 M	DY	.01456 M/S	Y	.0000 M	DY	.0000 M/S
Z	27.91 M	DZ	.03038 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.44	KM	ECC	.277176		APF	1.17331	DEG
LAN	28.0117	DEG	INC	85.2482	DEG	TFP	-3486.73	SEC
RCA	1833.40	KM	PALT	95.3064	KM	PER	191.052	MIN
APO	3239.47	KM	AALT	1501.38	KM	TA	224.567	DEG
LAT	314.461	DEG	LONG	212.871	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.55650580E-05	C33	-.17548735E-04	C41	-.32631249E-05
C42	+.31244565E-05	C43	+.20332732E-05	C44	+.23696741E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.72027684E-05	S33	-.32391665E-05	S41	+.67981786E-05
S42	+.15425797E-05	S43	+.45025250E-06	S44	+.17894702E-05

5.7 DATA ARC LENGTH' 12 HRS 50 MIN SOS= 3341.8

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	224/2119	224/2231	66	.3619	.0660
62	CC3	224/1450	224/2020	227	.2858	.0484
41	CC3	224/1157	224/1400	105	.1866	.0282
12	CC3	224/2118	225/0039	129	.3182	-.0585

5.9 RESIDUAL PLOTS' TAPE NO. 11701 ITEM NO.

5.10REMARKS' FAIR OD CONVERGED IN 4 ITERATIONS
SOS IS COMPARABLE TO THAT OF PREVIOUS ODS

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 225 , 02 HR , 08 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6340 TAPE NO. 11805
ITEM NO.

5.2 EPOCH DAY 224 , 15 ' 0 ' 0.000 GMT SEQ. NO. 0095
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-560.05182	KM	DX	.41332831	KM/SEC
Y	-1103.3093	KM	DY	1.0866455	KM/SEC
Z	-2662.4771	KM	DZ	-.23515991	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	122.0 M	DX	.04356 M/S	X	.0000 M	DX	.0000 M/S
Y	146.2 M	DY	.02450 M/S	Y	.0000 M	DY	.0000 M/S
Z	34.84 M	DZ	.04178 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.56	KM	ECC	.277140		APF	1.18072	DEG
LAN	26.2738	DEG	INC	85.2529	DEG	TFP	-3552.28	SEC
RCA	1833.58	KM	PALT	95.4909	KM	PER	191.067	MIN
APO	3239.55	KM	AALT	1501.46	KM	TA	223.091	DEG
LAT	315.920	DEG	LONG	210.886	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

5.7 DATA ARC LENGTH' 12 HRS 50 MIN SOS= 2406.7

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	224/2119	224/2231	66	.3682	-.0100
62	CC3	224/1500	224/2020	197	.2266	.0134
12	CC3	224/2120	225/0349	186	.2907	.0186

5.9 RESIDUAL PLOTS' TAPE NO. 11269 ITEM NO.

5.10REMARKS' FAIR OD CONVERGENCE SLOW 10 ITERATIONS
SOME DATA REJECTED BY CHANGING REJECTION SIGMAS TO 1.
THIS ACCOUNTS FOR SOME OF THE CONVERGENCE PROBLEMS
SOS IS FAIRLY LOW COMPARED TO RECENT ODS

TIME OF REPORT' PREPARED BY' CLARK (B)
DAY 225 , 09 HR , 28 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6142 TAPE NO. 11704
ITEM NO. N.A.

5.2 EPOCH DAY 224 , 21 ' 25 ' 0.000 GMT SEQ. NO. 0097
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-484.65339	KM	DX	.43199685	KM/SEC
Y	-915.66173	KM	DY	1.1202320	KM/SEC
Z	-2695.4597	KM	DZ	-.14436918	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	194.9 M	DX	.06139 M/S	X	.0000 M	DX	.0000 M/S
Y	190.6 M	DY	.02972 M/S	Y	.0000 M	DY	.0000 M/S
Z	35.03 M	DZ	.05055 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.13	KM	ECC	.277088		APF	1.25363	DEG
LAN	22.7441	DEG	INC	85.1607	DEG	TFP	-3383.40	SEC
RCA	1833.40	KM	PALT	95.3095	KM	PER	191.018	MIN
APO	3238.86	KM	AALT	1500.77	KM	TA	226.941	DEG
LAT	312.033	DEG	LONG	208.133	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.23457712E-04	C33	-.14227636E-05	C41	-.32631249E-05
C42	+.77762509E-05	C43	+.28068278E-05	C44	+.54388744E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.36537181E-04	S33	+.20748793E-05	S41	+.67981786E-05
S42	+.33821672E-05	S43	-.10409610E-05	S44	-.92541363E-07

5.7 DATA ARC LENGTH' 12 HRS 55 MIN SOS= 2938.1

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	224/2125	224/2231	49	.4838	.0198
41	C3	225/0430	225/0549	57	.4457	-.1075
41	CC3	225/0650	225/1018	113	.3575	.0044
12	CC3	224/2125	225/0552	253	.2577	.0087

5.9 RESIDUAL PLOTS' TAPE NO. 11707 ITEM NO. N.A.

5.10 REMARKS' REMOVED 5 BAD DATA POINTS WITH START STOP TIMES

TIME OF REPORT' PREPARED BY' HAMILTON (R)
DAY 225 , 12 HR , 57 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6144 TAPE NO. 12560
ITEM NO. N.A.

5.2 EPOCH DAY 225 , 3 HR , 45 MIN , 0.000 SEC GMT SEQ. NO. 0098
COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-542.36295	KM	DX	.41760573	KM/SEC
Y	-1050.5371	KM	DY	1.0955993	KM/SEC
Z	-2675.4536	KM	DZ	-.21079860	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	143.0 M	DX	.05337 M/S	X	.0000 M	DX	.0000 M/S
Y	129.0 M	DY	.02650 M/S	Y	.0000 M	DY	.0000 M/S
Z	28.14 M	DZ	.03511 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.28	KM	ECC	.276973		APF	1.42813	DEG
LAN	19.2648	DEG	INC	85.3027	DEG	TFP	-3514.50	SEC
RCA	1833.80	KM	PALT	95.7080	KM	PER	191.034	MIN
APO	3238.76	KM	AALT	1500.67	KM	TA	223.944	DEG
LAT	314.822	DEG	LONG	204.007	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37925499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.19129715E-04	C33	-.22027994E-04	C41	-.32631249E-05
C42	+.72363825E-05	C43	+.29608320E-05	C44	+.23261398E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.21627877E-04	S33	+.13518100E-04	S41	+.67981786E-05
S42	+.14339031E-05	S43	+.65215988E-06	S44	-.17809605E-06

5.7 DATA ARC LENGTH: 12 HRS 55 MIN SOS= 1711.9

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	225/1426	225/1501	34	.2302	.0522
62	CC3	225/1506	225/1522	17	.1330	.1233
41	C3	225/0430	225/1517	83	.3264	.0117
41	CC3	225/0650	225/1503	302	.2118	.0299
12	CC3	225/0346	225/0552	96	.1850	.1022

5.9 RESIDUAL PLOTS: TAPE NO. 11624 ITEM NO. N.A.

5.10REMARKS: THIS OD BEAT TO DEATH BY L. NIELSEN

TIME OF REPORT: PREPARED BY: NIELSEN (R)
DAY 225 , 17 HR , 47 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6246

TAPE NO. 12637
ITEM NO. N.A.
SEQ. NO. 0102
COMPUTER B

5.2 EPOCH DAY 225 , 10 ' 5 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-597.13949	KM	DX	.40240966	KM/SEC
Y	-1182.5084	KM	DY	1.0687584	KM/SEC
Z	-2647.2668	KM	DZ	-.27420041	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	86.12 M	DX	.03136 M/S	X	.0000 M	DX	.0000 M/S
Y	68.57 M	DY	.01514 M/S	Y	.0000 M	DY	.0000 M/S
Z	11.86 M	DZ	.01551 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.33	KM	ECC	.276835		APF	1.60070	DEG
LAN	15.7895	DEG	INC	85.4267	DEG	TFP	-3645.40	SEC
RCA	1834.19	KM	PALT	96.0967	KM	PER	191.041	MIN
APO	3238.48	KM	AALT	1500.39	KM	TA	221.022	DEG
LAT	317.545	DEG	LONG	199.986	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.11300357E-04	C33	-.56361923E-06	C41	-.32631249E-05
C42	+.49664221E-05	C43	+.17483563E-05	C44	-.42456621E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.19311909E-04	S33	-.40706630E-05	S41	+.67981786E-05
S42	-.49948385E-06	S43	+.75562540E-06	S44	+.97600646E-06

5.7 DATA ARC LENGTH: 13 HRS 0 MIN SOS= 3599.6

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	225/1426	225/1501	35	.2408	-.1180
62	CC3	225/1506	225/2145	226	.2821	.0336
41	C3	225/1507	225/1517	9	.0861	.1232
41	CC3	225/1005	225/1503	209	.2548	.0813
12	CC3	225/2250	225/2303	11	.0632	-.7610

5.9 RESIDUAL PLOTS: TAPE NO. 12565 ITEM NO. N.A.

5.10 REMARKS: GOOD OD. CONVERGED RAPIDLY. DID NOT SOLVE FOR DOPPLER BIAS BECAUSE THERE IS NOT ENOUGH DATA FOR A GOOD SOLUTION.

TIME OF REPORT:
DAY 226 , 02 HR , 26 MIN GMT

PREPARED BY: D.S. MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6348 TAPE NO. 12573
ITEM NO.

5.2 EPOCH DAY 225 , 16 ' 30 ' 0.000 GMT SEQ. NO. 0103
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-523.36201	KM	DX	.42195789	KM/SEC
Y	-992.18725	KM	DY	1.1047280	KM/SEC
Z	-2688.9412	KM	DZ	-.18380320	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	115.9 M	DX	.03897 M/S	X	.0000 M	DX	.0000 M/S
Y	73.29 M	DY	.01645 M/S	Y	.0000 M	DY	.0000 M/S
Z	6.697 M	DZ	.01336 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.10	KM	ECC	.276742		APF	1.74202	DEG
LAN	12.2538	DEG	INC	85.3705	DEG	TFP	-3475.35	SEC
RCA	1834.26	KM	PALT	96.1687	KM	PER	191.015	MIN
APO	3237.95	KM	AALT	1499.86	KM	TA	224.846	DEG
LAT	313.609	DEG	LONG	197.130	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.28552295E-04	C33	-.15669061E-04	C41	-.32631249E-05
C42	+.29148689E-05	C43	+.36499884E-05	C44	+.14293472E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.50083543E-04	S33	+.22778564E-04	S41	+.67981786E-05
S42	-.61735094E-05	S43	-.17193873E-05	S44	-.10498073E-05

5.7 DATA ARC LENGTH' 12 HRS 50 MIN SOS= 3017.0

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	CC3	225/1630	225/2145	209	.2684	.0186
41	CC3	226/0511	226/0519	8	.0252	-.0588
12	C3	226/0519	226/0519	1	.0000	-.2393
12	CC3	225/2250	226/0408	204	.2869	.0569

5.9 RESIDUAL PLOTS' TAPE NO. 12568 ITEM NO.

5.10REMARKS' FAIR OD SOS COMPARABLE TO RECENT ODS
REDUCED REJECTION SIGMAS TO 1.5 AFTER THREE ITERATIONS
EIGHT ITERATIONS TO OSCILLATING CONVERGENCE

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 226 , 07 HR , 22 MIN GMT O.D. ANALYST

5.1 O.D. IDENTIFICATION NO. 6350 TAPE NO. 12570
ITEM NO.
5.2 EPOCH DAY 225 , 22 ' 55 ' 0.000 GMT SEQ. NO. 0105
HR MIN SEC COMPUTER B

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-446.51928	KM	DX	.43967031	KM/SEC
Y	-796.51488	KM	DY	1.1357070	KM/SEC
Z	-2714.1380	KM	DZ	-.08781319	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	147.7 M	DX	.04403 M/S	X	.0000 M	DX	.0000 M/S
Y	75.37 M	DY	.01733 M/S	Y	.0000 M	DY	.0000 M/S
Z	4.143 M	DZ	.01025 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.01	KM	ECC	.276648		APF	1.86157	DEG
LAN	8.71573	DEG	INC	85.3135	DEG	TFP	-3305.06	SEC
RCA	1834.43	KM	PALT	96.3383	KM	PER	191.004	MIN
APO	3237.59	KM	AALT	1499.50	KM	TA	228.811	DEG
LAT	309.560	DEG	LONG	194.411	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.19496599E-04	C33	-.10457143E-04	C41	-.32631249E-05
C42	+.36542715E-05	C43	+.27413309E-05	C44	+.11923586E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.45619867E-04	S33	+.15388022E-04	S41	+.67981786E-05
S42	-.14689587E-04	S43	-.24755259E-05	S44	-.84285615E-06

5.7 DATA ARC LENGTH' 12 HRS 50 MIN SOS= 2426.7

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	CC3	226/0512	226/1144	221	.2402	.0344
12	C3	226/0519	226/0659	71	.2136	-.1575
12	CC3	225/2255	226/0407	201	.2484	.0236

5.9 RESIDUAL PLOTS' TAPE NO. 12583 ITEM NO.

5.10REMARKS' FAIR OD SOS COMPARABLE TO RECENT ODS

TIME OF REPORT' PREPARED BY' VAN ZANDT (B)
DAY 226 , 13 HR , 29 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6152 — TAPE NO. 11902 — ITEM NO. N.A.

5.2 EPOCH DAY 226 , 5 ' 15 ' 0.000 GMT — SEQ. NO. 0106 — COMPUTER B
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-501.96244	KM	DX	.42731988	KM/SEC
Y	-936.29008	KM	DY	1.1132992	KM/SEC
Z	-2699.5541	KM	DZ	-.15714497	KM/SEC

5.4 STANDARD DEVIATIONS — A PRIORI

X	257.7 M	DX	.09469 M/S	X	.0000 M	DX	.0000 M/S
Y	102.9 M	DY	.03647 M/S	Y	.0000 M	DY	.0000 M/S
Z	11.10 M	DZ	.00610 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.10	KM	ECC	.276533		APF	1.92690	DEG
LAN	5.23282	DEG	INC	85.3523	DEG	TFP	-3432.83	SEC
RCA	1834.78	KM	PALT	96.6938	KM	PER	191.014	MIN
APO	3237.41	KM	AALT	1499.32	KM	TA	225.839	DEG
LAT	312.441	DEG	LONG	190.333	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.42605154E-05	C33	-.66845192E-05	C41	-.32631249E-05
C42	+.25066145E-05	C43	-.12182996E-05	C44	+.93390152E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.50504959E-05	S33	+.14312098E-04	S41	+.67981786E-05
S42	-.21235176E-04	S43	-.25062105E-06	S44	-.56061634E-06

5.7 DATA ARC LENGTH' 12 HRS 55 MIN — SOS= 2640.4

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	226/1541	226/1552	10	1.8698	.0025
62	CC3	226/1558	226/1809	53	.1919	-.1203
41	CC3	226/0515	226/1535	347	.2618	.0596
12	C3	226/1559	226/0659	69	.2885	-.0101

5.9 RESIDUAL PLOTS' TAPE NO. 11902 ITEM NO. N.A.

5.10REMARKS' EIGHT ITERATIONS-START STOP TIMES TO REMOVE TWO BAD POINTS-OCCULTATION TIMES-LOWERED REJECTION SIGMAS

TIME OF REPORT' DAY 226 , 20 HR , 26 MIN GMT — PREPARED BY' HAMILTON (R) O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6254

TAPE NO. 11804
ITEM NO. N.A.
SEQ. NO. 0107
COMPUTER B

5.2 EPOCH DAY 226 , 11 ' 40 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-424.35027	KM	DX	.44378596	KM/SEC
Y	-738.88175	KM	DY	1.1433468	KM/SEC
Z	-2719.2527	KM	DZ	-.05921967	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI		
X	171.5 M	DX .06648 M/S	X	.0000 M	DX	.0000 M/S
Y	59.77 M	DY .02420 M/S	Y	.0000 M	DY	.0000 M/S
Z	11.37 M	DZ .00290 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.04	KM	ECC	.276514		APF	1.98147	DEG
LAN	1.72818	DEG	INC	85.3282	DEG	TFP	-3259.63	SEC
RCA	1834.79	KM	PALT	96.6965	KM	PER	191.007	MIN
APO	3237.28	KM	AALT	1499.19	KM	TA	229.905	DEG
LAT	308.356	DEG	LONG	187.656	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.19892206E-04	C33	-.18034820E-05	C41	-.32631249E-05
C42	+.12855872E-05	C43	+.40455504E-05	C44	+.15183741E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.13000827E-04	S33	+.29639290E-04	S41	+.67981786E-05
S42	-.23000564E-05	S43	-.20034828E-06	S44	-.23890314E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 2163.2

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	226/1541	226/1552	6	.6868	.3678
62	CC3	226/1558	226/2228	193	.2540	.0060
41	C3	226/1559	226/1559	1	.0000	-.0038
41	CC3	226/1140	226/1535	148	.2351	.1173
12	CC3	227/0021	227/0026	6	.0296	-.3335

5.9 RESIDUAL PLOTS' TAPE NO. 12612 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGED RAPIDLY. DID NOT SOLVE FOR OCCULTATIONS BUT MADE A COUPLE OF ITERATIONS FOR THEM AT END OF THE RUN.

TIME OF REPORT'
DAY 227 , 02 HR , 26 MIN GMT

PREPARED BY' J W UNDERWOOD (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6256 TAPE NO. 11466
ITEM NO. N.A.

5.2 EPOCH DAY 226 , 14 ' 50 ' 0.000 GMT SEQ. NO. 0
HR MIN SEC COMPUTER V

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-453.00060	KM	DX	.43800465	KM/SEC
Y	-809.35862	KM	DY	1.1331953	KM/SEC
Z	-2714.4471	KM	DZ	-.09476231	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	166.3 M	DX	.04208 M/S	X	.0000 M	DX	.0000 M/S
Y	49.61 M	DY	.01602 M/S	Y	.0000 M	DY	.0000 M/S
Z	11.76 M	DZ	.00485 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.97	KM	ECC	.276509		APF	1.99358	DEG
LAN	359.980	DEG	INC	85.3534	DEG	TFP	-3322.25	SEC
RCA	1834.75	KM	PALT	96.6604	KM	PER	191.000	MIN
APO	3237.19	KM	AALT	1499.10	KM	TA	228.415	DEG
LAT	309.819	DEG	LONG	185.574	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.10768836E-04	C33	-.37449229E-05	C41	-.32631249E-05
C42	-.69791861E-05	C43	+.14189962E-05	C44	+.84348268E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.14661352E-04	S33	+.24894454E-04	S41	+.67981786E-05
S42	-.17845870E-04	S43	-.19449591E-05	S44	-.20432150E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 4024.1

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	226/1541	226/1552	6	.3796	-.0594
62	CC3	226/1558	226/2228	208	.3878	.0030
41	C3	226/1559	226/1559	1	.0000	-.1465
41	CC3	226/1450	226/1535	45	.3049	-.0787
12	CC3	227/0021	227/0349	113	.2905	.0296

5.9 RESIDUAL PLOTS' TAPE NO. 11832 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGED RAPIDLY.

TIME OF REPORT'
DAY 227 , 08 HR , 28 MIN GMT

PREPARED BY' J W UNDERWOOD (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6358 TAPE NO. 11462
ITEM NO.

5.2 EPOCH DAY 226 , 21 ' 20 ' 0.000 GMT SEQ. NO. 0109
HR MIN SEC COMPUTER V

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-233.32697	KM	DX	.47512007	KM/SEC
Y	-255.30477	KM	DY	1.1894624	KM/SEC
Z	-2692.2125	KM	DZ	.19612127	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	190.7 M	DX	.03476 M/S	X	.0000 M	DX	.0000 M/S
Y	41.87 M	DY	.01481 M/S	Y	.0000 M	DY	.0000 M/S
Z	11.39 M	DZ	.01217 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.82	KM	ECC	.276432		APF	2.00950	DEG
LAN	356.402	DEG	INC	85.3025	DEG	TFP	-2846.86	SEC
RCA	1834.84	KM	PALT	96.7465	KM	PER	190.982	MIN
APO	3236.80	KM	AALT	1498.71	KM	TA	240.253	DEG
LAT	298.102	DEG	LONG	185.254	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.13668211E-04	C33	-.53336402E-05	C41	-.32631249E-05
C42	-.70247874E-05	C43	+.21772918E-05	C44	+.87434040E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.20836389E-04	S33	+.12678859E-04	S41	+.67981786E-05
S42	-.16002339E-04	S43	-.52571288E-06	S44	-.19716298E-05

5.7 DATA ARC LENGTH' 12 HRS 40 MIN SOS= 7074.1

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	CC3	226/2120	226/2316	104	.4454	-.0001
41	CC3	227/0512	227/0959	160	.4433	.0706
12	C3	226/2316	227/0540	33	.0900	.0045
12	CC3	227/0021	227/0434	145	.3764	.1223

5.9 RESIDUAL PLOTS' TAPE NO. 11232 ITEM NO.

5.10REMARKS' SOLUTION DELAYED BY ATTEMPT TO CHANGE ESTIMATE L
IST TO INCLUDE DOPPLER BIAS

TIME OF REPORT' PREPARED BY' BUNCE (B)
DAY 227 , 12 HR , 49 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6360 TAPE NO. 11945
ITEM NO.

5.2 EPOCH DAY 227 , 3 ' 35 ' 0.000 GMT SEQ. NO. 0111
HR MIN. SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-422.95615	KM	DX	.44474075	KM/SEC
Y	-750.53448	KM	DY	1.1412160	KM/SEC
Z	-2719.2104	KM	DZ	-.06441221	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	267.1 M	DX	.06935 M/S	X	.0000 M	DX	.0000 M/S
Y	28.21 M	DY	.02630 M/S	Y	.0000 M	DY	.0000 M/S
Z	32.03 M	DZ	.02739 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2536.03	KM	ECC	.276350		APF	2.01390	DEG
LAN	352.964	DEG	INC	85.1668	DEG	TFP	-3269.67	SEC
RCA	1835.20	KM	PALT	97.1076	KM	PER	191.006	MIN
APO	3236.86	KM	AALT	1498.77	KM	TA	229.679	DEG
LAT	308.565	DEG	LONG	179.052	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.15216076E-04	C33	-.26865157E-05	C41	-.32631249E-05
C42	-.90504215E-05	C43	+.25707113E-05	C44	+.70023749E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.23748896E-04	S33	+.19391914E-04	S41	+.67981786E-05
S42	-.17996412E-04	S43	-.43215022E-06	S44	-.25774183E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4614.4

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	CC3	227/0512	227/1619	398	.3233	.0647
12	C3	227/0502	227/0540	32	.2301	.0252
12	CC3	227/0335	227/0434	42	.3092	.0751

5.9 RESIDUAL PLOTS' TAPE NO. 11743 ITEM NO.

5.10REMARKS' GOOD OD FIT COMPARES WELL WITH OTHERS

TIME OF REPORT' PREPARED BY' CLARK (b)
DAY 227 , 18 HR , 12 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6162

TAPE NO. 11623
ITEM NO. N.A.
SEQ. NO. 0112
COMPUTER W

5.2 EPOCH DAY 227 , 10 HR , 0 MIN , 0.000 SEC GMT

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-340.85265	KM	DX	.45957222	KM/SEC
Y	-543.93953	KM	DY	1.1662796	KM/SEC
Z	-2721.6529	KM	DZ	.04152123	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	144.1 M	DX	.03559 M/S	X	.0000 M	DX	.0000 M/S
Y	6.938 M	DY	.01391 M/S	Y	.0000 M	DY	.0000 M/S
Z	18.61 M	DZ	.02106 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.86	KM	ECC	.276206		APF	2.05424	DEG
LAN	349.449	DEG	INC	85.1464	DEG	TFP	-3092.11	SEC
RCA	1835.44	KM	PALT	97.3472	KM	PER	190.987	MIN
APO	3236.27	KM	AALT	1498.18	KM	TA	234.005	DEG
LAT	304.245	DEG	LONG	176.615	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.18990691E-04	C33	+.19260264E-05	C41	-.32631249E-05
C42	-.68258493E-05	C43	+.31394899E-05	C44	-.19561304E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.31852600E-04	S33	+.15105789E-04	S41	+.67981766E-05
S42	-.13562678E-04	S43	-.19645241E-05	S44	-.21396383E-05

5.7 DATA ARC LENGTH: 12 HRS 40 MIN SOS= 4566.6

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	227/1652	227/1657	6	.1884	-.6844
62	CC3	227/1702	227/2239	169	.2559	.0804
41	C3	227/1703	227/1709	7	.3217	.3502
41	CC3	227/1000	227/1658	273	.3590	.1073

5.9 RESIDUAL PLOTS: TAPE NO. 11928 ITEM NO. N.A.

5.10 REMARKS: SOS COMPARABLE TO EARLIER ODS

TIME OF REPORT:
DAY 228 , 00 HR , 35 MIN GMT

PREPARED BY: HAMILTON/NIELSEN(R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6264

TAPE NO. 11901
ITEM NO. N.A.
SEQ. NO. 0113
COMPUTER W

5.2 EPOCH DAY 227 , 16 ' 20 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-400.42550	KM	DX	.44826309	KM/SEC
Y	-682.41576	KM	DY	1.1505944	KM/SEC
Z	-2721.8827	KM	DZ	-.03107931	KM/SEC

5.4 STANDARD DEVIATIONS

					A PRIORI				
X	157.9	M	DX	.04137	M/S	X	.0000	M	DX .0000 M/S
Y	8.173	M	DY	.01541	M/S	Y	.0000	M	DY .0000 M/S
Z	23.45	M	DZ	.02650	M/S	Z	.0000	M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.75	KM	ECC	.276025		APF	2.05618	DEG
LAN	345.996	DEG	INC	85.2877	DEG	TFP	-3213.81	SEC
RCA	1835.82	KM	PALT	97.7286	KM	PER	190.975	MIN
APO	3235.68	KM	AALT	1497.59	KM	TA	231.036	DEG
LAT	307.165	DEG	LONG	172.239	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.15017585E-04	C33	+.21619338E-04	C41	-.32631249E-05
C42	-.45979537E-05	C43	+.17837382E-05	C44	-.23715901E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.18142191E-04	S33	+.23987706E-04	S41	+.67981786E-05
S42	-.97633402E-05	S43	-.11885580E-05	S44	-.20059782E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 1359.6

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	227/1652	228/0044	6	.0668	-.2002
62	CC3	227/1702	228/0036	271	.2069	.0633
41	C3	227/1703	227/1709	7	.3767	.1946
41	CC3	227/1620	227/1658	35	.1540	.0508
12	CC3	228/0042	228/0503	150	.1625	-.0017

5.9 RESIDUAL PLOTS' TAPE NO. 11959 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGED ON ITERATION 4.

TIME OF REPORT'
DAY 228 , 06 HR , 38 MIN GMT

PREPARED BY' MCKELLAR (W)
O.D. ANALYST

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6266 ITEM NO. _____ TAPE NO. _____

5.2 EPOCH: DAY 15, 22 (hr) : 40 (min) : 0 (sec) (GMT)

5.3 STATE VECTOR (SELC. 1950.0):

X	-453.10815 km	$\dot{X}$	.43711333 km/sec
Y	-817.19064 km	$\dot{Y}$	1.1317649 km/sec
Z	-2714.5817 km	$\dot{Z}$	-.0993321040 km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	101 m	$\dot{X}$	.03 m/s	X	/ m	$\dot{X}$	/ m/sec
Y	16 m	$\dot{Y}$	.01 m/s	Y	/ m	$\dot{Y}$	/ m/sec
Z	21 m	$\dot{Z}$	.02 m/s	Z	/ m	$\dot{Z}$	/ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2535.5490 km	e	.27580512	ω	2.1200926 deg.
Ω	342.53127 deg	i	85.307122 deg	Tp	-3334.9286 sec
r_p	1836.2316 km	h_p	98.141570 km	P	190.95203 min
r_a	3234.8663 km	h_a	1496.7763 km	Tan	228.15541 deg

5.6 LUNAR HARMONICS USED: 7/28 B (MOD.) LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 12 hrs 55 min. SOS = 7464

DATA STATISTICS — STATION 11 — ITERATION 1

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
[illegible]/22	[illegible]	[illegible]	[illegible]	16 6	[illegible]	[illegible]	[illegible]	.216 [illegible]

DATA STATISTICS — STATION 12 — ITERATION 1

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
14/22	C3	[illegible]	[illegible]	1	[illegible]	.371 [illegible]	-.371 [illegible]	.138 [illegible]
	CC3	[illegible]	[illegible]	19 2	[illegible]	.332 [illegible]	.111 [illegible]	.119 [illegible]

DATA STATISTICS — STATION 12 — ITERATION 1

PASS	DATA TYPE	BEGINNING TIME	END TIME	NUMBER OF POINTS	STD DEV	RMS	FIRST MOMENT	SECOND MOMENT
14/22	C3	[illegible]	8/16-[illegible]517	3 4	.194 [illegible]	.116 [illegible]	.514-[illegible]	.135-[illegible]
	CC3	8/16-[illegible]	8/16-[illegible]	25 4	.353 [illegible]	.357 [illegible]	-.481-[illegible]	.127 [illegible]

5.10 REMARKS: COMPUTER STRING (W) BROKE DOWN. FINISHED ON X STRING UNDER SEVERE TIME CONSTRAINT. ORBITAL ELEMENTS SEEM TO INDICATE A FAIRLY GOOD OD

TIME OF REPORT: Prepared by: VAN ZANDT R W (B)

DAY , hr min GMT O.D. Analyst

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6368 ITEM NO. _____ TAPE NO. _____

5.2 EPOCH: DAY 228, 05 : 05 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-377.68716	km	$\dot{X}$	0.45130196	km/sec
Y	-607.73763	km	$\dot{Y}$	1.1599597	km/sec
Z	-2722.6461	km	$\dot{Z}$	0.005334863	km/sec

5.4 STANDARD DEVIATIONS:

X	134.14	m	$\dot{X}$	.03641	m/s	X		m	$\dot{X}$		m/sec
Y	[illegible]	m	$\dot{Y}$	.01278	m/s	Y		m	$\dot{Y}$		m/sec
Z	22.94	m	$\dot{Z}$	.03114	m/s	Z		m	$\dot{Z}$		m/sec

A PRIORI

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2535.1402	km	e	0.27552291		ω	2.1428782	deg.
Ω	337.03894	deg	i	85.468406	deg	Tp	-3155.1979	sec
r_p	1836.6358	km	h_p	98.545791	km	P	190.70585	min
r_a	3233.6446	km	h_a	1495.5546	km	Tan	232.47721	deg

5.6 LUNAR HARMONICS USED: LRC 7/28L LAT: _____ LONG: _____

5.7 DATA ARC, LENGTH: 12 hrs 45 min. SOS=

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
41	CC3	228/0802	228/1744	475	0.343	.0844
12	CC3	228/0506	228/0720	115	0.445	.085

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: _____

TIME OF REPORT: Prepared by: W.L. Prince R W (B)
DAY 228, 22 hr 09 min GMT O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6170 TAPE NO. 11941
ITEM NO. N.A.

5.2 EPOCH DAY 228 , 11 ' 30 ' 0.000 GMT SEQ. NO. 0119
HR MIN SEC COMPUTER G

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-288.51168	KM	DX	.46634077	KM/SEC
Y	-390.67749	KM	DY	1.1799821	KM/SEC
Z	-2712.6942	KM	DZ	.11978006	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	101.7 M	DX	.02181 M/S	X	.0000 M	DX	.0000 M/S
Y	26.09 M	DY	.01071 M/S	Y	.0000 M	DY	.0000 M/S
Z	16.46 M	DZ	.02815 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.21	KM	ECC	.275209		APF	2.26077	DEG
LAN	335.490	DEG	INC	85.3576	DEG	TFP	-2974.25	SEC
RCA	1837.50	KM	PALT	99.4085	KM	PER	190.914	MIN
APO	3232.92	KM	AALT	1494.83	KM	TA	237.039	DEG
LAT	301.015	DEG	LONG	163.252	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.10279521E-04	C33	+.82068692E-05	C41	-.32631249E-05
C42	+.45026758E-06	C43	-.30007250E-06	C44	-.14426173E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.20975907E-05	S33	-.11681090E-05	S41	+.67981786E-05
S42	-.55744950E-06	S43	+.25819090E-06	S44	+.46495951E-06

5.7 DATA ARC LENGTH: 12 HRS 40 MIN SOS= 2653.1

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	228/1750	228/1757	6	.0303	-.1652
62	CC3	228/1803	229/0005	266	.1959	.0365
41	C3	228/1803	228/1808	6	.0403	-.0522
41	CC3	228/1130	228/1758	319	.2363	.0636

5.9 RESIDUAL PLOTS: TAPE NO. 12627 ITEM NO. N.A.

5.10REMARKS: SOS COMPARABLE TO EARLIER ODS

TIME OF REPORT: PREPARED BY: HAMILTON/NIELSEN(R)
DAY 229 , 02 HR , 52 MIN GMT O.D. ANALYST

DESC-+PT+ON

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6172

TAPE NO. 11238
ITEM NO. N.A.
SEQ. NO. 0122
COMPUTER W

5.2 EPOCH DAY 228 , 17 ' 55 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-193.35913	KM	DX	.47852079	KM/SEC
Y	-168.58075	KM	DY	1.1911323	KM/SEC
Z	-2681.0424	KM	DZ	.24271892	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	148.1 M	DX	.02664 M/S	X	.0000 M	DX	.0000 M/S
Y	47.54 M	DY	.01807 M/S	Y	.0000 M	DY	.0000 M/S
Z	14.45 M	DZ	.04605 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.07	KM	ECC	.274968		APF	2.45182	DEG
LAN	331.929	DEG	INC	85.1873	DEG	TFP	-2792.73	SEC
RCA	1638.01	KM	PALT	99.9191	KM	PER	190.898	MIN
APO	3232.13	KM	AALT	1494.04	KM	TA	241.806	DEG
LAT	296.158	DEG	LONG	161.799	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.92257337E-05	C33	+.24345108E-04	C41	-.32631249E-05
C42	+.14011305E-05	C43	-.58110480E-06	C44	-.11149078E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.11627626E-05	S33	-.72169679E-05	S41	+.67981786E-05
S42	-.43694792E-06	S43	+.15129893E-06	S44	+.20680479E-05

5.7 DATA ARC LENGTH' 12 HRS 40 MIN SOS= 2445.7

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	228/1757	229/0146	23	.2441	.0135
62	CC3	228/1803	229/0059	294	.2578	.0154
41	C3	228/1803	228/1808	6	.0603	-.1500
41	CC3	228/1755	228/1758	4	.0208	-.1496
12	C3	229/0053	229/0059	5	.0638	-.1889
12	CC3	229/0119	229/0632	245	.1902	-.0716

5.9 RESIDUAL PLOTS' TAPE NO. 11872 ITEM NO. N.A.

5.10 REMARKS' SOS COMPARABLE TO EARLIER ODS

TIME OF REPORT'
DAY 229 , 09 HR , 32 MIN GMT

PREPARED BY' HAMILTON/NIELSEN(R)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6274

TAPE NO. 11476
ITEM NO. N.A.
SEQ. NO. 0124
COMPUTER W

5.2 EPOCH DAY 228 , 21 ' 0 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-363.33460	KM	DX	.45474255	KM/SEC
Y	-590.65350	KM	DY	1.1596066	KM/SEC
Z	-2726.3041	KM	DZ	.01420618	KM/SEC

5.4 STANDARD DEVIATIONS

				A PRIORI			
X	126.4 M	DX	.03674 M/S	X	.0000 M	DX	.0000 M/S
Y	52.37 M	DY	.01250 M/S	Y	.0000 M	DY	.0000 M/S
Z	26.69 M	DZ	.04168 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.16	KM	ECC	.274940		APF	2.44641	DEG
LAN	330.241	DEG	INC	85.2459	DEG	TFP	-3151.76	SEC
RCA	1838.14	KM	PALT	100.053	KM	PER	190.908	MIN
APO	3232.17	KM	AALT	1494.08	KM	TA	232.616	DEG
LAT	305.219	DEG	LONG	157.007	DEG			

5.6 LUNAR HARMONICS USED' ~~[illegible]~~ FOULED UP

RE	6378.15033	KE	398601.277	KM	4902.58008
J20	+.20700000E-03	J30	-.44599999E-04	J40	-.20900000E-04
C21	+.87999999E-05	C22	+.27600000E-04	C31	+.43499999E-04
C32	+.34325821E-04	C33	+.29853842E-04	C41	-.50999999E-05
C42	-.69654626E-05	C43	-.29009943E-06	C44	-.11505132E-05
S21	-.41099999E-04	S22	-.57999999E-05	S31	+.17000000E-04
S32	+.26500414E-04	S33	-.13311137E-04	S41	-.10200000E-04
S42	+.36478514E-05	S43	-.13918233E-05	S44	+.23344770E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 2287.7

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	229/0120	229/0146	22	.1245	-.2561
62	CC3	228/2103	229/0059	171	.2310	.0552
41	C3	229/0832	229/0934	63	.0958	.2089
41	CC3	229/0943	229/0948	6	.0517	.1324
12	C3	229/0053	229/0949	12	.0732	-.0380
12	CC3	229/0119	229/0939	412	.2035	.0161

5.9 RESIDUAL PLOTS' TAPE NO. 12556 ITEM NO. N.A.

5.10 REMARKS' BAD ~~GOOD~~ OD. CONVERGED IN 7 ITERATIONS. WRONG HARMONICS, ALL OF REPEATED

TIME OF REPORT'
DAY 229 , 13 HR , 45 MIN GMT

PREPARED BY' MCKELLAR (W)
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6274 (REDO) ITEM NO. _____ TAPE NO. _____

5.2 EPOCH: DAY 228, 21 : 00 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-362.1718 km	$\dot{X}$	0.45505701 km/sec
Y	-[illegible]0.27578 km	$\dot{Y}$	1.1594919 km/sec
Z	-2726.543 km	$\dot{Z}$	0.014564446 km/sec

5.4 STANDARD DEVIATIONS:

				A PRIORI			
X	[illegible] m	$\dot{X}$	0.04085 m/s	X	/ m	$\dot{X}$	/ m/sec
Y	[illegible] m	$\dot{Y}$	0.01357 m/s	Y	/ m	$\dot{Y}$	/ m/sec
Z	[illegible] m	$\dot{Z}$	[illegible] m/s	Z	/ m	$\dot{Z}$	/ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	[illegible].2010 km	e	0.27494[illegible]	ω	[illegible] deg.		
Ω	330.23527 deg	i	85.218605 deg	T_p	[illegible] sec		
r_p	1832.1578 km	h_p	100.06776 km	P	190.91272 min		
r_a	3232.2442 km	h_a	1494.1542 km	Tan	232.61972 deg		

5.6 LUNAR HARMONICS USED: LRC 7/[illegible] MOD LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 12 hrs 45 min. SOS = 14416

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	[illegible]	228/0120	228/0146	22	.121	-.170
	[illegible]	228/2103	229/0100	171	.188	.0265
41	C3	229/[illegible]	229/0134	63	.138	.148
	[illegible]	229/0943	229/0945	2	.00635	.139
12	C3	229/0053	229/0945	7	.0784	-.0122
	[illegible]	228/0119	[illegible]	407	.160	.0245

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: Good OD, once harmonics [illegible] to SFACEL. Rerun of the inflight 6274 to correct error.

TIME OF REPORT: Prepared by: W. L. Pence RWB
DAY [illegible], 16 hr 04 min GMT O.D. Analyst

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6276 TAPE NO. 12536
ITEM NO. N.A.

5.2 EPOCH DAY 229 , 3 ' 25 ' 0.000 GMT SEQ. NO. 0125
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-275.68678	KM	DX	.46899750	KM/SEC
Y	-373.36884	KM	DY	1.1791471	KM/SEC
Z	-2714.2261	KM	DZ	.12907350	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	87.98 M	DX	.01997 M/S	X	.0000 M	DX	.0000 M/S
Y	40.15 M	DY	.01066 M/S	Y	.0000 M	DY	.0000 M/S
Z	15.66 M	DZ	.03173 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.18	KM	ECC	.274785		APF	2.53702	DEG
LAN	326.689	DEG	INC	85.1855	DEG	TFP	-2969.43	SEC
RCA	1838.55	KM	PALT	100.465	KM	PER	190.911	MIN
APO	3231.81	KM	AALT	1493.72	KM	TA	237.202	DEG
LAT	300.605	DEG	LONG	154.875	DEG			

5.6 LUNAR HARMONICS USED' ~~LRC 7/28B MODIFIED~~ ~~II/II~~ FOULED UP

RE	6378.15033	KE	398601.277	KM	4902.58008
J20	+.20700000E-03	J30	-.44599999E-04	J40	-.20900000E-04
C21	+.87999999E-05	C22	+.27600000E-04	C31	+.43499999E-04
C32	+.23096381E-04	C33	+.34434877E-04	C41	-.50999999E-05
C42	-.10925618E-04	C43	-.50957168E-06	C44	-.16683287E-05
S21	-.41099999E-04	S22	-.57999999E-05	S31	+.17000000E-04
S32	+.16772277E-04	S33	-.74301676E-05	S41	-.10200000E-04
S42	-.29993960E-06	S43	-.68097905E-06	S44	+.23170491E-05

5.7 DATA ARC LENGTH' 13 HRS 0 MIN SOS= 4299.7

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	C3	229/0832	229/0934	63	.1043	-.0281
41	CC3	229/0943	229/1611	374	.2890	.0422
12	C3	229/0943	229/0949	7	.0053	.0811
12	CC3	229/0328	229/0939	304	.2079	-.0162

5.9 RESIDUAL PLOTS' TAPE NO. 11466 ITEM NO. N.A.

5.10REMARKS' GOOD OD. CONVERGED RAPIDLY.

TIME OF REPORT' PREPARED BY' J W UNDERWOOD
DAY 229 , 18 HR , 11 MIN GMT O.D. ANALYST

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6276- REDO TAPE NO. 11468
ITEM NO.

5.2 EPOCH DAY 229 , 03, 25, 0.000 GMT SEQ. NO. 141
HR MIN SEC COMPUTER Y

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-276.21979 KM	DX	.46882868	KM/SEC
Y	-373.73126 KM	DY	1.1792556	KM/SEC
Z	-2714.0359 KM	DZ	.12878592	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	89.62 M	DX	.02627 M/S	X	.0000 M	DX	.0000 M/S
Y	40.92 M	DY	.01080 M/S	Y	.0000 M	DY	.0000 M/S
Z	16.05 M	DZ	.01654 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE)

SMA	2535.07	KM	ECC	.274759		APF	2.52795	DEG
LAN	326.695	DEG	INC	85.1980	DEG	TFP	-2969.5	SEC
RCA	1838.54	KM	PALT	100.447	KM	PER	190.898	MIN
APO	3231.60	KM	AALT	1493.51	KM	TA	237.199	DEG

5.6 LUNAR HARMONICS USED LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.20706709E-04	C33	+.36775642E-04	C41	-.32631249E-05
C42	-.43975006E-05	C43	-.15588435E-05	C44	-.13208547E-05
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.81703538E-05	S33	-.11913455E-04	S41	+.67981786E-05
S42	-.30139943E-05	S43	+.12894193E-05	S44	+.27401122E-05

5.7 DATA ARC LENGTH 12 HRS 45 MIN SOS= 1613.5

5.8 DATA SUMMARY

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
41	C3	229/0832	229/0934	63	.1190	.0396
41	CC3	229/0943	229/1609	362	.1540	.0512
12	C3	229/0943	229/0949	7	.0290	-.1770
12	CC3	229/0328	229/0939	298	.1590	-.0266

5.9 RESIDUAL PLOTS TAPE NO. 11727 ITEM NO.

5.10 REMARKS

TIME OF REPORT PREPARED BY BUNCE (B)
DAY 233 , 20 HR , 00 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6378 TAPE NO. 11195
ITEM NO.

5.2 EPOCH DAY 229 , 6 ' 35 ' 0.000 GMT SEQ. NO. 0126
HR MIN SEC COMPUTER W

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-300.86528	KM	DX	.46561069	KM/SEC
Y	-440.39515	KM	DY	1.1733999	KM/SEC
Z	-2720.9697	KM	DZ	.09314412	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	107.6 M	DX	.02650 M/S	X	107.6 M	DX	.0265 M/S
Y	54.10 M	DY	.01148 M/S	Y	54.10 M	DY	.0115 M/S
Z	18.01 M	DZ	.03891 M/S	Z	18.01 M	DZ	.0389 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.05	KM	ECC	.274709		APF	2.58267	DEG
LAN	324.938	DEG	INC	85.1455	DEG	TFP	-3027.72	SEC
RCA	1838.65	KM	PALT	100.557	KM	PER	190.895	MIN
APO	3231.44	KM	AALT	1493.35	KM	TA	235.721	DEG
LAT	302.028	DEG	LONG	152.741	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.29595951E-04	C33	+.33913158E-04	C41	-.32631249E-05
C42	-.43519998E-05	C43	-.22025645E-05	C44	-.91170388E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.11018284E-04	S33	-.13801141E-04	S41	+.67981786E-05
S42	-.27159369E-05	S43	+.12225648E-05	S44	+.25726329E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4012.8

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	229/1836	229/1837	2	.0082	.0495
62	CC3	229/1845	229/1919	27	.1993	.5448
41	C3	229/0832	229/1904	85	.2470	.0624
41	CC3	229/0943	229/1839	515	.2368	.0530
12	C3	229/0943	229/0949	7	.0451	-.1532
12	CC3	229/0637	229/0939	167	.1777	.0728

5.9 RESIDUAL PLOTS' TAPE NO. 12565 ITEM NO.

5.10REMARKS' GOOD OD CONVERGED RAPIDLY

TIME OF REPORT' PREPARED BY' BUNCE
DAY 229 , 20 HR , 50 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6380 TAPE NO. 11935
ITEM NO.

5.2 EPOCH DAY 229 , 13 ' 0 ' 0.000 GMT SEQ. NO. 0129
HR MIN SEC COMPUTER G

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-211.34035	KM	DX	.47782549	KM/SEC
Y	-220.87790	KM	DY	1.1877250	KM/SEC
Z	-2692.7213	KM	DZ	.21293170	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	102.1 M	DX	.01949 M/S	X	.0000 M	DX	.0000 M/S
Y	57.05 M	DY	.01385 M/S	Y	.0000 M	DY	.0000 M/S
Z	14.84 M	DZ	.04296 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.25	KM	ECC	.274487		APF	2.57748	DEG
LAN	321.386	DEG	INC	85.0899	DEG	TFP	-2842.22	SEC
RCA	1839.35	KM	PALT	101.265	KM	PER	190.918	MIN
APO	3231.14	KM	AALT	1493.05	KM	TA	240.545	DEG
LAT	297.289	DEG	LONG	150.972	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.30077546E-04	C33	+.32877987E-05	C41	-.32631249E-05
C42	-.56252857E-05	C43	+.18310819E-05	C44	-.69556845E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.92761315E-05	S33	+.84472506E-05	S41	+.67981786E-05
S42	-.39482152E-05	S43	-.43056773E-06	S44	-.95755249E-07

5.7 DATA ARC LENGTH: 12 HRS 45 MIN SOS= 3398.5

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	229/1836	229/1837	2	.0034	-.0796
62	CC3	229/1845	230/0144	312	.2995	.0222
41	C3	229/1843	229/1904	21	.0832	.1395
41	CC3	229/1300	229/1839	316	.1844	.0401
12	C3	230/0138	230/0144	3	.0640	-.2487

5.9 RESIDUAL PLOTS: TAPE NO. 11774 ITEM NO.

5.10REMARKS: GOOD OD CONVERGED RAPIDLY

TIME OF REPORT: PREPARED BY: BUNCE (G)
DAY 230 , 03 HR , 44 MIN GMT O.D. ANALYST

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6182 ITEM NO. 650 A

TAPE NO. 11957

5.2 EPOCH: DAY 229, 16 : 10 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-241.95582	km	$\dot{X}$	0.47419468	km/sec
Y	-291.13418	km	$\dot{Y}$	1.1845914	km/sec
Z	-2703.2172	km	$\dot{Z}$	0.17373432	km/sec

5.4 STANDARD DEVIATIONS:

					A PRIORI				
X	97.62	m	$\dot{X}$	.01838	m/s	X	/	m	$\dot{X}$ / m/sec
Y	58.68	m	$\dot{Y}$	.01349	m/s	Y	/	m	$\dot{Y}$ / m/sec
Z	18.76	m	$\dot{Z}$	.04170	m/s	Z	/	m	$\dot{Z}$ / m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2535.12	km	e	0.274522		ω	2.51024	deg.
Ω	319.658	deg	i	85.1507	deg	Tp	-2899.34	sec
r_p	1839.17	km	h_p	101.081	km	P	190.903	min
r_a	3231.06	km	h_a	1492.97	km	Tan	239.036	deg

5.6 LUNAR HARMONICS USED: LRC 7/28B MOD. LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 12 hrs 45 min. SOS = 1722.3

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	229/1836	230/0211	10	.136	-.0626
	CC3	229/1845	230/0159	320	.185	.0513
41	C3	229/1844	229/1904	21	.0910	-.00123
	CC3	229/1610	229/1839	140	.157	-.0723
12	C3	230/0142	230/0155	12	.131	.0412
	CC3	230/0203	230/0455	157	.188	-.0893

5.9 RESIDUAL PLOTS: TAPE NO. 11945 ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: GOOD OD. CONVERGED RAPIDLY.

TIME OF REPORT:
DAY 230, 06 hr 19 min GMT

Prepared by: HAMILTON/NIELSEN (R) W B
O.D. Analyst

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6184 ITEM NO. 663-4C

TAPE NO. 12573

5.2 EPOCH: DAY 229, 22 : 30 : 0.0 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-283.60099 km	$\dot{X}$	.46392316 km/sec
Y	-424.93781 km	$\dot{Y}$	1.1761102 km/sec
Z	-2720.0349 km	$\dot{Z}$	.10322229 km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	93.7 m	$\dot{X}$	.024 m/s	X	↓ m	$\dot{X}$	↓ m/sec
Y	69.6 m	$\dot{Y}$	.019 m/s	Y	↓ m	$\dot{Y}$	↓ m/sec
Z	[illegible] m	$\dot{Z}$	.044 m/s	Z	↓ m	$\dot{Z}$	↓ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	[illegible] km	e	.27446	ω	2.56 deg.
Ω	316.13 deg	i	85.01 deg	Tp	-3012.7 sec
r_p	[illegible] km	h_p	101.37 km	P	190.92 min
r_a	3231.14 km	h_a	1493.05 km	Tan	236.13 deg

5.6 LUNAR HARMONICS USED: 7/28C MOD LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 12 hrs 45 min. SOS=2133

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	230:0204	02:11	8	[illegible]	[illegible]
62	CC3	229:2230	230:01:58	175	.146	.142
41	C3	230:0042	[illegible]	.19	.191	[illegible]
41	CC3	0913	11:14	121	.145	[illegible]
[illegible]	C3	0142	10:59			
[illegible]	CC3	0203	09:07			

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: GOOD OD

TIME OF REPORT:
DAY 230, 14 hr 50 min GMT

Prepared by: [signature] (R) W B
O.D. Analyst
FOR PB HUNTRESS

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6286 ITEM NO. _____ TAPE NO. _____

5.2 EPOCH: DAY 230, 01 : 45 : 00 (GMT)
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	-173.84156	km	$\dot{X}$	0.48251767	km/sec
Y	-136.91472	km	$\dot{Y}$	1.1907118	km/sec
Z	-2675.3051	km	$\dot{Z}$	0.26089028	km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	10.96	m	$\dot{X}$	.0172	m/s	X		m	$\dot{X}$ m/sec
Y	62.34	m	$\dot{Y}$	.0155	m/s	Y		m	$\dot{Y}$ m/sec
Z	12.89	m	$\dot{Z}$	.0463	m/s	Z		m	$\dot{Z}$ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2535.0642	km	e	0.27441923		ω	2.5503244	deg.
Ω	314.3814	deg	i	84.995270	deg	Tp	-2769.3784	sec
r_p	1839.3938	km	h_p	101.30385	km	P	190.89727	min
r_a	3230.7345	km	h_a	1492.6445	km	Tan	242.48865	deg

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 12 hrs 45 min. SOS = 2366.

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	8/18-020432	021132	8	.0837	-.384
	CC3	8/18-014547	015832	11	.171	.0475
41	C3	8/18-084232	090332	19	.187	-.176
	CC3	8/18-091342	143502	292	.144	.0548
12	C3	8/18-014602	105932	108	.105	.0334
	CC3	8/18-020332	090732	364	.225	.0589

5.9 RESIDUAL PLOTS: TAPE NO. _____ ITEM NO. _____

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: CONVERGED QUICKLY - 3 ITERATIONS.
MAPPED TO V-49 (P.F.) AND V-51 (CRASH UPDATE)

TIME OF REPORT:
DAY 230, 18 hr 00 min GMT

Prepared by: D. L. McKellar RWB
O.D. Analyst

i. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6290 Rerun ITEM NO. 116

TAPE NO. 1255 (GMT)

5.2 EPOCH: DAY 230, 11 hr : 40 min : 00 sec

5.3 STATE VECTOR (SELC. 1950.0):

X	452.23031	km	$\dot{X}$	.39909770	km/sec
Y	1324.9764	km	$\dot{Y}$	.86349951	km/sec
Z	-1661.0695	km	$\dot{Z}$	1.29408 03	km/sec

5.4 STANDARD DEVIATIONS:

X	75.89	m	$\dot{X}$	.0235	m/s	A PRIORI X		m	$\dot{X}$ m/sec
Y	38.02	m	$\dot{Y}$	.0394	m/s	Y		m	$\dot{Y}$ m/sec
Z	56.82	m	$\dot{Z}$	.0372	m/s	Z		m	$\dot{Z}$ m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2534.934	km	e	.27425686		ω	2.4304716	deg.
Ω	308.87614	deg	i	84.938601	deg	Tp	-1436.6928	sec
r_p	1839.7116	km	h_p	101.62158	km	P	190.88266	min
r_a	3230.1581	km	h_a	1492.0681	km	Tan	286.76833	deg

5.6 LUNAR HARMONICS USED: 7/28B MOD LAT: _____ LONG: _____

5.7 DATA ARC, LENGTH: 13 hrs 00 min. SOS=

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	8/18 1912	8/18 1920	3	.00639	.0518
62	CC3	8/18 1924	8/19 0040	257	.218	.0397
41	CC3	8/18 1141	8/18 1919	438	.224	.0453

5.9 RESIDUAL PLOTS: TAPE NO. 11909 ITEM NO. 116

ATTACHED DISPLAYED AT CONF. NOT AVAILABLE

5.10 REMARKS: GOOD OD. GOOD DATA ARC, SMOOTH PLOT, DUE TO RESOLVER CORRECTIONS.

TIME OF REPORT: DAY 234, 10 hr 20 min GMT

Prepared by: J W Underwood R W B
O.D. Analyst

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6092

TAPE NO. N/A
ITEM NO. N/A
SEQ. NO. N/A
COMPUTER A

5.2 EPOCH DAY 233 , 10 , 55 , 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-817.4029	KM	DX	-.3775410	KM/SEC
Y	-2191.192	KM	DY	-.8548386	KM/SEC
Z	1507.5672	KM	DZ	-.8465959	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	41.91 M	DX	.00919 M/S	X	.0000 M	DX	.0000 M/S
Y	83.91 M	DY	.04040 M/S	Y	.0000 M	DY	.0000 M/S
Z	85.92 M	DZ	.03947 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE)

SMA	2535.11	KM	ECC	.274739		APF	1.29352	DEG
LAN	269.595	DEG	INC	84.7118	DEG	TFP	3057.27	SEC
RCA	1838.62	KM	PALT	100.525	KM	PER	190.902	MIN
APO	3231.60	KM	AALT	1493.51	KM	TA	125.02	DEG

5.6 LUNAR HARMONICS USED LRC 7/28B MODIFIED

5.7 DATA ARC LENGTH 12 HRS 00 MIN SOS= 3961

5.8 DATA SUMMARY

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
12	C3	233/1.255	233/1403			
12	C3	233/1255	233/1403	60	.366	.367
12	CC3	233/1101	233/1249	71	.113	.113
41	C3	233/1159	233/2209	53	.126	.195
41	CC3	233/1253	233/2158	545	.249	.267
62	C3	233/2132	233/2156	18	.0537	.342
62	CC3	233/2203	233/2254	38	.247	.249

5.9 RESIDUAL PLOTS TAPE NO. N.A. ITEM NO. N.A.

5.10 REMARKS

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.58299442E-05	C33	+.10768794E-04	C41	-.32631249E-05
C42	-.19788691E-05	C43	-.12970711E-05	C44	-.14542352E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.80223023E-05	S33	-.35266808E-06	S41	+.67981786E-05
S42	-.76917189E-05	S43	-.35874349E-05	S44	+.20805029E-06
RE	6378.14948	KE	398601.277	KM	4902.58002

TIME OF REPORT
DAY 234 , 00 HT , 00 MIN GMT

PREPARED BY BRUCE O'BRIEN (G)
O.D. ANALYST

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6094

TAPE NO. N.A.
ITEM NO. N.A.
SEQ. NO. N.A.
COMPUTER X

5.2 EPOCH DAY 235 , 12 , 30 , 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	308.34738	KM	DX	.46496625	KM/SEC
Y	995.93717	KM	DY	1.0430605	KM/SEC
Z	-2032.963	KM	DZ	1.0263292	KM/SEC

5.4 STANDARD DEVIATIONS

						A PRIORI			
X	39.96	M	DX	.01831	M/S	X	.0000	M	DX .0000 M/S
Y	251.2	M	DY	.13022	M/S	Y	.0000	M	DY .0000 M/S
Z	99.65	M	DZ	.10840	M/S	Z	.0000	M	DZ .0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE)

SMA	2534.79	KM	ECC	.2748409		APF	0.85954	DEG
LAN	242.2795	DEG	INC	84.9134	DEG	TFP	-1726.2	SEC
RCA	1838.123	KM	PALT	100.033	KM	PER	190.865	MIN
APO	3231.45	KM	AALT	1493.36	KM	TA	275.36	DEG

5.6 LUNAR HARMONICS USED LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.69816724E-04	C33	-.10037977E-04	C41	-.32631249E-05
C42	+.56093559E-06	C43	+.12795048E-05	C44	-.14542352E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.34667867E-04	S33	+.29318352E-04	S41	+.67981786E-05
S42	-.14832528E-05	S43	+.13312612E-05	S44	+.20805029E-06
RE	6378.14948	KE	398601.277	KM	4902.58002

5.7 DATA ARC LENGTH 12 HRS 00 MIN SOS= 4038

5.8 DATA SUMMARY

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	235/2123	235/2152	14	.139	.142
62	CC3	235/2248	236/0028	43	.304	.311
41	C3	235/2248	235/2259	11	.194	.203
41	CC3	235/1237	235/2215	463	.277	.285
12	C3	235/1233	235/1555	96	.326	.326

5.9 RESIDUAL PLOTS TAPE NO. N.A. ITEM NO. N.A.

5.10 REMARKS

TIME OF REPORT
DAY 236 , 11 HR , 00 MIN GMT

PREPARED BY BRUCE O'BRIEN (G)
O.D. ANALYST

```
L.O. V   ORBIT DETERMINATION  6142
DATA ARC LENGTH'  12  HRS  55  MIN
EPOCH   DAY 224 , 21 ' 25 '  0.524  GMT
X  MINUS 239691.46  KM
Y  MINUS 256767.78  KM
Z  MINUS 125376.37  KM
DX PLUS  1.2157410  KM/SEC
DY PLUS  .51833859  KM/SEC
DZ MINUS .50209773  KM/SEC
GEOCENTRIC TRUE OFDATE COORDINATES
R. R. PAULSON FLIGHT CHIEF
```

```
L.O. V   ORBIT DETERMINATION  6350
DATA ARC LENGTH'  12  HRS  50  MIN
EPOCH   DAY 225 , 22 ' 55 '  0.524  GMT
X  MINUS 160209.91  KM
Y  MINUS 303012.65  KM
Z  MINUS 153900.57  KM
DX PLUS  1.3684147  KM/SEC
DY PLUS  .73562984  KM/SEC
DZ MINUS .34651051  KM/SEC
GEOCENTRIC TRUE OFDATE COORDINATES
```

```
L.O. V   ORBIT DETERMINATION  6152
DATA ARC LENGTH'  12  HRS  55  MIN
EPOCH   DAY 226 ,  5 ' 15 '  0.524  GMT
X  MINUS 138684.11  KM
Y  MINUS 311699.57  KM
Z  MINUS 159494.39  KM
DX PLUS  1.3826465  KM/SEC
DY PLUS  .76719574  KM/SEC
DZ MINUS .38872458  KM/SEC
GEOCENTRIC TRUE OFDATE COORDINATES
R. R. PAULSON FLIGHT CHIEF
```

```
L.O. V   ORBIT DETERMINATION  6360
DATA ARC LENGTH'  12  HRS  45  MIN
EPOCH   DAY 227 ,  3 ' 35 '  0.524  GMT
X  MINUS 58648.322  KM
Y  MINUS 331606.55  KM
Z  MINUS 174184.65  KM
DX PLUS  1.4615963  KM/SEC
DY PLUS  .99221069  KM/SEC
DZ MINUS .19509105  KM/SEC
GEOCENTRIC TRUE OFDATE COORDINATES
```

```
L.O. V   ORBIT DETERMINATION  6162
DATA ARC LENGTH'  12  HRS  40  MIN
EPOCH   DAY 227 , 10 '  0 '  0.524  GMT
X  MINUS 34871.248  KM
Y  MINUS 334216.99  KM
Z  MINUS 176878.50  KM
DX PLUS  1.4846268  KM/SEC
DY PLUS  1.0748873  KM/SEC
DZ MINUS .05917325  KM/SEC
GEOCENTRIC TRUE OFDATE COORDINATES
R. R. PAULSON FLIGHT CHIEF
```

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6170 TAPE NO. 11941
ITEM NO. N.A.

5.2 EPOCH DAY 228 , 11 ' 30 ' 0.000 GMT SEQ. NO. 0119
HR MIN SEC COMPUTER G

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-288.51168	KM	DX	.46634077	KM/SEC
Y	-390.67749	KM	DY	1.1799821	KM/SEC
Z	-2712.6942	KM	DZ	.11978006	KM/SEC

5.4 STANDARD DEVIATIONS A PRIORI

X	101.7 M	DX	.02181 M/S	X	.0000 M	DX	.0000 M/S
Y	26.09 M	DY	.01071 M/S	Y	.0000 M	DY	.0000 M/S
Z	16.46 M	DZ	.02815 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.21	KM	ECC	.275209		APF	2.26077	DEG
LAN	335.490	DEG	INC	85.3576	DEG	TFP	-2974.25	SEC
RCA	1837.50	KM	PALT	99.4085	KM	PER	190.914	MIN
APO	3232.92	KM	AALT	1494.83	KM	TA	237.039	DEG
LAT	301.015	DEG	LONG	163.252	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.10279521E-04	C33	+.82068692E-05	C41	-.32631249E-05
C42	+.45026758E-06	C43	-.30007250E-06	C44	-.14426173E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.20975907E-05	S33	-.11681090E-05	S41	+.67981786E-05
S42	-.55744950E-06	S43	+.25819090E-06	S44	+.46495951E-06

5.7 DATA ARC LENGTH' 12 HRS 40 MIN SOS= 2653.1

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	228/1750	228/1757	6	.0303	-.1652
62	CC3	228/1803	229/0005	266	.1959	.0365
41	C3	228/1803	228/1808	6	.0403	-.0522
41	CC3	228/1130	228/1758	319	.2363	.0636

5.9 RESIDUAL PLOTS' TAPE NO. 12627 ITEM NO. N.A.

5.10 REMARKS' SOS COMPARABLE TO EARLIER ODS

TIME OF REPORT' PREPARED BY' HAMILTON/NIELSEN(R)
DAY 229 , 02 HR , 52 MIN GMT O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6378

TAPE NO. 11195
ITEM NO.
SEQ. NO. 0126
COMPUTER W

5.2 EPOCH DAY 229 , 6 ' 35 ' 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-300.86528	KM	DX	.46561069	KM/SEC
Y	-440.39515	KM	DY	1.1733999	KM/SEC
Z	-2720.9697	KM	DZ	.09314412	KM/SEC

5.4 STANDARD DEVIATIONS

X	107.6	M	DX	.02650	M/S	X	107.6	M	DX .0265 M/S
Y	54.10	M	DY	.01148	M/S	Y	54.10	M	DY .0115 M/S
Z	18.01	M	DZ	.03891	M/S	Z	18.01	M	DZ .0389 M/S

A PRIORI

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.05	KM	ECC	.274709		APF	2.58267	DEG
LAN	324.958	DEG	INC	85.1455	DEG	TAP	-3027.72	SEC
RCA	1838.65	KM	PALT	100.557	KM	PER	190.895	MIN
APO	3231.44	KM	AALT	1493.35	KM	TA	235.721	DEG
LAT	302.023	DEG	LONG	152.741	DEG			

5.6 LUNAR HARMONICS USED' LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.29595951E-04	C33	+.33913158E-04	C41	-.32631249E-05
C42	-.43519998E-05	C43	-.22025645E-05	C44	-.91170388E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.11018284E-04	S33	-.13801141E-04	S41	+.67981786E-05
S42	-.27159369E-05	S43	+.12225648E-05	S44	+.25726329E-05

5.7 DATA ARC LENGTH' 12 HRS 45 MIN SOS= 4012.8

5.8 DATA SUMMARY'

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	229/1836	229/1837	2	.0082	.0495
62	CC3	229/1845	229/1919	27	.1993	.5448
41	C3	229/0832	229/1904	85	.2470	.0624
41	CC3	229/0943	229/1839	515	.2368	.0530
12	C3	229/0943	229/0949	7	.0451	-.1532
12	CC3	229/0637	229/0939	167	.1777	.0728

5.9 RESIDUAL PLOTS' TAPE NO. 12565 ITEM NO.

5.10REMARKS' GOOD OD CONVERGED RAPIDLY

TIME OF REPORT'
DAY 229 , 20 HR , 50 MIN GMT

PREPARED BY' BUNCE
O.D. ANALYST

5. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6380 — TAPE NO. 11935 — ITEM NO.

5.2 EPOCH DAY 229 , 13 ' 0 ' 0.000 GMT — SEQ. NO. 0129 — COMPUTER G
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-211.34035	KM	DX	.47782549	KM/SEC
Y	-220.87790	KM	DY	1.1877250	KM/SEC
Z	-2692.7213	KM	DZ	.21293170	KM/SEC

5.4 STANDARD DEVIATIONS — A PRIORI

X	102.1 M	DX	.01949 M/S	X	.0000 M	DX	.0000 M/S
Y	57.05 M	DY	.01385 M/S	Y	.0000 M	DY	.0000 M/S
Z	14.84 M	DZ	.04296 M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OFDATE)

SMA	2535.25	KM	ECC	.274487		APF	2.57748	DEG
LAN	321.386	DEG	INC	85.0899	DEG	TFP	-2842.22	SEC
RCA	1839.35	KM	PALT	101.265	KM	PER	190.918	MIN
APO	3231.14	KM	AALT	1493.05	KM	TA	240.545	DEG
LAT	297.289	DEG	LONG	150.972	DEG			

5.6 LUNAR HARMONICS USED: LRC 7/28B MODIFIED

RE	6378.14948	KE	398601.277	KM	4902.58008
J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	-.30077546E-04	C33	+.32877987E-05	C41	-.32631249E-05
C42	-.56252857E-05	C43	+.18310819E-05	C44	-.69556845E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	-.92761315E-05	S33	+.84472506E-05	S41	+.67981786E-05
S42	-.39482152E-05	S43	-.43056773E-06	S44	-.95755249E-07

5.7 DATA ARC LENGTH: 12 HRS 45 MIN — SOS= 3398.5

5.8 DATA SUMMARY:

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	229/1836	229/1837	2	.0034	-.0796
62	CC3	229/1845	230/0144	312	.2995	.0222
41	C3	229/1843	229/1904	21	.0832	.1395
41	CC3	229/1300	229/1839	316	.1844	.0401
12	C3	230/0138	230/0144	3	.0640	-.2487

5.9 RESIDUAL PLOTS: TAPE NO. 11774 ITEM NO.

5.10REMARKS: GOOD OD CONVERGED RAPIDLY

TIME OF REPORT: DAY 230 , 03 HR , 44 MIN GMT — PREPARED BY: BUNCE (G) O.D. ANALYST

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6092

TAPE NO. N/A
ITEM NO. N/A
SEQ. NO. N/A
COMPUTER A

5.2 EPOCH: DAY 233 , 10 , 55 , 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	-817.4029	KM	DX	-.3775410	KM/SEC
Y	-2191.192	KM	DY	-.8548386	KM/SEC
Z	1507.5672	KM	DZ	-.8465959	KM/SEC

5.4 STANDARD DEVIATIONS

A PRIORI

X	41.91	M	DX	.00919	M/S	X	.0000 M	DX	.0000 M/S
Y	83.91	M	DY	.04040	M/S	Y	.0000 M	DY	.0000 M/S
Z	85.92	M	DZ	.03947	M/S	Z	.0000 M	DZ	.0000 M/S

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE)

SMA	2535.11	KM	ECC	.274739		APF	1.29352	DEG
LAN	269.595	DEG	INC	84.7118	DEG	TFP	3057.27	SEC
RCA	1838.62	KM	PALT	100.525	KM	PER	190.902	MIN
APO	3231.60	KM	AALT	1493.51	KM	TA	125.02	DEG

5.6 LUNAR HARMONICS USED LRC 7/28B MODIFIED

5.7 DATA ARC LENGTH 12 HRS 00 MIN SOS= 3961

5.8 DATA SUMMARY

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
12	C3	233/1.255	233/1403			
12	C3	233/1255	233/1403	60	.366	.367
12	CC3	233/1101	233/1249	71	.113	.113
41	C3	233/1159	233/2209	53	.126	.195
41	CC3	233/1253	233/2158	545	.249	.267
62	C3	233/2132	233/2156	18	.0537	.342
62	CC3	233/2203	233/2254	38	.247	.249

5.9 RESIDUAL PLOTS TAPE NO. N.A. ITEM NO. N.A.

5.10 REMARKS

J20	+.29917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.58299442E-05	C33	+.10768794E-04	C41	-.32631249E-05
C42	-.19788691E-05	C43	-.12970711E-05	C44	-.14542352E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.80223023E-05	S33	-.35266808E-06	S41	+.67981786E-05
S42	-.76917189E-05	S43	-.35874349E-05	S44	+.20805029E-06
RE	6378.14948	KE	398601.277	KM	4902.58002

TIME OF REPORT
DAY 234 , 00 HT , 00 MIN GMT

PREPARED BY BRUCE O'BRIEN (G)
O.D. ANALYST

1. ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6290 Rerun ITEM NO. 716
TAPE NO. 1255 (GMT)

5.2 EPOCH: DAY 230, 11 : 40 : 00
hr min sec

5.3 STATE VECTOR (SELC. 1950.0):

X	452.23031	km	$\dot{X}$	.39909770	km/sec
Y	1324.9764	km	$\dot{Y}$	.86349951	km/sec
Z	-1661.0695	km	$\dot{Z}$	1.2940803	km/sec

5.4 STANDARD DEVIATIONS: A PRIORI

X	75.89	m	$\dot{X}$	.0235	m/s	X		m	$\dot{X}$		m/sec
Y	38.02	m	$\dot{Y}$	.0394	m/s	Y		m	$\dot{Y}$		m/sec
Z	56.82	m	$\dot{Z}$	.0372	m/s	Z		m	$\dot{Z}$		m/sec

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE COORD.)

a	2534.934	km	e	.27425686		ω	2.4304716	deg.
Ω	308.87614	deg	i	84.938601	deg	Tp	-1436.6928	sec
r_p	1839.7116	km	h_p	101.62158	km	P	190.88266	min
r_a	3230.1581	km	h_a	1492.0681	km	Tan	286.76833	deg

5.6 LUNAR HARMONICS USED: 7/28B MØD LAT: _____ LONG: _____

5.7 DATA ARC LENGTH: 13 hrs 00 min. SOS=

5.8 DATA SUMMARY:

STA #	DATA TYPE	START TIME	STOP TIME	NUMBER OF POINTS	STANDARD DEVIATIONS	MEAN
62	C3	8/18 1912	8/18 1920	3	.00639	.0518
62	CC3	8/18 1924	8/19 0040	257	.218	.0397
41	CC3	8/18 1141	8/18 1919	438	.224	.0453

5.9 RESIDUAL PLOTS: TAPE NO. 11909 ITEM NO. 716

ATTACHED DISPLAYED AT CONF. ~~NOT~~ AVAILABLE

5.10 REMARKS: GØØD ØD. GØØD DATA ARC, SMØØTH PLØT, DUE TØ. RESØLVER CØRRECTIØNS.

TIME OF REPORT:
DAY 234, 10 hr 20 min GMT

Prepared by: J W Underwood R(W)B
O.D. Analyst

ORBIT DETERMINATION REPORT (LUNAR ELLIPSE)

5.1 O.D. IDENTIFICATION NO. 6094

TAPE NO. N.A.
ITEM NO. N.A.
SEQ. NO. N.A.
COMPUTER X

5.2 EPOCH DAY 235 , 12 , 30 , 0.000 GMT
HR MIN SEC

5.3 STATE VECTOR (SELENOCENTRIC 1950.0)

X	308.34738	KM	DX	.46496625	KM/SEC
Y	995.93717	KM	DY	1.0430605	KM/SEC
Z	-2032.963	KM	DZ	1.0263292	KM/SEC

5.4 STANDARD DEVIATIONS

						A PRIORI			
X	39.96 M	DX	.01831 M/S	X	.0000 M		DX	.0000 M/S	
Y	251.2 M	DY	.13022 M/S	Y	.0000 M		DY	.0000 M/S	
Z	99.65 M	DZ	.10840 M/S	Z	.0000 M		DZ	.0000 M/S	

5.5 CORRESPONDING ORBITAL PARAMETERS (SELENOGRAPHIC TRUE OF DATE)

SMA	2534.79	KM	ECC	.2748409		APF	0.85954	DEG
LAN	242.2795	DEG	INC	84.9134	DEG	TFP	-1726.2	SEC
RCA	1838.123	KM	PALT	100.033	KM	PER	190.865	MIN
APO	3231.45	KM	AALT	1493.36	KM	TA	275.36	DEG

5.6 LUNAR HARMONICS USED LRC 7/28B MODIFIED

J20	+.20917160E-03	J30	-.17382163E-04	J40	-.37928499E-04
C21	-.15706427E-06	C22	+.17664317E-04	C31	+.22722029E-04
C32	+.69816724E-04	C33	-.10037977E-04	C41	-.32631249E-05
C42	+.56093559E-06	C43	+.12795048E-05	C44	-.14542352E-06
S21	-.55150425E-05	S22	-.16672685E-05	S31	-.13551220E-04
S32	+.34667867E-04	S33	+.29318352E-04	S41	+.67981786E-05
S42	-.14832528E-05	S43	+.13312612E-05	S44	+.20805029E-06
RE	6378.14948	KE	398601.277	KM	4902.58002

5.7 DATA ARC LENGTH 12 HRS 00 MIN SOS= 4038

5.8 DATA SUMMARY

STA NO.	DATA TYPE	START TIME	STOP TIME	NUMBER POINTS	STANDARD DEVIATION	MEAN
62	C3	235/2123	235/2152	14	.139	.142
62	CC3	235/2248	236/0028	43	.304	.311
41	C3	235/2248	235/2259	11	.194	.203
41	CC3	235/1237	235/2215	463	.277	.285
12	C3	235/1233	235/1555	96	.326	.326

5.9 RESIDUAL PLOTS TAPE NO. N.A. ITEM NO. N.A.

5.10 REMARKS

TIME OF REPORT
DAY 236 , 11 HR , 00 MIN GMT

PREPARED BY BRUCE O'BRIEN (G)
O.D. ANALYST

OD	First Data	Last Data	PHOTO SITES SUPPORTED			
			PCC	FCC	Update	Postflight
4102	217/1657	217/1720		A-1, A-2, A-3		
4104	217/1657	217/2020				
4106	217/1657	217/2225				
4208	217/2220	218/0403				
4210	217/2220	218/0654				
4312	217/2220	218/0929	A-4+, A-6+			
4314	217/2220	218/1333		A-4*, A-6*		
4116	218/0649	218/1517				
4118	218/0649	218/2215	A-7.1*, A-8*, A-9*, A-10*	A-7.1*, A-8* A-9*, A-10*		A-1, A-2 A-3, A-4
5302	219/0846	219/1002				
5304	219/0846	219/1141				
5306	219/0848	219/1358				
5308	219/0848	219/1541				
5110	219/0848	219/1819				
5214	219/0848	220/0106	A-11.2, A-12, A-13+			A-6
5216	219/1500	220/0435				A-7.1

+ PCC maneuver design also used. * FCC maneuver design also used.

OD	First Data	Last Data	PHOTO SITES SUPPORTED			
			PCC	FCC	Update	Postflight
5318	219/1500	220/0849		A-11.2, A-12, A-13*		
5320	219/2300	220/1159				
5122	219/2300	220/1656	A-14*, V-1*		A-13*	A-8, A-9
5124	220/0730	220/2159				A-10
5226	220/1600	221/0103				A-11.2, A-12
6202	221/0534	221/0650				
6204	221/0534	221/0820		A-14, V-1		
6308	221/0720	221/1119	V-2.1			
6310	221/0720	221/1429				
6312	221/0720	221/1629	V-3.1, A-15, V-4	V-2.1		
6114	221/0720	221/2019	V-5.1	V-3.1, A-15, V-4		A-13
6116	221/1345	222/0239	V-6, V-16.1, V-8a, V-8b	V-5.1		A-14, V-1
6218	221/2007	222/0901	V-9.1, A-17.1	V-6, V-16.1		V-2.1
6320	222/0540	222/1824	V-10, V-11a	V-8a, V-8b	V-6	V-3.1, A-15
6122	222/1200	222/2118	V-11b, V-12	V-9.1, A-17.1	V-8a, V-8b	V-4, V-5.1
6124	222/1825	223/0709	V-13, V-14, V-18.1	V-10, V-11a	V-9.1	V-6, A-16.1
6226	223/0050	223/1329	V-15.1, V-16a	V-11b, V-12	V-10	V-8a, V-8b

OD	First Data	Last Data	PHOTO SITES SUPPORTED			
			PCC	FCC	Update	Postflight
6328	223/0710	223/1954	V-16b, A-19	V-13, V-14, A-18.1	V-11a, V-11b	V-9.1, A-17.1
6330	223/1330	223/2149		V-15.1, V-16a	V-12, V-13, V-14	V-10, V-11a
6132	223/1945	224/0839	V-18, V-19, A-20, V-21	V-16b, A-19	V-15.1	V-11b
6134	223/2305	224/1141			V-16a, V-16b	V-12, V-13
6236	224/0530	224/1829	V-22, V-23.2	V-18, V-19		V-14, V-18.1, V-15.1
6338	224/1157	225/0039			V-18	
6340	224/1500	225/0349	V-24, V-25, A-21	A-20, V-21	V-19	V-16a, V-16b
6142	224/2125	225/1018	V-26.1, V-27a	V-22, V-23.2	V-21	A-19
6144	225/0346	225/1522	V-27b, V-28	V-24, V-25, A-21	V-22, V-23.2	V-18, V-19
6246	225/1005	225/2303	V-29, A-22, V-30	V-26.1, V-27a	V-24, V-25	A-20, V-21
6348	225/1630	226/0519	V-31, V-32	V-27b, V-28	V-26.1, V-27a	V-22, V-23.2
6350	225/2255	226/1144	V-33, V-34	V-29, A-22, V-30	V-27b, V-28	V-24, V-25
6152	226/0515	226/1809	V-35, V-36	V-31, V-32	V-29, V-30	A-21, V-26.1, V-27a
6254	226/1140	227/0026			V-31, V-32	
6256	226/1450	227/0349	V-37, A-23	V-33, V-34		V-27b, V-28
6358	226/2120	227/0959	V-38	V-35, V-36	V-33, V-34	V-29, A-22
6360	227/0335	227/1619	A-24	V-37, A-23	V-35, V-36	V-30, V-31

OD	First Data	Last Data	PHOTO SITES SUPPORTED			
			PCC	FCC	Update	Postflight
6162	227/1000	227/2239	V-40, V-41	V-38	V-37	V-32, V-33
6264	227/1620	228/0503	V-42a, V-42b	A-24	V-38	V-34, V-35
6266	227/2240	228/1135	V-43.2, A-25	V-40, V-41		V-36, V-37
6368	228/0506	228/1744	V-45.1, V-46	V-42a, V-42b	V-40, V-41	A-23, V-38
6170	228/1130	220/0005		V-43.2, A-25	V-42a, V-42b	A-24
6172	228/1755	229/0632	V-48, V-49		A-43.2, A-25	V-40, V-41
6274	228/2103	229/0949		V-45.1, V-46		V-42a
6276	229/0328	229/1611				V-42b, V-43.2
6378	229/0637	229/1919	V-50, V-51	V-48, V-49	V-45.1, V-46	A-25
6380	229/1300	230/0144			V-48	V-45.1
6182	229/1610	230/0455		V-50, V-51	V-49	V-46
6184	229/2230	230/1114			V-50	V-48
6286	230/0145	230/1425			V-51	V-49
6290	230/1141	231/0040				V-50, V-51

POSTFLIGHT PHOTO EVALUATION DATA

The Lunar Orbiter V photographic mission encompassed 70 photo sites or sequences, beginning in Orbit 2 (first ellipse) and continuing through Orbit 83 (final ellipse). During the mission, final design of each sequence was based upon an orbit determination using a four-orbit data arc (about 12.5 hours; two orbits or about 16.5 hours in the first and second ellipses). The end of this data arc generally lay four orbits (two orbits in first and second ellipses) before initiation of the photo sequence. In addition, most designs following that of Site V-5.1 were updated using ODs based on data arcs ending as late as two orbits prior to the photo sequence.

To enable accurate postmission evaluation of actual photo coverage, a later OD state was mapped to just prior to the beginning of the photo sequence. These mappings were performed as part of the standard orbit determination procedure for each OD containing a photo sequence in its data arc. The selenocentric 1950.0 state vectors (as punched by ODPL on cards) will be used as input to the FPAC user program EVAL, which will calculate the coverage of each photo sequence using the actual photo times obtained from edge data on the photo frames.

A list of the cards generated by ODPL and a table of the design photo times follow.

```
SITE A-1            LUNAR ORBITER MISSION V        ODPL 4118
TRANST     1.     67.      8.      6.     11.     21.      0.000
TRANSF+2   -1149.53474426  -3164.78396606   2740.41796875
                .40597954      -1.00419775      -.27597141

SITE A-2            LUNAR ORBITER MISSION V        ODPL 4118
TRANST     1.     67.      8.      6.     13.     33.      0.000
TRANSF+2   -2744.59072876  -6851.02099609  -1254.22633362
                .04624190      -.06464063      -.54105550

SITE A-3            LUNAR ORBITER MISSION V        ODPL 4118
TRANST     1.     67.      8.      6.     17.     16.      0.000
TRANSF+2    -755.28511047  -1458.87892151  -4848.23974609
                .34122316       .83698282       .29655041

SITE A-4            LUNAR ORBITER MISSION V        ODPL 4118
TRANST     1.     67.      8.      7.      0.     34.      0.000
TRANSF+2   -1894.52770996  -4338.07470703  -4969.61791992
                .22405735       .58269209      -.16818335

SITE A-6            LUNAR ORBITER MISSION V        ODPL 5214
TRANST     1.     67.      8.      7.     13.     50.      0.000
TRANSF+2   -2430.35772705  -6259.80242920    400.07468796
                .15353438      -.34507725      -.54603758

SITE A-7.1          LUNAR ORBITER MISSION V        ODPL 5216
TRANST     1.     67.      8.      7.     20.     50.      0.000
TRANSF+2    -680.18808746  -1328.77299500  -4692.28912354
                .34698284       .85653625       .34779191

SITE A-8            LUNAR ORBITER MISSION V        ODPL 5122
TRANST     1.     67.      8.      8.      1.     41.     30.000
TRANSF+2   -1854.86968994  -4309.18668965  -4946.04852295
                .22589346       .59052455      -.14741799

SITE A-9            LUNAR ORBITER MISSION V        ODPL 5122
TRANST     1.     67.      8.      8.      9.      4.     30.000
TRANSF+2   -2471.66378784  -5956.29364014  -4046.76974487
                .12941720       .36198506      -.35097515

SITE A-10           LUNAR ORBITER MISSION V        ODPL 5124
TRANST     1.     67.      8.      8.     14.     52.      0.000
TRANSF+2   -2440.20336914  -6270.50201416    408.77833176
                .15345375      -.34303989      -.54458715

SITE A-11.2         LUNAR ORBITER MISSION V        ODPL 5226
TRANST     1.     67.      8.      8.     21.     51.      0.000
TRANSF+2   -1124.10162354  -3120.80346680   2675.87371826
                .40990850      -1.02367331      -.26120145

SITE A-12           LUNAR ORBITER MISSION V        ODPL 5226
TRANST     1.     67.      8.      9.     02.     43.      0.000
TRANSF+2   -1875.5182  -4328.8996   -4920.4062
                .22510549       .59029137      -.15016763

SITE A-13           LUNAR ORBITER MISSION V        ODPL 6114
TRANST     1.     67.      8.      9.      9.     32.      0.000
TRANSF+2   -1111.29324341  -2872.98715210    306.48501968
                .14374541      -.26333619      -1.07029283
```

```
SITE A-14            LUNAR ORBITER MISSION V          ODPL 6116
TRANST     1.     67.      8.      9.     15.     57.      0.000
TRANSF+2    -1132.55961609  -2909.72567749    144.75286484
                .11510988       -.19065580     -1.07494271

SITE V-1             LUNAR ORBITER MISSION V          ODPL 6116
TRANST     1.     67.      8.      9.     20.     57.      0.000
TRANSF+2     674.98703003   1748.90124512   -239.78562954
                .07136432        .00609667      1.80311866

SITE V-2.1           LUNAR ORBITER MISSION V          ODPL 6218
TRANST     1.     67.      8.     10.      3.     15.      0.000
TRANSF+2     640.02582550   1706.01576233   -693.96678925
                .19139372        .31573309      1.72059555

SITE V-3             LUNAR ORBITER MISSION V          ODPL 6320
TRANST     1.     67.      8.     10.      9.     45.      0.000
TRANSF+2     678.85221863   1721.90118408    134.66352272
                .02898040       -.26452272      1.81132405

SITE A-15            LUNAR ORBITER MISSION V          ODPL 6320
TRANST     1.     67.      8.     10.     10.     45.      0.000
TRANSF+2    -879.85144043  -2387.04397583   1300.82008362
                .32805144       -.74235774      -.91694401

SITE V-4             LUNAR ORBITER MISSION V          ODPL 6122
TRANST     1.     67.      8.     10.     12.     45.      0.000
TRANSF+2     589.72190094   1621.01722717  -1033.71632385
                .27484197        .52826770      1.60890983

SITE V-5.1           LUNAR ORBITER MISSION V          ODPL 6122
TRANST     1.     67.      8.     10.     16.      5.      0.000
TRANSF+2     677.60281372   1745.59797668   -111.21352999
                .04317500       -.08785699      1.81262629

SITE V-6             LUNAR ORBITER MISSION V          ODPL 6124
TRANST     1.     67.      8.     10.     22.     30.      0.000
TRANSF+2     678.14662933   1712.90335083    185.21968106
                .04053806       -.30229039      1.80841333

SITE A-16.1          LUNAR ORBITER MISSION V          ODPL 6124
TRANST     1.     67.      8.     11.      3.     55.      0.000
TRANSF+2    -614.75185304  -1283.53344727  -2618.36190796
                .39629617       1.04841569      -.31813327

SITE V-8A            LUNAR ORBITER MISSION V          ODPL 6226
TRANST     1.     67.      8.     11.      8.      5.      0.000
TRANSF+2     672.29199982   1677.34967041    357.00075531
                .09073352       -.42732927      1.78880285

SITE V-8B            LUNAR ORBITER MISSION V          ODPL 6226
TRANST     1.     67.      8.     11.     11.     13.      0.000
TRANSF+2     680.18695831   1734.03126526     17.91872668
                .00815741       -.17944145      1.81637929

SITE V-9             LUNAR ORBITER MISSION V          ODPL 6328
TRANST     1.     67.      8.     11.     14.     22.      0.000
TRANSF+2     673.57416534   1746.91108704   -208.71636009
                .07563375       -.01912161      1.80739601
```

```
SITE A-17.1          LUNAR ORBITER MISSION V          ODPL 6328
TRANST     1.     67.      8.     11.     18.     35.      0.000
TRANSF+2     -847.67568152  -2331.95474243   1373.17909241
                .34646222      -.77915227      -.89325710

SITE V-10            LUNAR ORBITER MISSION V          ODPL 6330
TRANST     1.     67.      8.     11.     20.     45.      0.000
TRANSF+2      676.97024536   1744.12104797   -126.91083336
                .05303720      -.07705848      1.81334102

SITE V-11A           LUNAR ORBITER MISSION V          ODPL 6330
TRANST     1.     67.      8.     11.     23.     57.      0.000
TRANSF+2      678.84249115   1738.11659241    -29.95769668
                .02696242      -.14725239      1.81650156

SITE V-11B           LUNAR ORBITER MISSION V          ODPL 6132
TRANST=1.,67.,8.,12.,3.,14.,20.09
TRANSF+2=652.31458,1590.9545,638.34506
TRANSF+5=-0.16790240,-0.63720677,1.7259730

SITE V-12            LUNAR ORBITER MISSION V          ODPL 6134
TRANST     1.     67.      8.     12.      6.     24.      0.000
TRANSF+2      664.80039978   1641.01860046    487.81748581
                .12219406      -.52706377      1.76455902

SITE V-13            LUNAR ORBITER MISSION V          ODPL 6134
TRANST     1.     67.      8.     12.      9.     31.      0.000
 TRANSF+2   678.66188   1730.8838     46.184999
    .0079127728   -.20359393   1.8162230

SITE A-18.1          LUNAR ORBITER MISSION V          ODPL 6236
TRANST     1.     67.      8.     12.     11.     45.      0.000
TRANSF+2     -653.92523956  -1352.69232178  -2593.11993408
                .28668249      1.03253843      -.35128836

SITE V-14            LUNAR ORBITER MISSION V          ODPL 6236
TRANST     1.     67.      8.     12.     12.     50.      0.000
TRANSF+2      623.62647247   1467.12528992    878.44587708
                .23836940      -.81268615      1.64006947

SITE V-15.1          LUNAR ORBITER MISSION V          ODPL 6236
TRANST     1.     67.      8.     12.     16.      0.      0.000
TRANSF+2      638.16588593   1537.38940430    770.33871460
                .20470791      -.73535477      1.68246187

SITE V-16A           LUNAR ORBITER MISSION V          ODPL 6340
TRANST     1.     67.      8.     12.     19.      7.      0.000
TRANSF+2      672.72711182   1679.66505432    343.35740662
                .07650559      -.42263126      1.79094960

SITE V-16B           LUNAR ORBITER MISSION V          ODPL 6340
TRANST     1.     67.      8.     12.     22.     19.      0.000
TRANSF+2      667.51187897   1654.34031677    442.45518112
                .10473881      -.49646429      1.77345282

SITE A-19            LUNAR ORBITER MISSION V          ODPL 6142
TRANST     1.     67.      8.     13.      2.     33.      0.000
TRANSF+2     -978.86627960  -2617.42001343    965.07833099
                .26834623      -.56559691      -.99572902
```

```
SITE V-18            LUNAR ORBITER MISSION V        ODPL 6144
TRANST     1.     67.      8.     13.      7.     50.      0.000
TRANSF+2      677.50397491   1709.29078674    203.97747231
                .03558632      -.32165214      1.80645572

SITE V-19            LUNAR ORBITER MISSION V        ODPL 6144
TRANST     1.     67.      8.     13.     10.     57.      0.000
TRANSF+2      670.67351532   1749.10931396   -237.79439926
                .08928515      -.00349186      1.80336107

SITE A-20            LUNAR ORBITER MISSION V        ODPL 6246
TRANST     1.     67.      8.     13.     18.     28.     40.000
TRANSF+2     -979.25862122  -2632.42160034    932.59632111
                .20664604      -.55160505     -1.00245520

SITE V-21            LUNAR ORBITER MISSION V        ODPL 6246
TRANST     1.     67.      8.     13.     20.     48.     40.000
TRANSF+2      462.08245087    979.00061035   1561.13764954
                .43616592     -1.27357937      1.19025867

SITE V-22            LUNAR ORBITER MISSION V        ODPL 6348
TRANST     1.     67.      8.     13.     23.     53.      0.000
TRANSF+2      606.59053802   1424.12310791    996.72085571
                .27176603      -.90189247      1.58302861

SITE V-23.1          LUNAR ORBITER MISSION V        ODPL 6350
TRANST     1.     67.      8.     14.      3.      0.      0.000
TRANSF+2      658.15937805   1608.75930786    591.15968323
                .14918485      -.60887451      1.73638512

SITE V-24            LUNAR ORBITER MISSION V        ODPL 6350
TRANST     1.     67.      8.     14.      6.      8.      0.000
TRANSF+2      677.36006927   1698.46968079    266.59672546
                .05404752      -.36988498      1.79834898

SITE V-25            LUNAR ORBITER MISSION V        ODPL 6350
TRANST     1.     67.      8.     14.      9.     35.      0.000
TRANSF+2      403.25609970    812.74108124   1702.48703003
                .47658883     -1.35291559      1.04512642

SITE A-21            LUNAR ORBITER MISSION V        ODPL 6152
TRANST     1.     67.      8.     14.     10.     23.      0.000
TRANSF+2     -966.56420135  -2599.47195435    984.93569183
                .27638137      -.57916632      -.99343374

SITE V-26.1          LUNAR ORBITER MISSION V        ODPL 6152
TRANST     1.     67.      8.     14.     12.     39.      0.000
TRANSF+2      574.70368195   1320.84608459   1162.07830811
                .32269224     -1.01724488      1.49201921

SITE V-27A           LUNAR ORBITER MISSION V        ODPL 6152
TRANST     1.     67.      8.     14.     15.     42.      0.000
TRANSF+2      673.57533112   1677.92764282    359.10842896
                .08111985      -.43833961      1.78545749

SITE V-27B           LUNAR ORBITER MISSION V        ODPL 6256
TRANST     1.     67.      8.     14.     18.     55.      0.000
TRANSF+2      660.41705322   1617.48443604    566.87181091
                .14275285      -.59108517      1.74244158
```

```
SITE V-28          LUNAR ORBITER MISSION V        ODPL 6256
TRANST     1.     67.      8.     14.     22.     2.      0.000
TRANSF+2      679.33683777   1722.52290344    135.29585266
                .01494158      -.27425832      1.60926432

SITE V-29          LUNAR ORBITER MISSION V        ODPL 6358
TRANST     1.     67.      8.     15.      1.    20.      0.000
TRANSF+2      627.37916565   1493.91725159    865.91188049
                .23407435      -.80822915      1.64209813

SITE A-22          LUNAR ORBITER MISSION V        ODPL 6358
TRANST     1.     67.      8.     15.      2.    18.      0.000
TRANSF+2     -962.95558929  -2592.39746094    996.34556580
                .27832322      -.58501627      -.99144273

SITE V-30          LUNAR ORBITER MISSION V        ODPL 6360
TRANST     1.     67.      8.     15.      4.    14.      0.000
TRANSF+2      636.51476288   1657.32620239   -926.55720520
                .25655916       .45533244      1.64696598

SITE V-31          LUNAR ORBITER MISSION V        ODPL 6360
TRANST     1.     67.      8.     15.      7.    49.      0.000
TRANSF+2      487.65765381   1064.34408569   1478.85406494
                .41922298      -1.22234979      1.26332310

SITE V-32          LUNAR ORBITER MISSION V        ODPL 6162
TRANST     1.     67.      8.     15.     10.    54.      0.000
TRANSF+2      612.38154602   1446.33743286    958.98342133
                .26767812      -.87273172      1.60069663

SITE V-33          LUNAR ORBITER MISSION V        ODPL 6162
TRANST     1.     67.      8.     15.     17.    12.      0.000
TRANSF+2      662.26116180   1622.53082275    554.33816528
                .14440690      -.57962453      1.74499281

SITE V-34          LUNAR ORBITER MISSION V        ODPL 6264
TRANST     1.     67.      8.     15.     20.    20.     50.000
TRANSF+2      675.26407623   1688.01922607    322.92827225
                .07222218      -.41068858      1.78978915

SITE V-35          LUNAR ORBITER MISSION V        ODPL 6264
TRANST     1.     67.      8.     15.     23.    38.      0.000
TRANSF+2      613.01538086   1448.85285950    956.22247314
                .26131896      -.87250747      1.60114574

SITE V-36          LUNAR ORBITER MISSION V        ODPL 6266
TRANST     1.     67.      8.     16.      2.    46.      0.000
TRANSF+2      651.19699860   1586.99124146    658.37516785
                .17177641      -.65723648      1.71526065

SITE V-37          LUNAR ORBITER MISSION V        ODPL 6266
TRANST     1.     67.      8.     16.      5.    58.     30.000
TRANSF+2      633.18709564   1522.53540039    812.20435333
                .21768410      -.76926383      1.66202252

SITE A-23          LUNAR ORBITER MISSION V        ODPL 6368
TRANST     1.     67.      8.     16.      9.    58.      0.000
TRANSF+2     -756.55005646  -2148.24438477   1546.31851196
                .38811400      -.88904628      -.82860257
```

```
SITE V-38            LUNAR ORBITER MISSION V        ODPL 6368
TRANST     1.     67.      8.     16.     12.     27.      0.000
TRANSF+2      513.50729370   1137.55162048   1401.87506104
                .38939802     -1.17646553      1.32493196

SITE A-24            LUNAR ORBITER MISSION V        ODPL 6170
TRANST     1.     67.      8.     16.     19.     42.      0.000
TRANSF+2     -950.41575623  -2625.11923218    925.69779968
                .26559155      -.55215625     -1.00673431

SITE V-40            LUNAR ORBITER MISSION V        ODPL 6172
TRANST     1.     67.      8.     17.      0.     58.      0.000
TRANSF+2      683.62617493   1724.09179688    147.14190102
                .02574018      -.28220722      1.80462293

SITE V-41            LUNAR ORBITER MISSION V        ODPL 6172
TRANST     1.     67.      8.     17.      4.      3.     30.000
TRANSF+2      665.38982391   1747.30697632   -443.04069138
                .13652570       .13553539      1.76986624

SITE V-42A           LUNAR ORBITER MISSION V        ODPL 6274
TRANST     1.     67.      8.     17.      7.     22.     30.000
TRANSF+2      673.63581848   1665.61318970    421.55562973
                .10538600      -.48326432      1.77062860

SITE V-42B           LUNAR ORBITER MISSION V        ODPL 6276
TRANST     1.     67.      8.     17.     10.     33.     30.000
TRANSF+2      673.81858063   1664.32185364    426.02372360
                .10752758      -.48637680      1.76970291

SITE V-43.2          LUNAR ORBITER MISSION V        ODPL 6276
TRANST     1.     67.      8.     17.     13.     40.      0.000
TRANSF+2      684.22360229   1747.50511169    -54.59978676
                .03151405      -.13667471      1.80816984

SITE A-25            LUNAR ORBITER MISSION V        ODPL 6378
TRANST     1.     67.      8.     17.     17.     55.      0.000
TRANSF+2     -928.51690674  -2485.21777344   1140.95516968
                .30582334      -.66382137      -.96295745

SITE V-45.1          LUNAR ORBITER MISSION V        ODPL 6380
TRANST     1.     67.      8.     17.     23.     28.     30.000
TRANSF+2      489.05648575   1071.69607544   1474.79774475
                .42355540     -1.21757159      1.26435409

SITE V-46            LUNAR ORBITER MISSION V        ODPL 6182
TRANST     1.     67.      8.     18.      2.     37.      0.000
TRANSF+2      548.91482544   1243.60372925   1275.46635437
                .36376299     -1.08935320      1.41689719

SITE V-48            LUNAR ORBITER MISSION V        ODPL 6184
TRANST     1.     67.      8.     18.      8.     57.     30.000
TRANSF+2      577.40634155   1329.08656311   1156.94799805
                .33240836     -1.00798695      1.49257863

SITE V-49            LUNAR ORBITER MISSION V        ODPL 6286
TRANST     1.     67.      8.     18.     12.      9.     50.000
TRANSF+2      548.28912354   1241.58110046   1278.45310974
                .36860738     -1.08942126      1.41506678
```

```
SITE V-50            LUNAR ORBITER MISSION V          ODPL 6290
TRANST     1.     67.      8.     18.     18.     32.      0.000
TRANSF+2       541.17623138   1221.01974487   1304.62441711
                .27828210     -1.10576448      1.39710934

SITE V-51            LUNAR ORBITER MISSION V          ODPL 6290
TRANST     1.     67.      8.     18.     21.     38.     30.000
TRANSF+2       626.46026611   1479.53735352    901.38063049
                .25803358      -.82682705      1.6243478
```

DESIGN PHOTO TIMES

SITE	Day	Hour	Minute	Second
A-1	218	11	22	03.3
A-2		13	33	25.72
A-3		17	17	06.28
A-4	219	00	34	59.68
A-6		13	50	51.37
A-7.1		20	50	19.7
A-8	220	01	42	05.2
A-9		09	05	00.
A-10		14	52	19.88
A-11.2		21	51	31.45
A-12	221	02	43	34.8
A-13		09	32	18.73
A-14		15	57	40.68
V-1		20	57	43.76
V-2.1	222	03	22	00.77
V-3		09	49	36.2
A-15		10	52	51.43
V-4		12	51	49.71
V-5.1		16	11	29.45
V-6		22	34	08.90
A-16.1	223	03	58	21.18
V-8a		08	07	24.67
V-8b		11	18	34.66
V-9.1		14	30	49.94
A-17.1		18	40	05.67
V-10		20	45	36.83
V-11a	224	00	04	0 .69
V-11b		03	15	08.7
V-12		06	25	28.89
V-13		09	36	52.73
A-18.1		11	49	22.47
V-14		12	54	03.72
V-15.1		16	03	49.28
V-16a		19	10	03.15
V-16b		22	21	09.42
A-19	225	02	34	32.10
V-18		07	54	54.21

SITE	Day	Hour	Minute	Second
V-19		11	00	59.23
A-20		18	29	39.86
V-21		20	49	37.40
V-22		23	55	27.31
V-23.2	226	03	02	44.05
V-24		06	10	11.99
V-25		09	35	23.24
A-21		10	24	50.70
V-26.1		12	40	40.43
V-27a		15	44	48.04
V-27b		18	55	52.61
V-28		22	02	48.50
V-29	227	01	21	30.97
A-22		02	20	06.91
V-30		04	16	10.77
V-31		07	54	35.37
V-32		10	54	20.11
V-33		17	14	50.29
V-34		20	21	48.99
V-35		23	38	44.28
V-36	228	02	47	52.19
V-37		05	59	41.99
A-23		10	10	08.62
V-38		12	28	20.95
A-24		19	43	01.42
V-40	229	01	06	28.73
V-41		04	04	45.94
V-42a		07	23	37.04
V-42b		10	34	37.27
V-43.2		13	41	08.83
A-25		17	56	45.31
V-45.1		23	29	52.50
V-46	230	02	38	01.23
V-48		08	58	47.19
V-49		12	10	29.67
V-50		18	33	10.67
V-51		21	39	45.74

DOPPLER DATA – VELOCITY MANEUVERS

Doppler Shift and Associated Burn Parameters During Lunar Orbiter Mission V Velocity Maneuvers

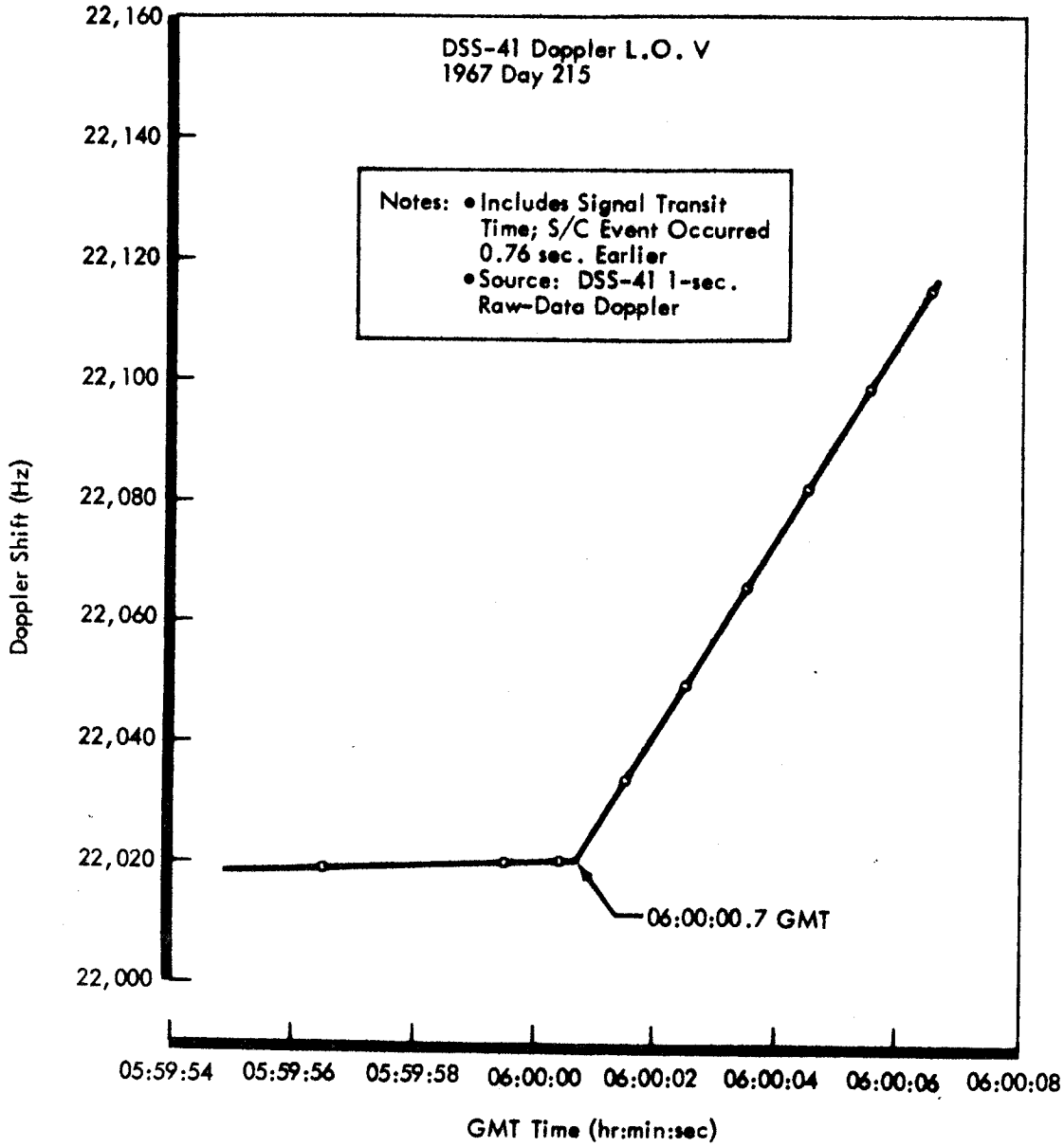
This section documents the doppler shifts and burn parameters estimated from doppler data during the Lunar Orbiter Mission V midcourse, deboost, and transfer maneuvers.

Figures 1 through 4 show the predicted doppler shift versus time for each of the maneuvers. These real-time plots were drawn using data from the most recent PRDL (predicts) run prior to each burn. During each burn, a number of points of the observed doppler shift were hand-plotted on these graphs to give a near real time estimate of the accuracy of each burn.

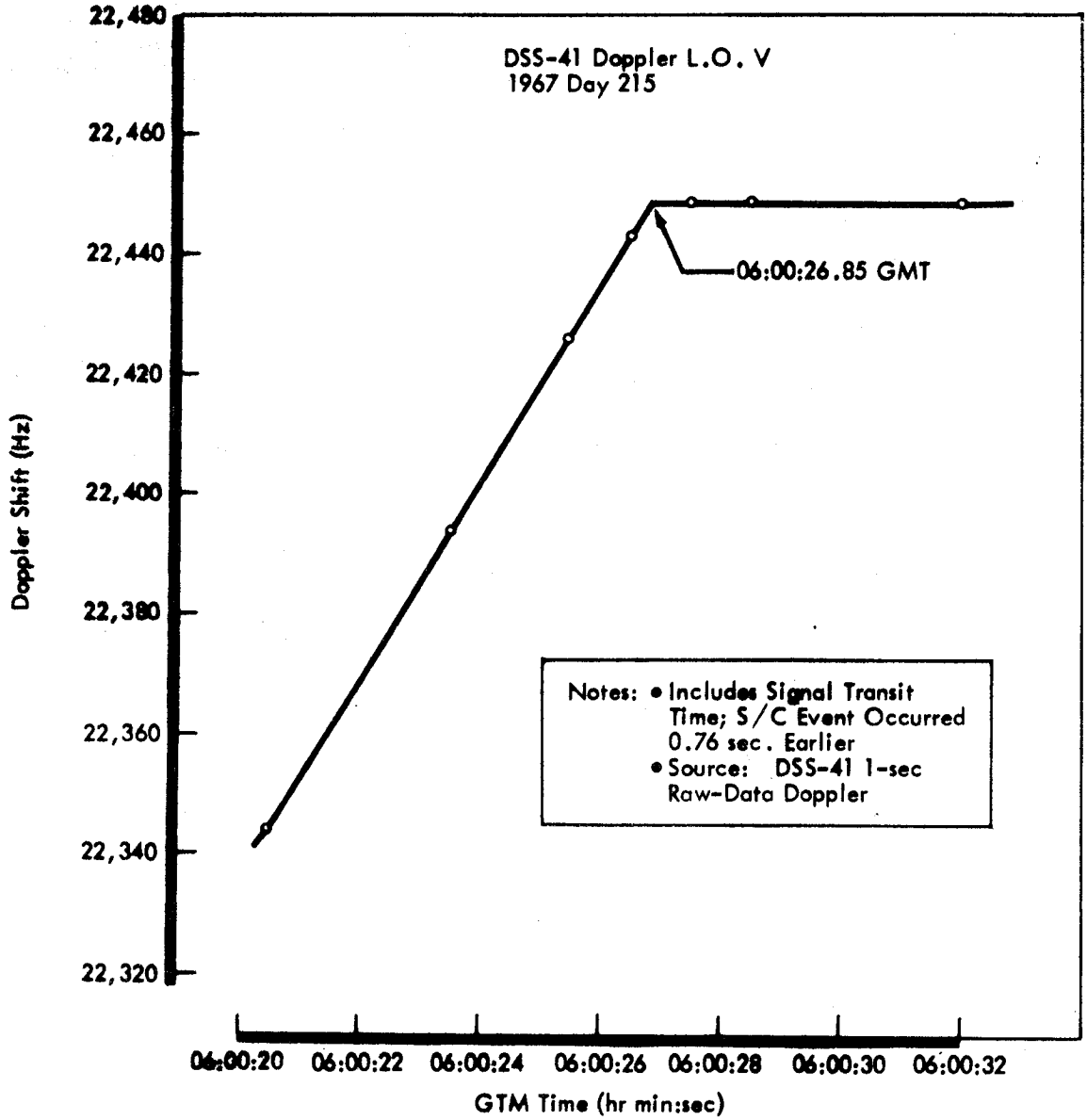
Figures 5 through 11 show the beginning and end of the observed doppler shift versus time for each of the maneuvers. The doppler shift was obtained from the 1-second raw doppler data received during each burn by the prime viewing station. The 1-megacycle doppler bias has not been stripped from the doppler shift.

The following table summarized the important parameters of each burn as estimated from Figures 5 through 11. The times shown are spacecraft time (signal transit time subtracted).

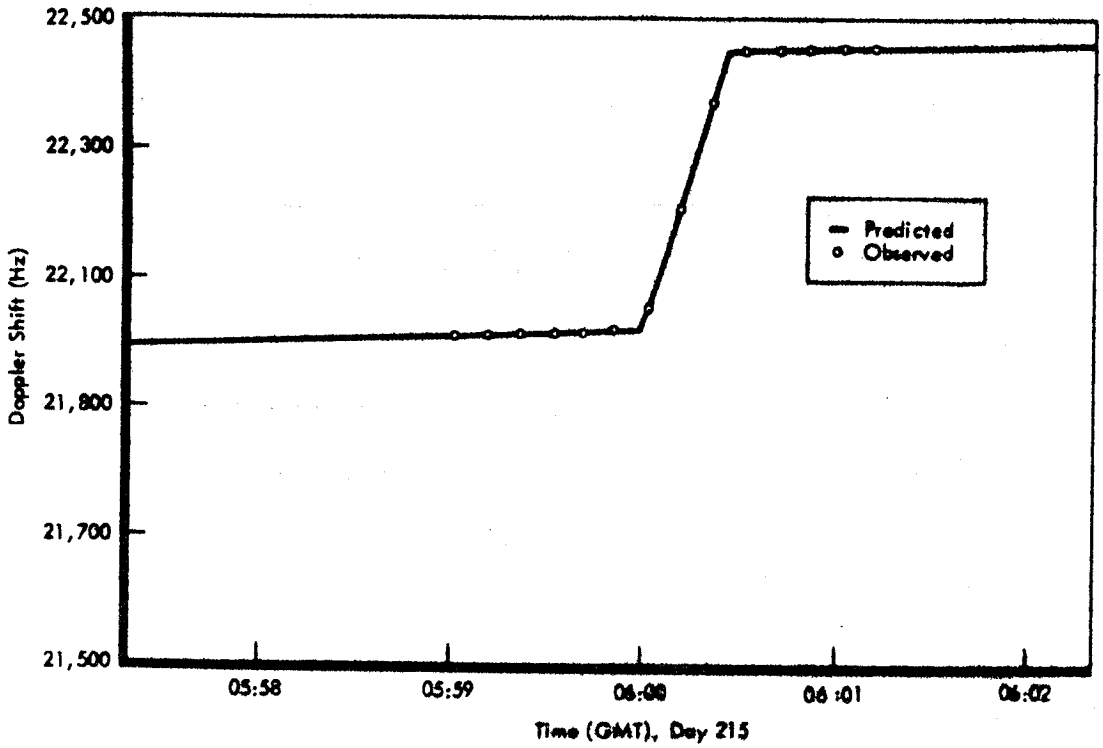
Maneuver	Prime Station	Ignition (GMT)	Commanded Ignition (GMT)	Burn Time (sec)	Predicted Doppler Shift	Actual Doppler Shift
Midcourse	41	215/05:59:59.94±0.1	215/06:00:00.0	26.15±0.1	429.5 H_z	429.0 H_z±1.0
Deboost	12	217/16:48:54.43±0.1	217/16:48:54.4	498.1±0.1	1850.0 H_z	1824.0 H_z±0.1
First Transfer	41	219/08:43:48.15±0.25	219/08:43:48.7	11.4±0.25	73.0 H_z	75.0 H_z±1.0
Second Transfer	41	221/05:08:32.58±0.1	221/05:08:32.7	152.9±0.1	500.0 H_z	524.5 H_z±0.1



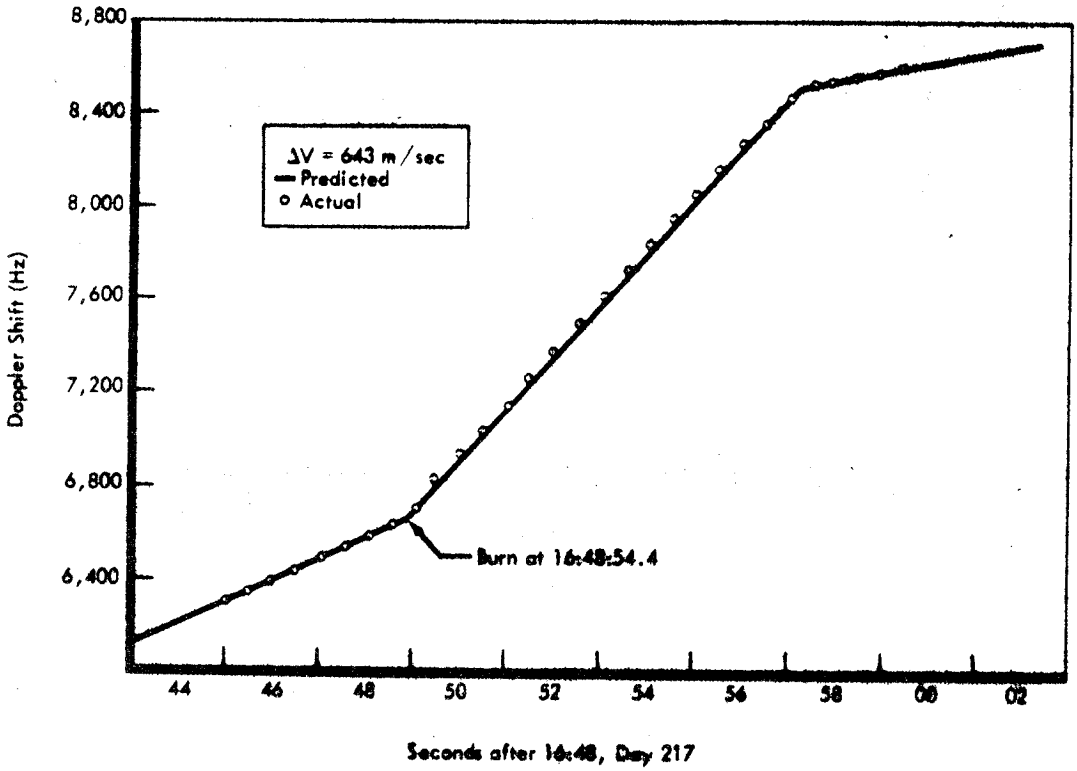
MIDCOURSE ENGINE IGNITION



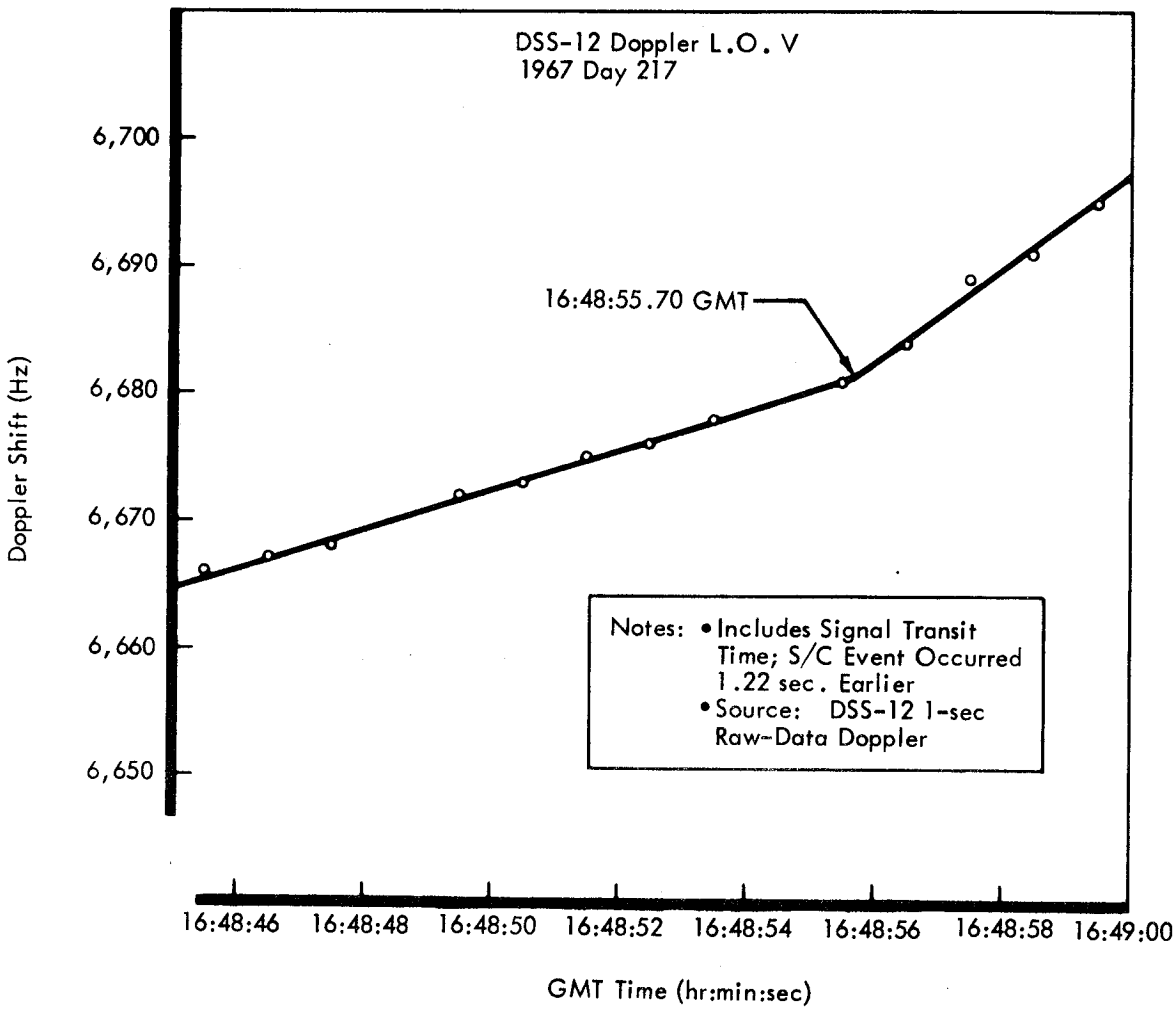
MIDCOURSE ENGINE SHUTDOWN



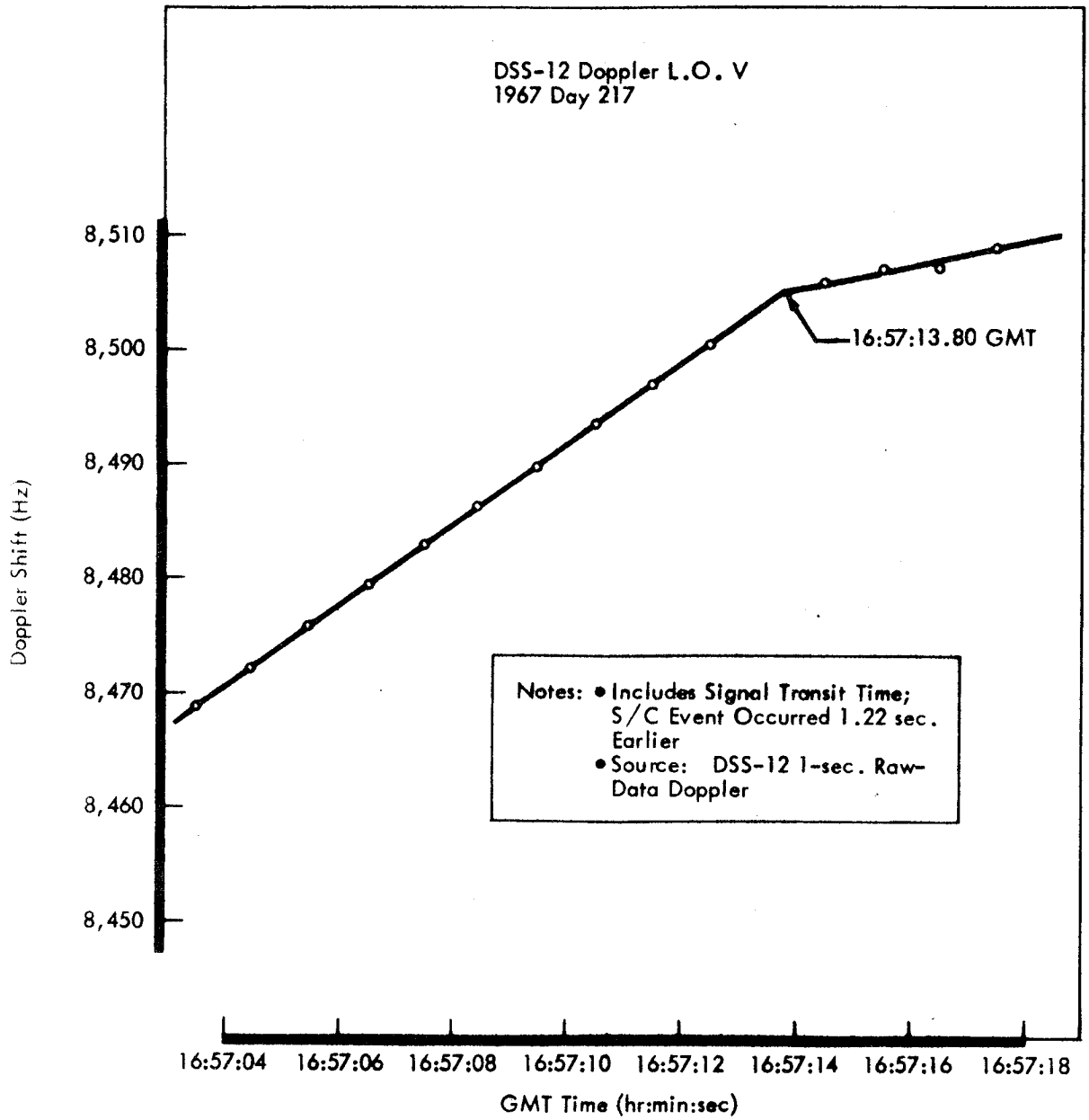
L.O. V MIDCOURSE DOPPLER SHIFT DSS-41



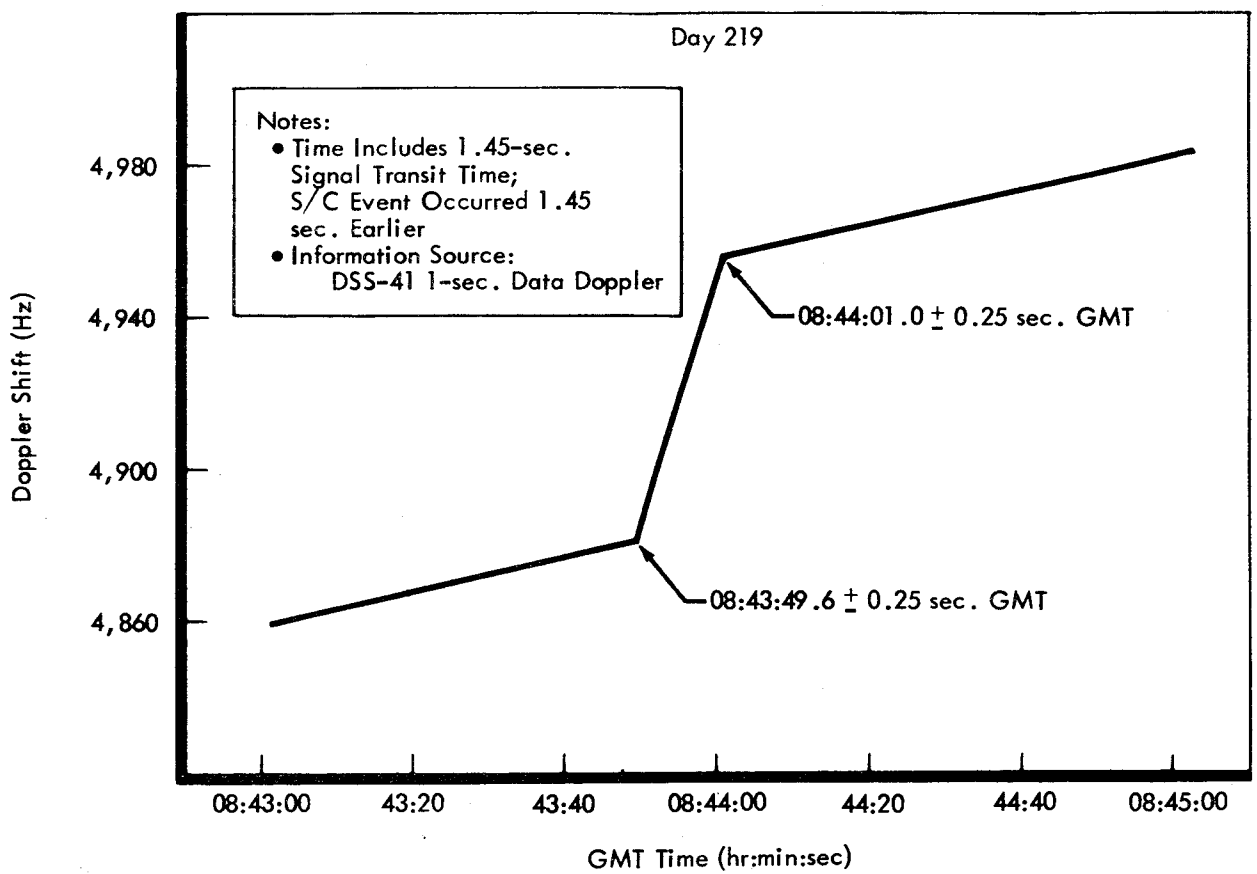
PREDICTED DOPPLER SHIFT
FIRST ELLIPSE INJECTION



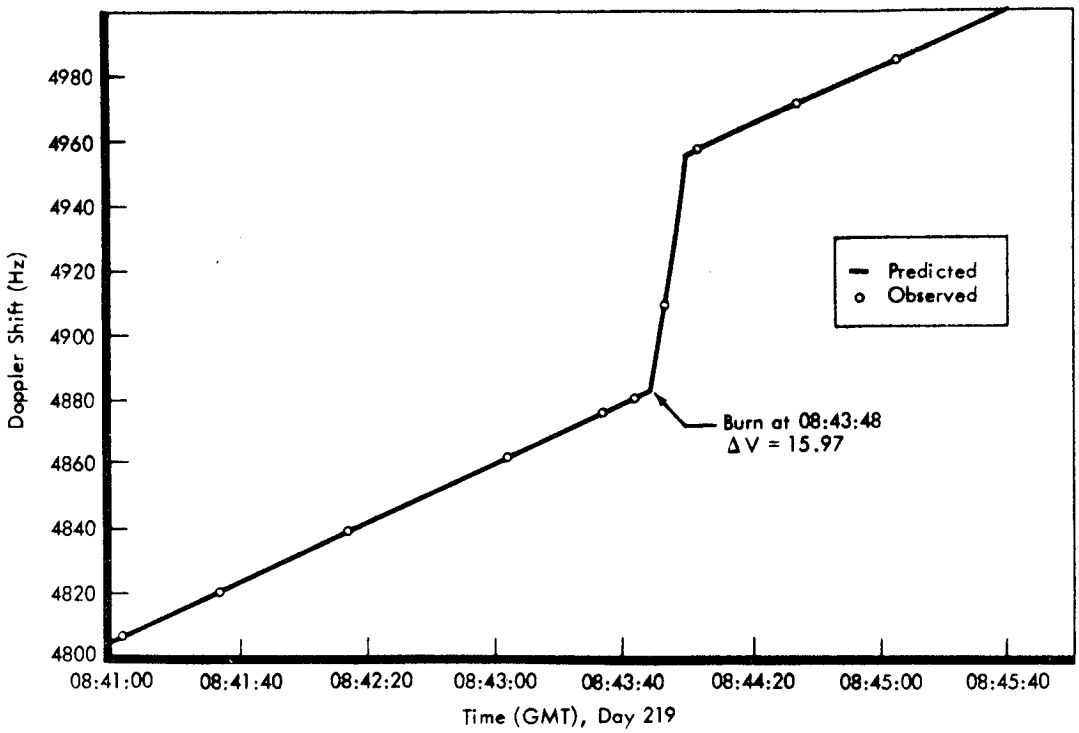
ENGINE IGNITION—FIRST-ELLIPSE INJECTION



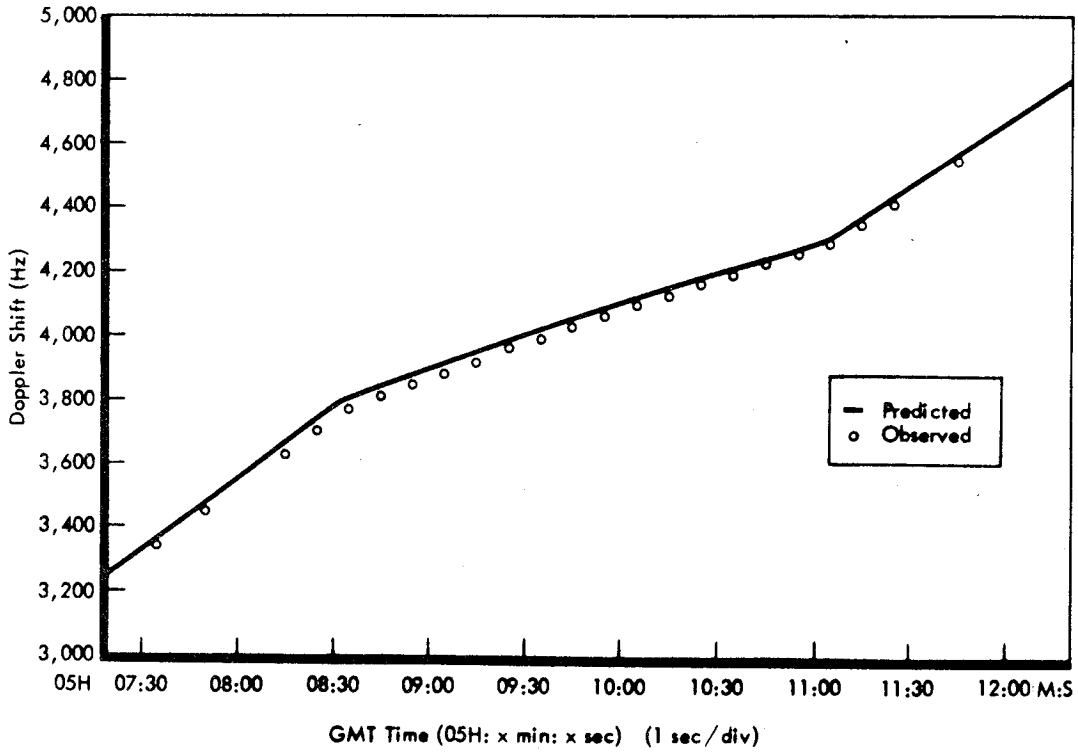
ENGINE SHUTDOWN—FIRST-ELLIPSE INJECTION



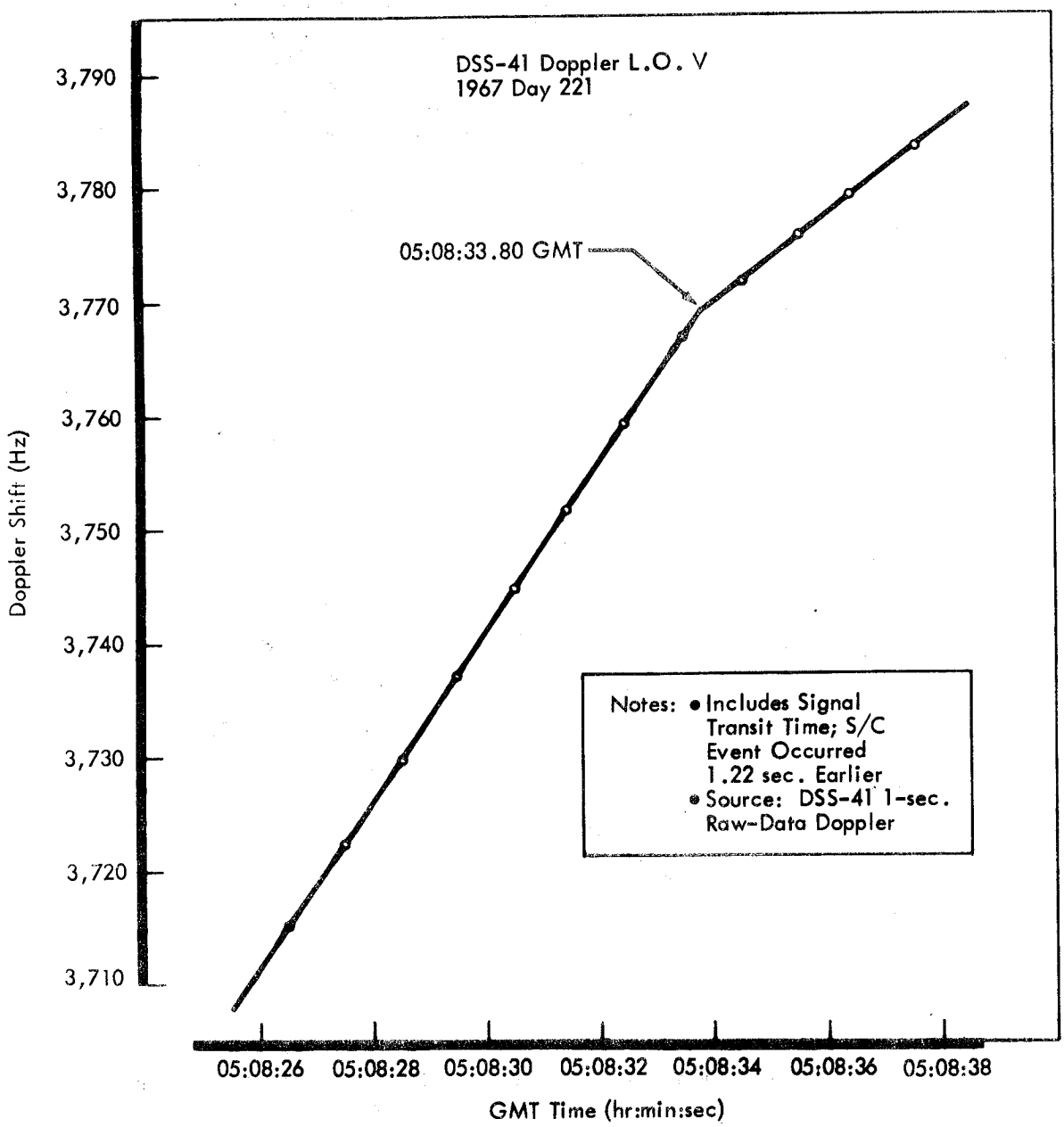
FIRST TRANSFER ENGINE IGNITION



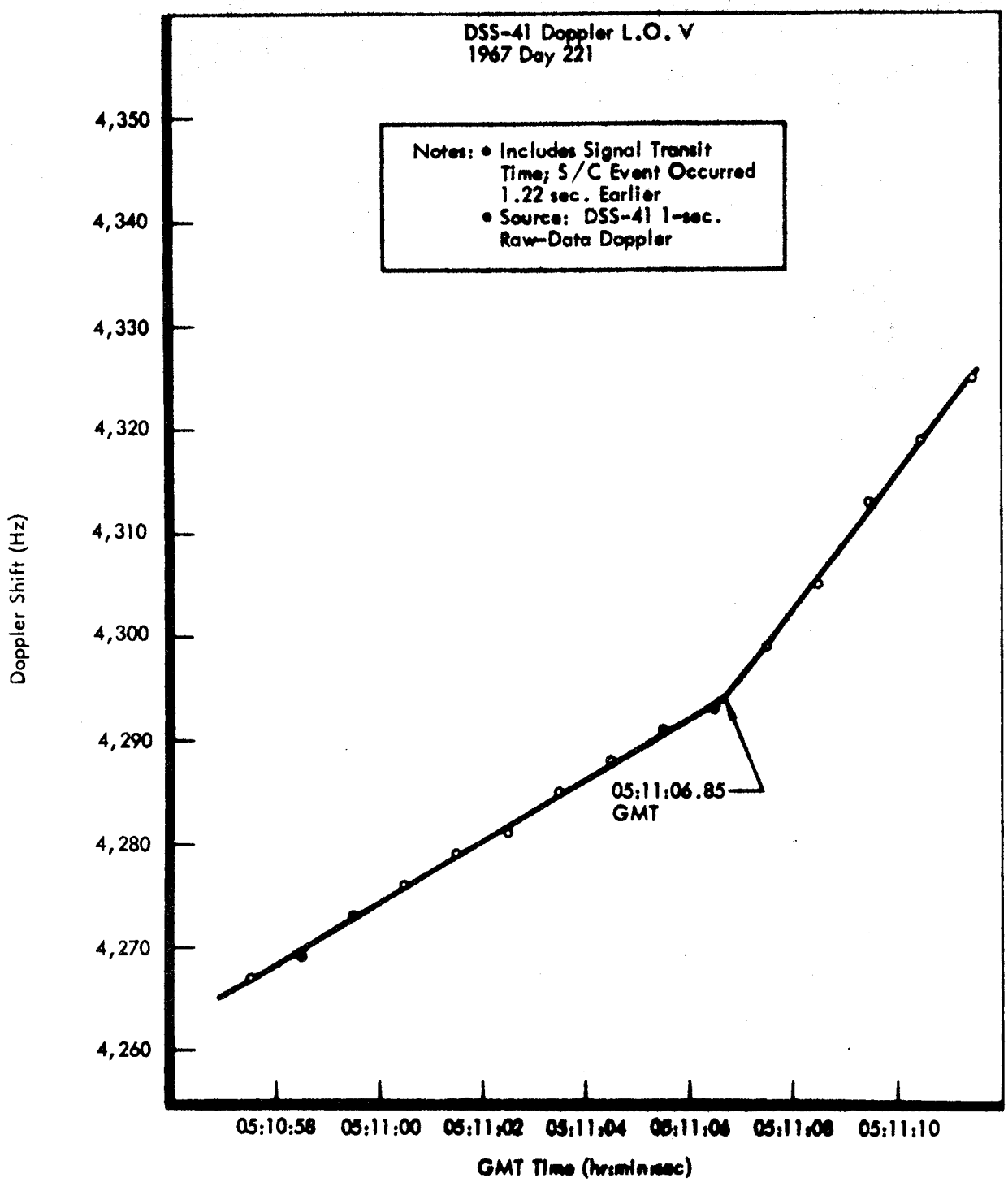
TRANSFER INTO 2ND ELLIPSE DOPPLER PREDICTS



2ND TRANSFER DOPPLER SHIFT — STATION 41



SECOND TRANSFER ENGINE IGNITION



SECOND TRANSFER ENGINE SHUTDOWN

ODPL RUNS USED FOR VELOCITY MANEUVER DESIGN

Maneuver	Preliminary Command Conference ODPL	Final Command Conference ODPL
Midcourse	1108	1210
Deboost	2126	2228
First Transfer	4312	4118
Second Transfer	5214	5122

SUMMARY – PHOTO MANEUVERS AND CAMERA-ON TIME RECOMMENDED BY FPAC

This section contains the maneuver, camera-on time, and return maneuver recommended by FPAC for each photo site. All farside photos were specified by a two-axis roll-pitch maneuver, with a reverse (i.e., pitch-roll) return sequence. All near-vertical, and convergent telephoto stereo, nearside photos were specified by a three-axis roll-pitch-yaw maneuver and a yaw-roll-pitch return maneuver. The westerly oblique and conventional oblique photos were specified by a three-axis roll-yaw-pitch maneuver with a pitch-roll-pitch return maneuver.

Photo Maneuvers Recommended by FPAC

Photo	Orbit No.	Maneuver (deg)			Camera-on Time (GMT)			Return Maneuver (deg)		
		Roll	Pitch	Yaw	Day	Hr-Min	Sec	Yaw	Roll	Pitch
A-1	2	67.37	-176.95		218	11 22	03.3	*		
A-2	2	20.34	167.84		218	13 33	25.72	*		
A-3	3	-31.39	170.00		218	17 17	06.28	*		
A-4	4	-20.48	163.78		219	00 34	59.68	*		
A-6	5	34.01	171.09		219	13 50	51.37	*		
A-7.1	6	67.53	-176.44		219	20 50	19.723	*		
A-8	7	-19.99	164.62		220	01 42	5.223	*		
A-9	8	-166.62	-38.49		220	09 05	0.0	*		
A-10	8	34.30	172.11		220	14 52	19.88	*		
A-11.2	9	67.88	-176.97		220	21 51	31.45	*		
A-12	10	-19.30	165.64		221	02 43	34.80	*		
A-13	11	36.58	160.13		221	09 32	18.73	*		
A-14	13	32.65	160.03		221	15 57	40.68	*		
V-1	15	50.55	-8.85	-71.00	221	20 57	43.76	81.32	-49.78	13.39
V-2.1	17	48.09	-16.80	-68.83	222	03 22	00.77	86.46	-45.51	24.00
V-3.1	19	96.00	-67.73	-7.90	222	09 49	36.20	-8.13	-95.88	66.50
A-15	19	47.69	159.72		222	10 52	51.43	*		
V-4	20	54.48	-1.09	-72.72	222	12 51	49.71	73.91	-54.47	1.42
V-5.1	21	96.15	-62.78	-13.85	222	16 11	29.45	-14.12	-95.87	60.91
V-6	23	94.84	-67.37	-16.89	222	22 34	08.90	-17.31	-94.51	65.57
A-16.1	25	-39.33	159.89		223	03 58	21.18	*		
V-8 a	26	31.90	-22.02	-73.76	223	08 07	24.67	86.79	-29.37	25.30
V-8b	27	26.67	5.17	-84.94	223	11 18	34.66	82.26	-26.54	-5.93

Photo	Orbit No.	Maneuver (deg)			Camera-on Time (GMT)			Return Maneuver (deg)		
		Roll	Pitch	Yaw	Day	Hr-Min	Sec	Yaw	Roll	Pitch
V-9.1	28	92.86	-68.63	-16.61	223	14 30	49.94	-16.80	-92.62	67.44
A-17.1	29	45.25	164.52		223	18 40	05.67	*		
V-10	30	68.54	-71.47	-33.56	223	20 45	36.83	-35.60	-72.09	83.49
V-11a	31	29.54	-25.47	-73.58	224	00 04	00.69	87.18	-26.47	28.54
V-11b	32	24.14	2.94	-85.32	224	03 15	8.7	83.93	-24.10	-3.35
V-12	33	26.28	9.84	-87.12	224	06 25	30.94	82.21	-25.85	-11.10
V-13	34	94.34	-67.89	-17.99	224	09 36	52.73	-18.22	-94.00	66.17
A-18.1	35	-38.46	160.22		224	11 49	22.47	*		
V-14	35	9.26	-20.88	-83.41	224	12 54	03.72	86.72	-8.66	-21.08
V-15.1	36	16.31	-30.76	-77.19	224	16 03	50.95	85.67	-13.99	31.72
V-16a	37	30.03	-20.13	-75.69	224	19 10	5.15	86.85	-28.06	22.78
V-16b	38	25.71	7.22	-86.51	224	22 21	09.42	82.97	-25.48	-8.14
A-19	39	48.25	162.62		225	02 34	32.10	*		
V-18	41	25.25	-4.12	-83.00	225	07 54	54.21	84.86	-25.18	4.41
V-19	42	43.59	-14.22	-73.27	225	11 00	59.73	86.25	-41.99	19.00
A-20	44	48.30	163.19		225	18 29	39.86	*		
V-21	45	-6.16	-20.53	-88.82	225	20 49	39.86	86.66	5.77	20.67
V-22	46	12.01	-27.43	-79.78	225	23 55	32.71	85.35	-10.65	27.89
V-23.2	47	27.81	-34.36	-70.84	226	03 02	51.15	87.35	-22.70	37.56
V-24	48	35.53	-19.23	-74.24	226	06 10	11.99	87.36	-33.33	23.00
V-25	49	85.86	-119.34	-23.22	226	09 38	23.24	-23.43	-86.05	120.64
A-21	49	48.29	164.14		226	10 24	50.70	*		
V-26.1	50	6.58	-23.28	-83.09	226	12 40	40.43	85.69	-6.05	23.38

Photo	Orbit No.	Maneuver (deg)			Camera-on Time (GMT)			Return Maneuver (deg)		
		Roll	Pitch	Yaw	Day	Hr-Min	Sec	Yaw	Roll	Pitch
V-27a	51	32.21	-24.57	-73.30	226	15 44	48.04	87.88	-29.04	28.20
V-27b	52	26.78	3.13	-84.93	226	18 55	52.61	83.26	-26.74	-3.65
V-28	53	39.31	0.80	-80.42	226	22 02	48.50	79.60	-39.30	-1.28
V-29	54	16.93	-5.74	-85.11	227	01 21	30.97	86.81	-16.85	5.91
A-22	54	48.27	165.05		227	02 20	06.91	*		
V-30	55	66.73	-4.42	-71.51	227	04 16	10.77	81.02	-66.39	10.30
V-31	56	-16.18	13.23	-93.26	227	07 54	35.37	89.48	15.74	13.83
V-32	57	20.10	-27.03	-76.74	227	10 54	20.11	86.13	-17.85	28.41
V-33	59	27.46	-27.55	-73.94	227	17 14	50.29	87.38	-24.18	30.31
V-34	60	36.49	-12.25	-76.81	227	20 21	48.99	85.59	-35.56	14.90
V-35	61	15.77	-8.36	-84.57	227	23 38	46.58	86.88	-15.61	8.60
V-36	62	21.98	-0.68	-85.18	228	02 47	55.30	85.39	-21.98	0.61
V-37	63	19.90	-10.41	-82.40	228	05 59	41.99	86.09	-19.57	10.95
A-23	64	48.33	166.72		228	10 10	8.62	*		
V-38	65	0.015	-17.43	-86.34	228	12 28	20.95	86.34	-0.01	17.43
A-24	67	48.40	167.08		228	19 43	01.42	*		
V-40	69	18.30	-15.39	-81.22	229	01 06	28.73	86.19	-17.64	16.07
V-41	70	59.77	-14.29	-69.82	229	04 04	45.94	92.41	-56.96	26.34
V-42a	71	35.17	-19.12	-74.78	229	07 23	37.04	87.66	-33.01	22.78
V-42b	72	30.74	4.52	-84.51	229	10 34	37.27	82.13	-30.92	-3.17
V-43.2	73	44.03	-4.11	-77.95	229	13 41	8.83	81.70	-43.90	5.41
A-25	74	52.36	169.75		229	17 56	45.31	*		
V-45.1	76	-2.29	-21.18	-85.23	229	23 29	52.50	84.40	2.14	21.21

Photo	Orbit No.	Maneuver (deg)			Camera-on Time (GMT)			Return Maneuver (deg)		
		Roll	Pitch	Yaw	Day	Hr-Min	Sec	Yaw	Roll	Pitch
V-46	77	5.44	-15.76	-84.52	230	02 38	01.23	86.00	-5.24	15.80
V-48	79	9.13	-14.27	-83.70	230	08 58	47.19	85.95	-8.85	14.40
V-49	80	8.21	-20.26	-82.00	230	12 10	29.67	84.84	-7.71	20.41
V-50	82	5.56	-20.11	-82.83	230	18 33	10.67	84.74	-5.22	20.17
V-51	83	19.81	-22.17	-77.88	230	21 39	45.74	85.57	-18.32	23.31

*Reverse Maneuver Sequence

SUMMARY OF COMMAND CONFERENCE UPDATES FOR MISSION V PHOTO SITES

The following table tabulates the changes in camera-on time (COT) and maneuver angles between the preliminary and final command conferences for each photo site in the final ellipse. In addition, the OD, its data arc length, and the time its state was forwarded (the time from the end of the data arc to COT) are tabulated for each command conference.

In an attempt to further refine the COT, updates based on OD's later than those for the final command conferences were performed for most sites following V-5.1. No attempt has been made to include the effect of these updates on the COT, and no updates of maneuver angles were performed during Mission V.

The changes shown were obtained by subtracting the value shown in the PCC from that of the FCC.

Map No.	Photo Site	ΔCOT (sec)	ΔHRoll (deg)	ΔYaw (deg)	ΔPitch (deg)	Preliminary C.C. OD	Preliminary C.C. Length of Data Arc Hrs Min	Preliminary C.C. Time Forwarded Hrs Min	Final C.C. OD	Final C.C. Length of Data Arc Hrs Min	Final C.C. Time Forwarded Hrs Min
14	A-14	−.46	+0.02	– –	−0.07	Used Predicted Post-Transfer State			6204	3 10 #41 Only	7 37
	V-1	12.01	0.0	+0.02	−0.09						12 37
15	V-2.1	−16.2	+0.63	+0.7	−1.61	6308	4 0	16 03	6312	9 10	10 53
16	V-3.1	0.3	+0.01	+0.20	+0.20	6312* Mapped from V-2.1 with 11/11 Harm.	9 10	17 21 /6 32 +	6114	13 0	13 10
	A-15	2.1	0.0	– –	0.0			18 23 /7 35			14 33
	V-4	4.67	−0.05	+0.02	+0.09			20 22 /9 34			16 32
17	V-5.1	−8.23	+0.01	+0.16	−0.04	6114	13 0	19 52	6116	12 55	18 49
18	V-6	−9.5	−0.01	−0.05	−0.04	6116	12 55	19 55	6218	13 0	13 33
	A-16.1	−33.2	+0.17	– –	+0.49			25 19			14 59
19	V-8a	−16.47	−0.38	−0.72	0.94	6116	12 55	29 29	6320	12 45	13 43
	V-8b	−19.49	−0.07	−0.55	+0.78			32 40			16 54
20	V-9.1	−5.70	+0.03	−0.55	+0.04	6218	13 0	29 30	6122	12 50	15 15
	A-17.1	Site Location Changed									
21	V-10	−1.28	Frame Orientation Changed			6320	12 45	26 21	6124	12 45	13 36
	V-11a	−3.36	−0.09	−0.26	+0.18			29 40			16 55
22	V-11b	−11.39	−0.08	−0.27	−0.06						13 46
	V-12	−8.49	+0.05	−0.39	+0.27	6122	12 50	26 16 29 41	6226	13 0	16 56
23	V-13	−13.0	+0.18	+0.82	−0.07			29 17			13 43
	A-18.1	−24.12	+0.07		+0.21	6124	12 45	31 29	6328	12 45	15 55
	V-14	−14.6	+0.02	−0.10	−0.39			32 34			17 00

						Preliminary C.C.			Final C.C.		
Map No.	Photo Site	ΔCOT± (sec)	ΔHRoll (deg)	ΔYaw (deg)	ΔPitch (deg)	OD	Length of Data Arc Hrs Min	Time Forwarded Hrs Min	OD	Length of Data Arc Hrs Min	Time Forwarded Hrs Min
24	V-15.1	+3.0	+0.32	+0.64	−1.06	6226	13 00	26 35	6330	12 45	13 52
	V-16a	+3.4	+0.23	+0.51	−0.79			29 41			16 58
25	V-166b	−0.6	−0.05	−0.16	+0.57	6328	12 45	26 27	6132	12 55	13 42
	A-19	−4.3	−0.02		+0.07			30 40			17 55
26	V-18	−6.53	+0.04	−0.15	−0.38	6132	12 55	23 16	6236	13 0	13 26
	V-19	−7.87	+0.06	+0.11	−0.18			26 22			16 32
27	A-20	−14.73	+0.03		−0.17	6132	12 55	33 51	6340	12 50	14 40
	V-21	−4.94	−0.03	0.0	−0.35			36 10			17 00
28	V-22	+4.18**	+0.02	+0.17	−0.11	6236	13 0	29 26	6142	12 55	13 37
	V-23.2	+4.40**	−0.15	−0.12	+0.39			32 34			16 45
29	V-24	−1.10	-0.33	−0.53	+1.06	6340	12 50	26 21	6144	12 55	14 48
	V-25	−2.90	+0.20	−0.23	−0.30			29 49			18 16
	A-21	−2.49	-0.01		+0.07			30 36			19 08
30	V-26.1	−27.84	−0.16	−0.43	+1.01	6142	12 55	26 23	6246	13 0	13 38
	V-27a	−7.86	−0.34	−0.57	+0.95			29 27			16 42
31	V-27b	−4.50	−0.14	−0.51	+1.49	6144	12 55	27 34	6348	12 50	13 37
	V-28	+4.77	−0.14	−0.14	+0.26			30 41			16 44
	V-29	−12.66	+0.07	+0.10	−0.52	6246	13 0	26 19	6350	12 50	13 38
32	A-22	−10.81	+0.04		−0.17			27 17			14 36
	V-30	−13.93	+0.28	+0.38	−0.87			29 13			16 32
33	V-31	+1.42	−0.06	+0.03	−0.42	6348	12 50	26 36	6152	12 55	13 46
	V-32	−0.03	+0.31	+0.57	−1.36			29 35			16 45
34	V-33	−3.31	+0.08	+0.07	−0.32	6350	12 50	29 31	6256	13 0	13 26
	V-34	−5.07	+0.28	+0.41	−1.11			32 38			16 33
35	V-35	−8.13	−0.15	−0.64	+1.44	6152	12 55	29 30	6358	12 40	13 40
	V-36	−8.79	−0.12	−0.63	+1.30			32 39			16 39

						Preliminary C.C.			Final C.C.		
Map No.	Photo Site	ΔCOT± (sec)	ΔHRoll (deg)	Δ Yaw (deg)	Δ Pitch (deg)	OD	Length of Data Arc Hrs Min	Time Forwarded Hrs Min	OD	Length of Data Arc Hrs Min	Time Forwarded Hrs Min
36	V-37	−3.20	− .02	−0.29	+0.22	6256	13 0	26 11	6360	12 45	13 40
	A-23	−9.48	−0.03		+0.06			30 21			17 50
37	V-38	−6.03	−0.015	−0.64	+0.27	6358	12 40	26 28	6162	12 40	13 48
38	A-24	−5.05	+0.06		−0.26	6360	12 45	27 23	6264	13 0	14 23
39	V-40	−8.20	0.0	+0.19	0.0	6162	12 40	26 27	6266	12 55	13 31
	V-41	−9.0	+0.52	−1.46	−0.61			29 25			16 30
40	V-42a	−0.97	+0.08	0.0	−0.28	6264	13 0	26 04	6368	12 45	13 34
	V-42b	−1.96	+0.41	−0.62	−4.45			29 15			16 45
41	V-43.2	+5.35	−0.08	−0.11	+0.27	6266	12 55	26 06	6170	12 40	13 31
	A-25	+6.25	0.0		0.0			30 22			17 47
42	V-45.1	+2.61***	−0.01	+0.31	−0.37	6274	12 45	29 40	6274	13 0	13 30
	V-46	+0.13***	+2.73	+0.93	+0.25			32 40			16 38
43	V-48	−9.85	−0.05	−0.27	+0.84	6172	12 40	26 24	6378	12 45	13 39
	V-49	−12.18	−0.08	−0.29	+0.78			29 35			16 50
44	V-50	+8.38	−0.08	−0.26	+0.34	6378	12 45	22 53	6182	12 45	13 38
	V-51	+9.23	+0.06	−0.20	+0.11			26 20			16 45

For these computations the following procedure was used:

1) The FCC state vector for Map 15 (OD 6312) was available at the COT for Photo Site V-2.1.

2) This state vector was mapped from V-2.1 to the Map 16 sites using the 11/11 harmonics.

+The first time is the total distance from last data point to photo site. Second time is distance from Site V-2.1 to photo site.

Wrong mapping procedure used (i.e., mappings done with 7/28B unmodified harmonics instead of tailored set – update corrected this).

Wrong Harmonics used for OD 6274

Appendix C

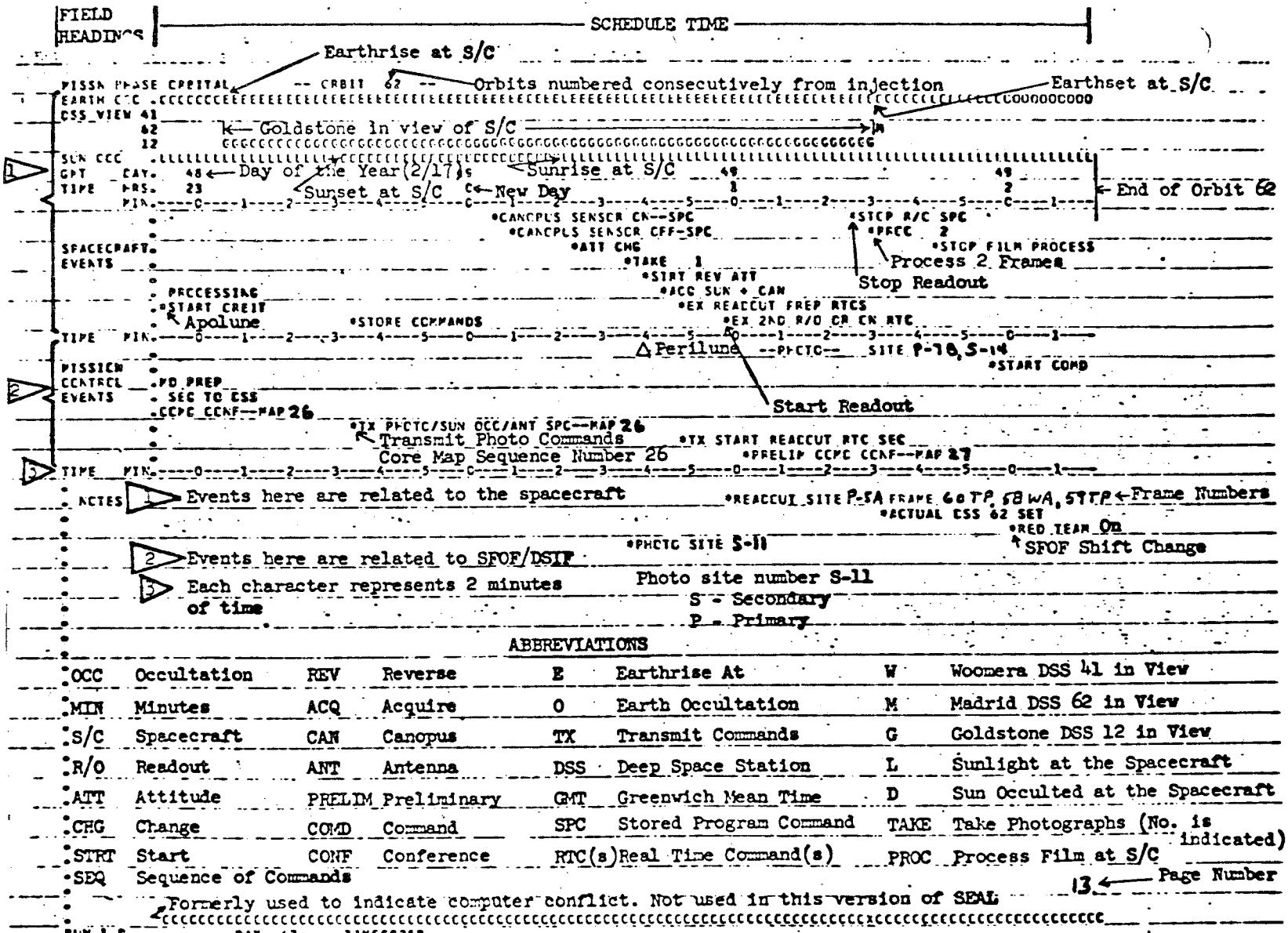
SEQUENCE OF EVENTS

Appendix C
SEQUENCE OF EVENTS

The Mission Sequence of Events program (SEAL) is a computer program designed to generate a complete, integrated schedule of operational activities and significant spacecraft events for Lunar Orbiter missions. It is included as an integral part of the flight plan for a particular mission and functions as a guide to both operational team members and team leaders. It serves as a vehicle to identify schedule conflicts and – by its graphical presentation in a time-phased bar chart format – facilitates rescheduling activities and trade-off decisions.

During flight operations, the complete mission SEAL portion of the flight plan serves as a model for segmented versions that are generated each day or two or when unscheduled events (such as the occurrence of an anomaly) necessitate a schedule change. In addition to providing up-to-date operational schedules for those team members at the SFOF site, there is also the capability to generate and transmit by teletype, using the data handling system, DSIF scripts containing all mission activities and spacecraft events of significance to the prime Deep Space Stations.

The format contains numerous symbols, abbreviations, and certain machine-generated conventions that render a verbal description difficult to present. Accordingly the following sheet, depicting an actual orbit from Lunar Orbiter Mission III, has been annotated to explain the symbology as it is presented in the machine output. In addition, a complete explanation of abbreviations used has been added in the notes section at the lower half of the page.



ABBREVIATIONS

OCC	Occultation	REV	Reverse	E	Earthrise At	W	Woomera DSS 41 in View
MIN	Minutes	ACQ	Acquire	O	Earth Occultation	M	Madrid DSS 62 in View
S/C	Spacecraft	CAN	Canopus	TX	Transmit Commands	G	Goldstone DSS 12 in View
R/O	Readout	ANT	Antenna	DSS	Deep Space Station	L	Sunlight at the Spacecraft
ATT	Attitude	PRELIM	Preliminary	GMT	Greenwich Mean Time	D	Sun Occulted at the Spacecraft
CHG	Change	COMD	Command	SPC	Stored Program Command	TAKE	Take Photographs (No. is indicated)
STRT	Start	CONF	Conference	RTC(s)	Real Time Command(s)	PROC	Process Film at S/C
SEQ	Sequence of Commands						

Formerly used to indicate computer conflict. Not used in this version of SEAL

```
MISSN PHASE  LAUNCH
EARTH CCC .EEEEEEEEEEEEEEEEE
DSS VIEW 41
         62
         12
CAN CCC   .----------------
GMT    DAY.             213
TIME   HRS.              23
       MIN.----4----5----0--
          .*LIFTOFF
          .  *BECO
SPACECRAFT.   *SECO-VECO
EVENTS    .    *AGENA ON 1
          .    *AGENA OFF
          .                 *
          .
          .
TIME   MIN.----4----5----0--
          .
MISSION   .         *ACE-2 BR
CONTROL   .
EVENTS    .
          .
          .
          .
          .
TIME   MIN.----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----4----5----0--
S/C 9     .
EVENTS    .
----------.----------------
S/C 8     .
EVENTS    .
----------.----------------
S/C 7     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCC
RUN I.D.            DAY 231
```

L.O. I

RECONSTRUCTED SEAL

9-12-67

```
MISSN PHASE  CISLUNAR
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41       WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC    .------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                      214                          214                          214                          214
TIME  HRS.                       0                            1                            2                            3
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         . *DEPLOY ANT/PANELS GSPC
         .  *PRESSURIZE N2 GSPC
SPACECRAFT.     *SWITCH TO MOD MODE 4 GSPC
EVENTS   .      *START SUN ACQ GSPC
         .                    *COMPLETE SUN ACQ GSPC
         .AGENA ON 2                    *EX SWITCH TO MOD MODE 3 RTC
         .*AGENA OFF-INJ-                    *EX PITCH PLUS X DEG RTC X = .011
         . *S/C SEP-AGENA MANEUVER                *EX SWITCH TO MOD MODE 1 RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
MISSION  .IEF RISING DSS
CONTROL  .     *PREDICTED DSS 41 RIS-                                                                                        *S/
EVENTS   .
         .
         .
         .
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.     TIM  DAY 231     TIMEC2231
```

```
MISSN PHASE  CISLUNAR
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                                                      MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC  .---------------------------------------------------------------------------------------------------------------------
GMT   DAY.                     214                        214                        214                        214
TIME  HRS.                      4                          5                          6                          7
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                                                 *RAD DCS SCINT CTR 2 ON GSPC                          *EX CANOPU
         .                                                   *EX ACQUIRE SUN RTC                                  *EX CANOP
SPACECRAFT.                                                     *CANOPUS SENSOR ON GSPC                              *EX C
EVENTS   .                                                              *EX 0.2 DEG DEAD ZONE RTC                     *EX
         .                                                                                                             *E
         .                                                                  *EX ROLL 360 RTC
         .                                                                               *EX CANOPUS SENSOR OFF RTC
         .                                                                                *EX CANOPUS SENSOR ON RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                                                                          *DSS HANDOVER PER ACE-2
MISSION  .                                                                              *DSS START TIME CODE CORRELATION
CONTROL  .                                                                                                   *PREDICTED
EVENTS   .C STATUS MSG TO RISING DSS
         .                                    *ACE-2 BRIEF RISING DSS
         .                                                   *PREDICTED DSS 62 RISE
         .                                                                 *END ROLL MANEUVER-BEGIN STAR ID
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MI .--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
---------.---------------------------------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.---------------------------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 231     TIME02231
```

```
MISSN PHASE   CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .------------------------------------------------------------------------------------------------------------------------------
GMT    DAY.                   214                            214                            214                            214
TIME   HRS.                    8                              9                              10                             11
       MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
                                                                                                            *EX ROLL X DEG RTC X=-357.
          .S SENSOR OFF RTC                                                                                        *EX CANOPUS SENSOR
          .US SENSOR ON RTC                                   *EX CANOPUS SENSOR ON RTC                              *EX ROT ANT 1 DE
SPACECRAFT.ANOPUS SENSOR OFF RTC                               *EX CANOPUS SENSOR OFF RTC                                     *EX CAN
EVENTS    .CANOPUS SENSOR ON RTC                                 *EX CANOPUS SENSOR ON RTC
          .X CANOPUS SENSOR OFF RTC                                  *EX CANOPUS SENSOR OFF RTC
          .                       *EX CANOPUS SENSOR ON RTC                          *EX CANOPUS SENSOR ON RTC
          .                         *EX CANOPUS SENSOR OFF RTC                           *EX CANOPUS SENSOR OFF RTC
          .                             *EX PROP HEATERS ON RTC                                   *EX CANOPUS SENSOR ON RTC
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
MISSION   .
CONTROL   . DSS 41 SET                                                                                                          *S/
EVENTS    .
          .
          .
          .
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIMEC2231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                                                           GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC  .------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                        214                           214                           214                           214
TIME  HRS.                         12                            13                            14                            15
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                                                                                                                *EX ROL
         . OFF RTC
SPACECRAFT.G L RTC 20 TIMES
EVENTS   .CPUS SENSOR ON RTC
         .      *EX CANOPUS SENSOR OFF RTC
         .        *EX CANOPUS SENSOR ON RTC
         .                                                                                                    *EX ARM VEL CONTROL
         .                                                                                                       *EX TWTA ON RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                                                                                                      *DSS HANDOVER PER
MISSION  .                                                                                                      *DSS START TIME CO
CONTROL  .
EVENTS   .C STATUS MSG TO RISING DSS
         .                                   *ACE-2 BRIEF RISING DSS
         .                                                  *PREDICTED DSS 12 RISE
         .                                                                                              *BLEED PROPELLANT LINES
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 2    .
EVENTS   .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXC
RUN I.D.        DAY 231     TIME02231
```

277

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMM                                                        M
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------------------------------------------------------------
GMT   DAY.                         214                        214                        214                        214
TIME  HRS.                          16                         17                         18                         19
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .L 360 RTC                                                                                            •EX C
          .    •EX CANOPUS SENSOR OFF RTC                                                                          •EX
SPACECRAFT.     •EX CANOPUS SENSOR ON RTC
EVENTS    .                                                                                 •EX POT ANT 1 DEG RT RTC
          .                                                                                ▷•EX ROLL X DEG RTC
          .                                                                                      •EX CANOPUS SENSOR
          . S/S RTCS                                                                               •EX CANOPUS SENSO
          .                                                                                           •EX ROLL 360 R
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .ACE-2
MISSION   .DE CORRELATION
CONTROL   .                    •PRELIM COMD CONF--MAP 2
EVENTS    .                       --1ST MIDCOURSE--
          .                                                                       •PREDICTED DSS 62 SET
          .
          .
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.                                                                                          ▷ X= -43.5
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                          W                  WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .------------------------------------------------------------------------------------------------------------------
GMT    DAY.                        214                          214                         214                         214
TIME   HRS.                        20                           21                          22                          23
       MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .ANCPUS SENSOR OFF RTC
          . CANOPUS SENSOR ON RTC
                                                                *EX YAW    .*11DEG
SPACECRAFT.                                                                *STORE COMMANDS
EVENTS    .                                                                            *EX CANOPUS SENSOR OFF RTC
          .
          .OFF RTC
          .R ON RTC
          .TC
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                  *FINAL COMD CONF--MAP2
MISSION   .                                     --1ST MIDCOURSE--
CONTROL   .                                                     *PREDICTED DSS 41 RISE
EVENTS    .                                                               *ACE-2 BRIEF RISING DSS
          .                                                               *TX 1ST MIDCRS SPC--MAP2
          .                       *S/C STATUS MSG TO RISING DSS                                           *DSS START TIME CO
          .                              *SEND SPC SEQ TO DSS                                                          *DS
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MI .--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW  41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGG                                G
CAN OCC   .--------------------------------------------------------------------------------------------------
GMT   DAY.                          215                          215                          215                         215
TIME  HRS.                           0                            1                            2                           3
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                                                                *EX CANOPUS SENSOR ON RTC
          .
SPACECRAFT.
EVENTS    .
          .
          .   *EX PROP HEATERS OFF RTC
          .                         *EX CANOPUS SENSOR ON RTC
          .                              *EX CANOPUS SENSOR OFF RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                                     *PREDICTED DSS 12 SET
MISSION   .
CONTROL   .
EVENTS    .
          .
          .CE CORRELATION
          .S HANDOVER PER ACE-2
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIME02231
```

MISSN PHASE CISLUNAR

EARTH OCC

DSS VIEW 41

62
12

CAN OCC

GMT DAY. 215 215 215 215

TIME HRS. 4 5 5 7

MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

SPACECRAFT EVENTS

*EX ACQUIRE SUN RTC

*EX ROLL X DEG RTC X= -29.

*EX ROLL UPDATE RTC

*EX PROP HEATERS ON RTC

*EX TWTA OFF RTC

*START ATT CHANGE ▷ X PITCH PLUS X DEG RTC

*EX THRUST-REV ATT

*EX JUMP TO LOC 137

*ACQ SUN

*PITCH OFF-SUN

*EX CANOPUS SENSOR OFF RTC

*EX CANOPUS SENSOR ON RTC

*START THRUST *EX CANOPUS SENSO

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

MISSION CONTROL EVENTS

*S/C STATUS MSG TO RISING DSS

*ACE-2 BRIEF RISING DSS

*PREDICTED DSS 62 RISE

*TX JUMP RTC

*DSS HANDOVER PER ACE

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

FPAC EVENTS

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

NOTES

*1ST MIDCOURSE MANEUVER

▷ X= .011

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

S/C 5 EVENTS

S/C 6 EVENTS

S/C 7 EVENTS

RUN I.D. DAY 231 TIME02231

MISSN PHASE CISLUNAR

EARTH CCC

DSS VISB 41

CAN CCC

GMT DAY 215 215 215 215

TIME HRS 5 3 12 11

MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----0----1----4----5----0--

SPACECRAFT EVENTS

*EX CANOPUS SENSOR ON RTC

*EX CANOPUS SENSOR OFF RTC

.P OFF RTC

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----0----1----4----5----0--

MISSION CONTROL EVENTS

*END CAT 1 COMPUTER SUPPORT

-2

*PREDICTED DSS 41 SET

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----0----1----4----5----0--

EPAC EVENTS

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----0----1----4----5----0--

NOTES

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----0----1----4----5----0--

S/C 9 EVENTS

S/C 2 EVENTS

S/C 5 EVENTS

RUN I.D. DAY 231 TIME2231

```
MISSN PHAS:  CISLUNAR
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
            62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
            12                                                                    G                GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .---------------------------------------------------------------------------------------------------------------------
GMT   DAY.                      215                     215                     215                     215
TIME  HRS.                      12                      13                      14                      15
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
           .
           .
SPACECRAFT.                                *EX CANOPUS SENSOR ON RTC
EVENTS     .                                   *EX CANOPUS SENSOR OFF RTC
           .
           .
           .
           .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
MISSION    .                       *S/C STATUS MSG TO RISING DSS
CONTROL    .                                                                *PREDICTED DSS 12 RISE
EVENTS     .                                                                 *ACE-2 BRIEF RISING DSS
           .                                                                                                     *DS
           .
           .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
           .
FPAC       .
EVENTS     .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9      .
EVENTS     .
-----------.---------------------------------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
-----------.---------------------------------------------------------------------------------------------------------------------
S/C ?      .
EVENTS     .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 231      TIME 02231
```

282

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM                                                    M
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                       215                          215                          215                          215
TIME  HRS.                       16                           17                           18                           19
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
          .
SPACECRAFT.
EVENTS    .
          .  *EX CANOPUS SENSOR ON RTC
          .       *EX CANOPUS SENSOR OFF RTC
          .                                                                                               *EX CANOPUS SENSOR ON RTC
          .                                                                                                    *EX CANOPUS SENSOR OFF
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
MISSION   .
CONTROL   .
EVENTS    .
          .S START TIME CODE CORRELATION
          .             *DSS HANDOVER PER ACE-2
          .
          .                                                                                                         *PREDICTED D
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------------------------------
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------------------------------
S/C       .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 231     TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                                     W          WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .-----------------------------------------------------------------------------------------------------------------------------
GMT    DAY.                        215                          215                          215                          215
TIME   HRS.                        20                           21                           22                           23
       MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                                          *EX CANOPUS SENSOR ON RTC
          .                                                               *EX CANOPUS SENSOR OFF RTC
SPACECRAFT.
EVENTS    .
          .
          .
          .
          .RTC
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                            *S/C STATUS MSG TO RISING DSS
MISSION   .                                                                   *ACE-2 BRIEF RISING DSS
CONTROL   .                                                                      *PREDICTED DSS 41 RISE
EVENTS    .                                                                                                                *DS
          .
          .
          .SS 62 SET
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 3     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231     TIME02231
```

MISSN PHASE CISLUNAR

EARTH CCC

DSS VIEW

CAN CCC

GMT DAY. 216 216 216 216

TIME HRS. 0 1 2 3

MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

SPACECRAFT. *EX CANOPUS SENSOR ON RTC

EVENTS *EX CANOPUS SENSOR OFF RTC

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

MISSION

CONTROL

EVENTS S HANDOVER PER ACE-2

*PREDICTED DSS 12 SET

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

FPAC

EVENTS

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

NOTES

TIME MIN. --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

S/C 9

EVENTS

S/C 8

EVENTS

S/C 9

EVENTS

RUN I.D. DAY 231 TIME02231

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
                                                                                  M                         MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         62
         12
CAN OCC  .-----------------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                            216                           216                           216                           216
TIME  HRS.                             4                             5                             6                             7
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
         .
SPACECRAFT.
EVENTS   .
         .  *EX CANOPUS SENSOR ON RTC
         .       *EX CANOPUS SENSOR OFF RTC
         .                                                                                          *EX CANOPUS SENSOR ON RTC
         .                                                                                               *EX CANOPUS SENSOR OFF
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                                                                      *ACE-2 BRIEF RISING DSS
         .                                                                                                            *DSS HANDO
MISSION  .
CONTROL  .
EVENTS   .
         .
         .                           *S/C STATUS MSG TO RISING DSS
         .                                                           *PREDICTED DSS 62 RISE
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------------------------------------
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIM 02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWW
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                      216                         216                         216                         216
TIME  HRS.                        8                           9                          10                          11
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                                        *EX CANOPUS SENSOR ON RTC
          .                                                             *EX CANOPUS SENSOR OFF RTC
SPACECRAFT.
EVENTS    .
          .
          .
          .
          .RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
MISSION   .VER PER ACE-2
CONTROL   .             *PREDICTED DSS 41 SET
EVENTS    .
          .
          .
          .
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIMEC2231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          42MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                                 G GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC  .---------------------------------------------------------------------------------------------------------
GMT   DAY.                216                   216                   216                   216
TIME  HRS.                 12                    13                    14                    15
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---- ----0----1----2----3----4----5----0--
         .
         .
SPACECRAFT.                          *EX CANOPUS SENSOR ON RTC
EVENTS   .                            *EX ACQUIRE SUN RTC
         .                              *EX CANOPUS SENSOR OFF RTC
         .
         .
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---- ----0----1----2----3----4----5----0--
         .
MISSION  .
CONTROL  .
EVENTS   .          *S/C STATUS MSG TO RISING DSS
         .                  *PRELIM COMD CONF, FLY-BY SEQ MAP 3
         .                                            *ACE-2 BRIEF RISING DSS
         .                                                     *PREDICTED DSS 12 RISE
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---- ----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---- ----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---- ----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
---------.---------------------------------------------------------------------------------------------------------
S/C 9    .
EVENTS   .
---------.---------------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.C.          DAY 231     TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM                 9
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------------------------------------------------------------------
GMT   DAY.                                216                        216                        216                        216
TIME  HRS.                                 16                         17                         18                         17
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----------0----1----2----3----4----5----0--
          .                                                                                          *EX CANOPUS SENSOR OFF
          .
SPACECRAFT.
EVENTS    .
          .
          .  *EX CANOPUS SENSOR ON RTC
          .      *EX CANOPUS SENSOR OFF RTC
          .                                                                                      *EX CANOPUS SENSOR ON RTC
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----------0----1----2----3----4----5----0--
          .                    *DSS MANEUVER PER ACE-2
MISSION   .                        *FINAL COMD CONF, FLY-BY SEQ MAP 3
CONTROL   .                                                        *SEND FLY-BY COMDS TO DSS
EVENTS    .                                                                                                                 *PR
          .
          .
          .
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----------0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----------0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----------0----1----2----3----4----5----0--
S/C 2     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231     TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                                                          W      WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                      216                         216                         216                         216
TIME  HRS.                      20                          21                          22                          23
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
           .RTC
           .                                                           *EX CANOPUS SENSOR ON RTC
SPACECRAFT.                                                                 *EX CANOPUS SENSOR OFF RTC
EVENTS     .
           .
           .
           .
           .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
           .                                                                         *PREDICTED DSS 41 RISE
MISSION    .                                                                                                                  *DS
CONTROL    .
EVENTS     .EDICTED DSS 62 SET
           .                          *S/C STATUS MSG TO RISING DSS
           .                                                *START CAT 1 CCMPUTER SUPPORT
           .                                                                     *ACE-2 BRIEF RISI?G DSS
           .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
           .
FPAC       .
EVENTS     .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9      .
EVENTS     .
----------.-----------------------------------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.-----------------------------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 231     TIME02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGG                                          G
CAN OCC   .----------------------------------------------------------------------------------------------------------------------------
GMT    DAY.                      217                           217                           217                           217
TIME   HRS.                       0                             1                             2                             3
       MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
          .
SPACECRAFT.
EVENTS    .                                  *EX CANOPUS SENSOR ON RTC
          .                                       *EX CANOPUS SENSOR OFF RTC
          .
          .
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
MISSION   .S HANDOVER PER ACE-2
CONTROL   .                                         *PRELIM COMD CONF--MAP 4
EVENTS    .                                            --INJECTION--
          .                                                                      *PREDICTED DSS 12 SET
          .
          .
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----  ----0----1----2----3----4----5---- --
S/C 9  .  .
EVENTS    .
----------.----------------------------------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231      TIME02231
```

MISSN PHASE CISLUNAR
EARTH OCC
DSS VIEW
CAN OCC
GMT DAY 217 217 217 217
TIME HRS 4 5 6 7
MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

SPACECRAFT EVENTS

*EX CANOPUS SENSOR ON RTC
*EX CANOPUS SENSOR OFF RTC
*STORE COMMANDS

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

*FINAL COMD CONF--MAP 4
--INJECTION--
*PREDICTED DSS 62 RIS

MISSION CONTROL EVENTS

*ACE-2 BRIEF RISING DSS
*TX INJECTION SPC--MAP 4
*S/C STATUS MSG TO RISING DSS
*SEND SPC SEQ TO DSS
*D

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

FPAC EVENTS

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

NOTES

TIME MIN --1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--

S/C 6 EVENTS

S/C 8 EVENTS

S/C 5 EVENTS

RUN I.D. DAY 231 TIMF02231

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                                                                                G     GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC  .------------------------------------------------------------------------------------------------------------------------
GMT   DAY.                     217                        217                        217                        217
TIME  HRS.                     12                         13                         14                         15
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         . ON RTC
         .R OFF RTC
SPACECRAFT.         *EX CANOPUS SENSOR ON RTC
EVENTS   .           *EX CANOPUS SENSOR OFF RTC
         .                  *EX ROLL UPDATE RTC
         .                                      *EX CANOPUS SENSOR ON RTC
         .
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .                     *S/C STATUS MSG TO RISING DSS
MISSION  .                                                          *ACE-2 BRIEF RISING DSS
CONTROL  .                                                                   *PREDICTED DSS 12 RISE
EVENTS   .
         .
         .
         .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
         .
FPAC     .
EVENTS   .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9    .
EVENTS   .
---------.------------------------------------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.------------------------------------------------------------------------------------------------------------------------
S/C 6    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 231     TIM-02231
```

```
MISSN PHASE  CISLUNAR
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                                          G     GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------------------------------------------------------------------------------
GMT    DAY.                    217                      217                      217                      217
TIME   HRS.                     12                       13                       14                       15
       MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          . ON RTC
          .R OFF RTC
SPACECRAFT.            *EX CANOPUS SENSOR ON RTC
EVENTS    .             *EX CANOPUS SENSOR OFF RTC
          .                    *EX ROLL UPDATE RTC
          .                                       *EX CANOPUS SENSOR ON RTC
          .
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                      *S/C STATUS MSG TO RISING DSS
MISSION   .                                                                   *ACE-2 BRIEF RISING DSS
CONTROL   .                                                                            *PREDICTED DSS 12 RISE
EVENTS    .
          .
          .
          .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------------------------------------
S/C 7     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 231     TIM-02231
```

```
MISSN PHASE  CISLUNAR
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .------------------------------------------------------------
GMT    DAY.                          217
TIME   HRS.                           16
       MIN.--1----2----3----4----5----0----1----2----3----4----5--
           .                                      *EX CANOPUS SENSOR
           .                                          *START ATT CHAN
SPACECRAFT.                                                   *STAR
EVENTS     .
           .
           .
           .     *EX ROT ANT 1 DEG RT RTC 3 TIMES
           .                         *EX SWITCH TO MOD MODE 3 RTC
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5--
           .
MISSION    .
CONTROL    .
EVENTS     .                                *TX JUMP RTC
           .                                     *DSS HANDOVER PE
           .
           .
           .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5--
           .
FPAC       .
EVENTS     .
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--1----2----3----4----5----0----1----2----3----4----5--
S/C 9      .
EVENTS     .
----------.------------------------------------------------------
S/C 8      .
EVENTS     .
----------.------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.            DAY 231      TIMEC2231
```

```
MISSN PHASE  PARTIAL ORBITS
EARTH CCC .EEEEEEEEEEEECCCCCOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMM         MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM                M
         12GGGGGGGGGGGGG        GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .-------------------------CCCCCCCCCCCCCCCCCCCCCCCCCC----------------------------------------------------------------
GMT     DAY.217                          217                          217                          217
TIME    HRS. 17                           18                           19                           20
        MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .OFF RTC *EX CANOPUS SENSOR OFF RTC                              *EX FINE S/S OFF RTC Y+P
          .GE                        *EX TWTA ON RTC
SPACECRAFT.T THRUST                  *EX PITCH PLUS X DEG RTC x=40.
EVENTS    .*END THRUST-REV ATT             *EX SOLAR ECLIPSE OFF
          .*EX JUMP TO LOC 137                ▷*EX READOUT PREP RTCS
          .     *ACQ SUN                             *EX 2ND R/O OR ON RTC
          .      *PITCH OFF-SUN                                *STOP READOUT
          .       *EX CANOPUS SENSOR ON RTC                       *EX COARSE S/S ON RTC Y+P
TIME    MIN.  0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .
MISSION   .R ACE-2
CONTROL   .                                                                        *PREDICTED DSS 62 SET
EVENTS    .                                                                                 *S/C STATUS MSG TO RISING D
          .
          .
          .
          .
TIME    MIN.  0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .
FPAC      .
EVENTS    .
TIME    MIN.  0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
.                                     ▷ GOLDSTONE READOUT
. NOTES     *INJECTION MANEUVER
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.  0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
S/C 9     .
EVENTS    .
----------.   ----------------------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.   ----------------------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL        -- ORBIT   1 --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                     W WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .-----------------------------------------------------------------------------------------------------
GMT     DAY. 217                              217                               217                          218
TIME    HRS.  21                               22                                23                            0
        MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .
            .*START CRBIT
SPACECRAFT.
EVENTS      .
            .
            .
            .
            .
TIME    MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .                                  *PREDICTED DSS 41 RISE
MISSICN     .
CCNTROL     .                                                                          *DSS HANDOVER PER A
EVENTS      .SS
            .                       *ACE-2 BRIEF RISING DSS
            .                            *PRELIM CCMC CCNF--MAP /0
            .                               --PHOTC--
            .
TIME    MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .
FPAC        .
EVENTS      .
TIME    MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
.
. NOTES
.          *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
S/C 9       .
EVENTS      .
-----------.-----------------------------------------------------------------------------------------------
S/C 8       .
EVENTS      .
-----------.-----------------------------------------------------------------------------------------------
S/C 5       .
EVENTS      .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.C.          DAY 233      TIME01434
```

```
MISSN PHASE            --ORBIT 1--PAGE 2
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEFOOOCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEF
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW    WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         126GGGGGGGGGGGGGGGGGGGGGGGGG               G
CAN OCC   .-------------------------------------------------------------OCCOCCOCCOCOOOCCCOCOOOCCOOC----
GMT     DAY.                          218                          218                          218
TIME    HRS.                            1                            2                            3
        MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .
            .
SPACECRAFT.
EVENTS      .
            .
            .
            .
            .
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .
MISSION     .CE-2
CONTROL     .                                        *PREDICTED DSS 12 SET
EVENTS      .                                                          *SEND SPC SEQ TO DSS
            .                                                            *FINAL CCMD CONF--MAP10
            .
            .
            .
            .
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
            .
FPAC        .
EVENTS      .
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
S/C 9       .
EVENTS      .
----------.------------------------------------------------------------------------------------------
S/C 8       .
EVENTS      .
----------.------------------------------------------------------------------------------------------
S/C 5       .
EVENTS      .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE    --ORBIT 1--PAGE 3
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12                                                                                                      M  MM
CAN CCC   .----------------------------------------------------------------------------------------------------------------
GMT    DAY.                         218                                218                                218
TIME   HRS.                          4                                  5                                  6
       MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
          .
SPACECRAFT.        *STORE COMMANDS
EVENTS    .
          .
          .
          .
          .
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                                                                             *ACE-2 BRIEF RISI
MISSION   .                                                                                         *PRED
CONTROL   .
EVENTS    .
          .
          .        *TX PHOTO SPC--MAP10
          .                       *S/C STATUS MSG TO RISING DSS
          .
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIMEC1434
```

299

```
MISSN PHASE ORBITAL        -- ORBIT   2  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW                       W
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC    .------------------------------------------------------------------------------------------
GMT    DAY.                          218                          218                          218
TIME   HRS.                           7                            8                            9
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
           .
           .
SPACECRAFT.
EVENTS     .*START ORBIT
           .                                                *EX FINE S/S ON RTC Y+P
           .                                                 *EX ACQUIRE SUN RTC
           .                                                                                    *U
           .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
           .NG DSS
MISSION    .ICTED DSS 62 RISE
CONTROL    .                 *DSS HANDOVER PER ACE-2
EVENTS     .                                                             *PREDICTED DSS 41 SET
           .                                                                         *START CAT
           .                                                                                    *U
           .
           .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
           .
FPAC       .
EVENTS     .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES
.
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9      .
EVENTS     .
----------.------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01434
```

300

```
MISSN PHASE          --ORBIT 2-- PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC   .---------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC------------------
GMT    DAY.                          218                          218                          218
TIME   HRS.                           10                           11                           12
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                                                         *TAKE  12
          .                                                              *ATT CHG
SPACECRAFT.                                                                    *TAKE   8
EVENTS    .                                                                      *REVERSE ATT
          .
          .                                                                            *PROC  12
          .PDATE ATT REF
          .                                               *EX TWTA OFF RTC
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
MISSION   .
CONTROL   .
EVENTS    .
          .1 COMPUTER SUPPORT
          .PDATE ATTITUDE REFERENCE
          .
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES                                                     *FRAME(LEADER)
.                                                                      *FRAMES 5-12
.                                                                        SITE A1
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C       .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE          -- ORBIT 2-- PAGE 2
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .--------------------------------------------------------------------------------
GMT    DAY.                          218                           218
TIME   HRS.                           13                            14
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .                       *EX CANOPUS SENSOR OFF RTC
          .                                *EX ROLL X DEG RTC
SPACECRAFT.                                     *ATT CHG
EVENTS    .                                           *TAKE   8
          .                                             *REVERSE ATT
          .                                                *PITCH OFF-SUN
          .                *STOP FILM PROCESSING              *PROC  15 147
          .                      *EX CANOPUS SENSOR ON RTC
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .
MISSION   .
CONTROL   .
EVENTS    .
          .
          .
          .                         *S/C STATUS MSG TO RISING DSS
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2---
.
. NOTES
.
.                                                     *FRAMES 13-20
.                                                      SITE A-2
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2---
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233      TIMEC1434
```

```
MISSN PHASE CRBITAL         -- CRBIT   3  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12  G              GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .----------------------------------------------------------------------------------------------
GMT    DAY.                  218                        218                          218
TIME   HRS.                   15                         16                           17
       MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .                  *STOP FILM PROCESSING
          .
SPACECRAFT.                                                       *UPDATE ATT REF
EVENTS    .                                                                           *ATT CHG
          .                                                                                 *TAKE
          .                                                                                   *REVER
          .                                                                                      *PI
          .*START CRBIT                                                                             *
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          . *ACE-2 BRIEF RISING DSS
MISSION   .  *PREDICTED DSS 12 RISE
CONTROL   .     *PRELIM CCMD CONF--MAP II
EVENTS    .      --TRANSFER & PHOTO--
          .                                                      *UPDATE ATTITUDE REFERENCE
          .                                                           *DSS HANDOVER PER ACE-2
          .
          .
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
FPAC      .
EVENTS    .
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NOTES    *APOLUNE
.
.                                                                                            *FRAME 21
.                                                                                             SITE A-3
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCC
RUN I.D.         DAY 233     TIMEC1434
```

```
MISSN PHASE          --ORBIT 3-- PAGE 2
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMM                                                     M
         126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT    DAY.            218                           218                           218
TIME   HRS.             18                            19                            20
       MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
          .
SPACECRAFT.
EVENTS    .1
          .SE ATT
          .TCH OFF-SUN
          .PROC   2
          .    *STOP FILM PROCESSING
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .                                                                    *PREDICTED DSS 62 S
MISSION   .                                                                       *TX TRANSFER SPC
CONTROL   .
EVENTS    .
          .
          .                                 *SEND SPC SEQ TO DSS
          .                                   *FINAL COMD CONF--MAP II
          .
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
FPAC      .
EVENTS    .
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01434
```

```
MISSN PHASE          -- ORBIT  3-- PAGE 3
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                                           W
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .-----------------------------------------------------------------------------
GMT     DAY.             218                            218
TIME    HRS.              21                             22
        MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .                                                                        *
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .
          .
TIME    MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .ET
MISSION   .--MAP II
CONTROL   .               *S/C STATUS MSG TO RISING DSS
EVENTS    .                                                                *ACE-2 BRIEF
          .                                                                        *PRE
          .                                                                        *END
          .                                                                           *
          .
TIME    MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .
FPAC      .
EVENTS    .
TIME    MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233       TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT   4  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41    WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------------------------------------------------
GMT    DAY. 218                           219                          219                            21
TIME   HRS.  23                            0                            1
       MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .UPDATE ATT REF
          .*START ORBIT
SPACECRAFT.                                        *ATT CHG
EVENTS    .                                              *TAKE   1
          .                                                *REVERSE ATT
          .                                                   *PITCH OFF-SUN
          .                                              (1) ACQUIRE *UPDATE ATT REF
          .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .                               *DSS HANDOVER PER ACE-2
MISSION   .                                                            *UPDATE ATTITUDE REFERENCE
CONTROL   .
EVENTS    . RISING DSS
          .DICTED DSS 41 RISE
          . CAT 1 COMPUTER SUPPORT
          .UPDATE ATTITUDE REFERENCE
          .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
FPAC      .
EVENTS    .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
.
. NOTES                                          *FRAME 22
.
.           *APOLUNE                             SITE AH
.
.                                                 (1) NOTE: S/C OPERATING ON-SUN
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE          -- ORBIT 4-- PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12                        G
CAN CCC  .---------------------------------------------OCOCCCOCCCOCCCOCOCOOOOCOCO-------------------
GMT    DAY.9                           219                          219                          21
TIME   HRS.2                            3                            4
       MIN.0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5----
         .
         .
SPACECRAFT.
EVENTS   .
         .
         .
         .
         .
TIME   MIN.0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5----
         .
MISSION  .
CONTROL  .                *PREDICTED DSS 12 SET
EVENTS   .
         .
         .
         .
         .
TIME   MIN.0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5----
         .
FPAC     .
EVENTS   .
TIME   MIN.0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5----
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.0----1----2----3----4----5---- ----1----2----3----4----5----0----1----2----3----4----5----
S/C 9    .
EVENTS   .
---------.------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233     TIMEC1434
```

```
MISSN PHASE        -- ORBIT 4-- PAGE 3
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62                                                           M    MMMM
          12
CAN CCC   .----------------------------------------------------------------------
GMT    DAY.9                         219                          219
TIME   HRS.5                          6                            7
       MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .                            *PROC   2
          .                                 *STOP FILM PROCESSING
SPACECRAFT.                                                *EX SOLAR ECLIPSE O
EVENTS    .                                                 *EX ROLL UPDATE RT
          .
          .
          .
          .                           *TAKE   1
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
MISSION   .
CONTROL   .
EVENTS    .    *S/C STATUS MSG TO RISING DSS
          .                                                *ACE-2 BRIEF RISING
          .                                                          *PREDICTE
          .
          .
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
FPAC      .
EVENTS    .
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1---
.
. NOTES
.                                     *FRAME 23 (R.S.)
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1---
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.       DAY 233     TIMEC1434
```

```
MISSN PHASE ORBITAL        -- ORBIT   5  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .------------------------------------------------------------------------------------------------------
GMT    DAY.                    219                           219                           219
TIME   HRS.                      8                             9                            10
       MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .                                          *START THRUST
          .                                          *END THRUST-REV ATT
SPACECRAFT.N                                          *EX JUMP TO LOC 137
EVENTS    .C                                              *ACQ SUN
          .*START ORBIT                                    *PITCH OFF-SUN
          .     *EX CANOPUS SENSOR ON RTC                                          *EX SOLAR ECLIPSE OFF
          .       *EX CANOPUS SENSOR OFF RTC                                                             *UP
          .                                *START ATT CHANGE
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
MISSION   .                       *DSS HANDOVER PER ACE-2
CONTROL   .                         *TX JUMP RTC
EVENTS    .                                                                      *PREDICTED DSS 41 SET
          . DSS                                                                                          *UP
          .D DSS 62 RISE
          .                     *PRELIM COMD CONF--MAP/2
          .                         --PHOTO--
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
FPAC      .
EVENTS    .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES                                              *TRANSFER MANEUVER
.
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN T.C.          DAY 233     TIME 1434
```

```
MISSN PHASE        --ORBIT 5-- PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN CCC   .-------------------------------------OOOCCCOCCOCCOCCCCOCCCCCCCOCO---------------------------
GMT    DAY.              219                          219                          219
TIME   HRS.               11                           12                           13
       MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .DATE ATT REF
          .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
                                                                                        *S/C STA
          .
MISSION   .
CONTROL   .
EVENTS    .
          .DATE ATTITUDE REFERENCE
                                                                      *SEND SPC SEQ TO DSS
          .                                                             *FINAL COMD CONF--MAP/2
          .
          .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
FPAC      .
EVENTS    .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME01434
```

```
MISSN PHASE         -- ORBIT 5-- PAGE 3
EARTH CCC .EEEEBEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                                GGGGGGG
CAN CCC   .-----------------------------------------------------------------------
GMT   DAY.               219                           219
TIME  HRS.                14                            15
      MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3---
          .            *TAKE   1
          .              *REVERSE ATT
SPACECRAFT.                 *PITCH OFF-SUN
EVENTS    .                   *STORE COMMANDS
          .                                      *EX ROT ANT 1 DEG L RTC 13 TIMES
          .
          .
          .      *ATT CHG
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3---
          .TUS MSG TO RISING DSS
MISSION   .                   *TX PHOTO SPC--MAP 12
CONTROL   .                                     *ACE-2 BRIEF RISING DSS
EVENTS    .                                                           *PREDIC
          .
          .
          .
          .
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3---
          .
FPAC      .
EVENTS    .
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3---
.
. NOTES
.                      *FRAME 24
.                       SITE A6
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3---
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL        -- CRBIT   6  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .------------------------------------------------------------------------------------------------
GMT    DAY.        219                          219                          219
TIME   HRS.         16                           17                           18
       MIN.-4----5----0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4--
          .           *EX 2ND R/O CR ON RTC
          .                                          *STOP READOUT
          .                                                                                *EX ROT
SPACECRAFT.                                                                                     *U
EVENTS    .
          .
          .*START ORBIT
          .    *EX TWTA ON RTC
          .         *EX READOUT PREP RTCS
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
          .
MISSION   .
CONTROL   .
EVENTS    .TED DSS 12 RISE
          .                                                        *DSS HANDOVER PER ACE-2
          .                                                                                     *U
          .
          .
          .
TIME   MIN.-4----5----0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4--
          .
FPAC      .
EVENTS    .
TIME   MIN.-4----5----0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4--
.
. NOTES
.
.          *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
S/C 9     .
EVENTS    .------------------------------------------------------------------------------------------------
----------.------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .------------------------------------------------------------------------------------------------
----------.------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE          --ORBIT 6--PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM           M
         126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC    .---------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCC-----------------------------
GMT     DAY.      219                           219                           219
TIME    HRS.       19                            20                            21
        MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
           .                                                                 *PROC   2
           .                                                                      *STOP FILM PROCE
SPACECRAFT. ANT 1 DEG RT RTC 3 TIMES                                                    *EX READOU
EVENTS     .PDATE ATT REF                                                                  *EX 2ND
           .                                                     *ATT CHG
           .                                                           *TAKE   1
           .                                                             *REVERSE ATT
           .                                                               *PITCH OFF-SUN
TIME    MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
           .
MISSION    .
CONTROL    .
EVENTS     .
           .
           .PDATE ATTITUDE REFERENCE
           .                                              *PREDICTED DSS 62 SET
           .
TIME    MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
           .
FPAC       .
EVENTS     .
TIME    MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
.
. NOTES                                                                *FRAME 25
.                                                                       SITE A-7
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
S/C 9      .
EVENTS     .
----------.-------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.-------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE        --ORBIT 6 -- PAGE 3
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                    W
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .--------------------------------------------------------------------
GMT    DAY.     219                          219                               2
TIME   HRS.       22                          23
       MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
          .SSING
SPACECRAFT.T PREP RTCS
EVENTS    . R/C DR ON RTC
          .                                  *STOP READOUT
          .                                          *EX TWTA OFF RTC
          .
          .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5---
          .       *S/C STATUS MSG TC RISING DSS
MISSION   .                                                 *PREDICTED DSS 41 R
CONTROL   .                                                      *ACE-2 BRIEF R
EVENTS    .
          .
          .
          .
          .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
FPAC      .
EVENTS    .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5---
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5---
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIMEC1434
```

```
MISSN PHASE ORBITAL       -- ORBIT   7  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41 WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------------------------------------------------
GMT     DAY.220                        220                          220                           220
TIME    HRS. 0                          1                            2                             3
        MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                                         *ATT CHG
          .                                               *TAKE   1
SPACECRAFT.                                                 *REVERSE ATT
EVENTS    .                                                   *PITCH OFF-SUN
          .                                                                       *EX COARSE S/S ON
          .                                                                        *EX PITCH PLUS X
          .*START ORBIT
          .    *UPDATE ATT REF
TIME    MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
MISSION   .ISE
CONTROL   .ISING DSS
EVENTS    .    *UPDATE ATTITUDE REFERENCE
          .                                                     *DSS HANDOVER PER ACE-2
          .
          .
          .
          .
TIME    MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME    MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES
.          *APOLUNE
.                                                      *FRAME 26
.                                                       SITE A-8
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 3     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE        -- ORBIT 7-- PAGE 2
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEF
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .---------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOOO-------------------------
GMT    DAY.                            220                           220                           220
TIME   HRS.                              4                             5                             6
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
          .
SPACECRAFT.
EVENTS    .
          . RTC Y+P
          . DEG RTC
          .
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
MISSION   .
CONTROL   .
EVENTS    .
          .
          .              *PREDICTED DSS 12 SET
          .                                                              *START CAT 1 COMPUTER SUPPOR
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIMEC1434
```

```
MISSN PHASE        -- ORBIT 7 -- PAGE 3
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12
CAN OCC   .--------------------------------------------------------------------------
GMT    DAY.                             220                             220
TIME   HRS.                              7                               8
       MIN.---1----2----3----4----5----C----1----2----3----4----5----0----1---
          .
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .EX CHANGE SHUTTER SPEED
          .*EX CHANGE SHUTTER SPEED
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1---
          .              *S/C STATUS MSG TO RISING DSS
MISSION   .                                                          *ACE-2 BR
CONTROL   .
EVENTS    .
          .
          .
          .T
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1---
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----C----1----2----3----4----5----C----1---
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL       -- ORBIT   8  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW                  W
         62  M    MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC   .-----------------------------------------------------------------------------------------------------
GMT    DAY.                  220                           220                           220
TIME   HRS.                   9                             10                            11
       MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .*START ORBIT
          .                 *ATT CHG
SPACECRAFT.                       *TAKE   1
EVENTS    .                         *REVERSE ATT
          .                            *PITCH OFF-SUN
          .                                    *EX CHANGE SHUTTER SPEED
          .                                    *EX CHANGE SHUTTER SPEED
          .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .                                                                     *PREDICTED DSS 41 SET
MISSION   .IEF RISING DSS
CONTROL   .  *PREDICTED DSS 62 RISE
EVENTS    .            *END CAT 1 COMPUTER SUPPORT
          .                            *DSS HANDOVER PER ACE-2
          .                                             *PRELIM CCMD CONF--MAP/3
          .                                                --ORBIT ADJUST--
          .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .
FPAC      .
EVENTS    .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
.
. NOTES     *APOLUNE
.                         *FRAME 27
.                          SITE A-9 EARTH PHOTO
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE          --ORBIT 8--PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC   .---------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------------
GMT     DAY.              220                          220                          220
TIME    HRS.               12                           13                           14
        MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .            *PROC   2
          .                 *STOP FILM PROCESSING
SPACECRAFT.
EVENTS    .
          .
          .
          .
          .     *UPDATE ATT REF
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .
MISSION   .     *UPDATE ATTITUDE REFERENCE
CONTROL   .                                                                            *SEND SPC SEC T
EVENTS    .                                                                              *FINAL COMD C
          .                                                                                 --ORBIT AD
          .
          .
          .
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .
FPAC      .
EVENTS    .
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE          -- ORBIT 8 -- PAGE 3
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                                  G
CAN OCC   .-----------------------------------------------------------------------
GMT     DAY.                 220                           220
TIME    HRS.                  15                            16
        MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3---
           .
           .
SPACECRAFT.         *ATT CHG
EVENTS     .                *TAKE   1
           .                  *REVERSE ATT
           .                    *PITCH OFF-SUN
           .                          *STORE COMMANDS
           .
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3---
           .                                                          *PREDICTED
MISSION    .
CONTROL    .0 DSS
EVENTS     .ONF--MAP13
           .JUST--
           .                          *TX ORBIT ADJUST SPC-MAP13
           .                            *S/C STATUS MSG TO RISING DSS
           .
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3---
           .
FPAC       .
EVENTS     .
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3---
.
. NOTES
.
.                        *FRAME 28
.                         SITE A-10
.
.
.
.
.
.
.
.
.
TIME    MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3---
S/C 9      .
EVENTS     .
-----------.-----------------------------------------------------------------------
S/C 8      .
EVENTS     .
-----------.-----------------------------------------------------------------------
S/C 5      .
EVENTS     .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.            DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL      -- ORBIT   9  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                  GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .--------------------------------------------------------------------------------------------
GMT   DAY.         220                           220                            220
TIME  HRS.          17                            18                             19
       MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .
          .*START ORBIT
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .DSS 12 RISE
MISSION   .   *ACE-2 BRIEF RISING DSS
CONTROL   .                                                   *DSS HANDOVER PER ACE-2
EVENTS    .
          .
          .
          .
          .
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES    *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME01434
```

```
MISSN PHASE         --ORBIT 9-- PAGE 2
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62                     M
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .----------------------------------------OOCOOOOOOCOCOCCCCCCCCCCCCC--------------------------
GMT    DAY.          220                          220                          220
TIME   HRS.           20                           21                           22
       MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .       *UPDATE ATT REF
          .                                                             *ATT CHG
SPACECRAFT.                                                                   *TAKE   I
EVENTS    .                                                                     *REVERSE ATT
          .                                                                        *PITCH OFF-SUN
          .
          .
          .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
MISSION   .
CONTROL   .
EVENTS    .       *UPDATE ATTITUDE REFERENCE
          .                   *PREDICTED DSS 62 SET
          .
          .
          .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES
.                                                                      *FRAME 29
.                                                                       SITE A-11
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

322

```
MISSN PHASE       --ORBIT 9-- PAGE 3
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                   W
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .---------------------------------------------------------------------------
GMT   DAY.       220                          221                          22
TIME  HRS.        23                            0
      MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .
TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
MISSION   .
CONTROL   .
EVENTS    .
          .
          .                         *S/C STATUS MSG TO RISING DSS
          .                               *PREDICTED DSS 41 RISE
          .
TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
FPAC      .
EVENTS    .
TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----
.
. NOTES
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  10  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                      WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------------------------------------------------
GMT    DAY.1                          221                           221                           221
TIME   HRS.1                            2                             3                             4
       MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
                                                               *TAKE   1
           .                                                     *REVERSE ATT
           .                                                       *PITCH OFF-SUN
SPACECRAFT.                                                            *PROC   2
EVENTS     .                                                              *EX ROLL UPDATE RTC
           .                                                                *STOP FILM PROCESSING
           .*START ORBIT                                                        *   *EX SOLAR ECLIPSE 0
           .                                                  *ATT CHG
           .                                                       *UPDATE ATT REF       *EX ROT ANT 1 DEG
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
           .*ACE-2 BRIEF RISING DSS
MISSION    .                                                       *UPDATE ATTITUDE REFERENCE
CONTROL    .                                                            *DSS HANDOVER PER ACE-2
EVENTS     .
           .
           .
           .
           .
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
           .
FPAC       .
EVENTS     .
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
.
. NOTES                                                         *FRAME 30
.                                                                 SITE A-12
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
S/C 9      .
EVENTS     .
----------.-----------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.-----------------------------------------------------------------------------------------------
S/C 9      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE        --ORBIT 10--PAGE 2
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12GGGGGG
CAN OCC   .-------------------------------------OOOCOCOOCCCOCCCCCOCOCCCCC---------------
GMT    DAY.                          221                           221
TIME   HRS.                           5                             6
       MIN.----1----2----3----4----5----0----1----2----3----4----5----C----1----2----3----4-
          .    *EX CANOPUS SENSOR ON RTC                   *EX SOLAR ECLIPSE OFF
          .     *EX CANOPUS SENSOR OFF RTC                   *EX PITCH PLUS X DEG RTC X=.011
SPACECRAFT.                  *START ATT CHANGE
EVENTS    .                            *START THRUST
          .                            *END THRUST-REV ATT
          .                             *EX JUMP TO LCC 137
          .N                                  *ACQ SUN
          . RT RTC 51 TIMES                    *PITCH OFF-SUN
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
MISSION   .
CONTROL   .
EVENTS    .     *PREDICTED DSS 12 SET
          .                *TX JUMP RTC
          .
          .
          .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
FPAQ      .
EVENTS    .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
.
. NOTES
.                               *2ND TRANSFER MANEUVER
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL        -- ORBIT  11  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                                                                         .MMMMMMMMM
         12
CAN OCC   .-----------------------------------------------------CCCCCCCOOOOCCCCOCOOOCOOO-----------------
GMT   DAY.        221                            221                            221
TIME  HRS.          7                              8                              9
      MIN.---5----0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5-
          .                                                                                   *REVERSE
          .                                                                                     *PITCH
SPACECRAFT.*START ORBIT                                                                           *EX T
EVENTS    .                                *UPDATE ATT REF                                          *EX
          .                                                  *EX ROT ANT 1 DEG RT RTC 8 TIMES
          .                                                                  *EX ACQUIRE SUN RTC
          .                                                                            *ATT CHG
          .                                                                                  *TAKE   1
TIME  MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .                         *S/C STATUS MSG TO RISING DSS
MISSION   .                                *UPDATE ATTITUDE REFERENCE
CONTROL   .                                                                *ACE-2 BRIEF RISING DSS
EVENTS    .                                                                                   *PREDICTE
          .
          .  *PRELIM CCMD CONF--MAP 14
          .     --PHCTO--
          .
TIME  MIN.---5----C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
          .
FPAC      .
EVENTS    .
TIME  MIN.---5----0----1----2----3----4----5----C----1----2----3----4----5----0----1----2----3----4----5-
.
. NOTES                                                                                   *FRAME 31
.                                                                                          SITE A-13
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  12  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC-------------------
GMT    DAY. 221                          221                          221                          221
TIME   HRS.  10                           11                           12                           13
       MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .ATT                                                       *STORE COMMANDS
          .OFF-SUN
SPACECRAFT.WTA ON RTC
EVENTS    . PITCH PLUS X DEG RTC X=38.
          .*START ORBIT
          .          *EX READOUT PREP RTCS
          .             *EX 2ND R/O OR ON RTC
          .                                  *STOP READOUT
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                                  *PREDICTED DSS 41 SET
MISSION   .                                                        *TX PHOTO SPC--MAP/4
CONTROL   .
EVENTS    .D DSS 62 RISE
          .                *DSS HANDOVER PER ACE-2
          .                                       *SEND SPC SEQ TO DSS
          .                                         *FINAL COMD CONF--MAP/4
          .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  13 --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN CCC   .---------------------------------------------------OOCCCCOCOCCCCCCCCCCCCOO---------------------
GMT   DAY.                                 221                            221                            221
TIME  HRS.                                  14                             15                             16
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .                                                                                       *REVERSE AT
          .*START ORBIT                                                                              *PITCH O
SPACECRAFT.                                 *EX PITCH PLUS X DEG RTC X=38.
EVENTS    .                                 *UPDATE ATT REF
          .                                                   *PRCC   2
          .                                                        *STOP FILM PROCESSING
          .                                                                          *ATT CHG
          .                                                                                *TAKE    1
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
MISSION   .
CONTROL   .                                 *UPDATE ATTITUDE REFERENCE
EVENTS    .                                                                      *S/C STATUS MSG TO RISIN
          .
          .
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
.
. NOTES                                                                                   *FRAME 32
.                                                                                          SITE A-14
.          *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIMEC1434
```

```
MISSN PHASE CRBITAL       -- CRBIT  14  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                       G             GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .-----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC------------------
GMT    DAY.                     221                          221                         221
TIME   HRS.                      17                           18                          19
       MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .T
          .FF-SUN
SPACECRAFT.*START CRBIT
EVENTS    . *EX CHANGE SHUTTER SPEED
          .                                             *EX ROT ANT 1 DEG RT RTC 5 TIMES
          .
          .
          .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .                     *PREDICTED DSS 12 RISE
MISSICN   .                                                                                      *DSS HA
CCNTRCL   .
EVENTS    .G DSS
          .   *PRELIM CCMD CONF--MAP/S
          .      --PHOTC--
          .                    *ACE-2 BRIEF RISING DSS
          .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
          .
FPAC      .
EVENTS    .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
.
. NOTES
.          *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  15  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM        M
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT     DAY.                   221                          221                          221
TIME    HRS.                   20                           21                           22
        MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
            .                                               *TAKE   4
            .                                                 *REVERSE ATT
SPACECRAFT.                                                     *PITCH OFF-SUN
EVENTS      .                                                          *EX READOUT PREP RTCS
            .                                                             *EX 2ND R/O OR ON RTC
            .*START ORBIT                                                                     *STORE COMMANDS
            .                               *UPDATE ATT REF                                             *STOP
            .                                          *ATT CHG
TIME    MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
            .                                                                                              .
MISSION     .NOOVER PER ACE-2
CONTROL     .                               *UPDATE ATTITUDE REFERENCE
EVENTS      .                                           *SEND SPC SEQ TO DSS
            .                                             *FINAL COMD CONF--MAP /5
            .                                                      *PREDICTED DSS 62 SET
            .                                                                                 *TX PHOTO SPC--
            .
TIME    MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
            .
FPAC        .
EVENTS      .
TIME    MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
.
. NOTES                                            *FRAMES 33-36
.                                                    SITE II-1
.            *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
S/C 9       .
EVENTS      .
----------.--------------------------------------------------------------------------------------------------
S/C 8       .
EVENTS      .
----------.--------------------------------------------------------------------------------------------------
S/C 5       .
EVENTS      .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.            DAY 233      TIME01434
```

```
MISSN PHASE CRBITAL         -- CRBIT  16  --
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                                W
           62
           126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC    .-----------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-------------------
GMT     DAY.         221                            222                            222
TIME    HRS.          23                              0                              1
        MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
           .    *EX READCUT PREP RTCS
           .       *EX 2ND R/C DR ON RTC
SPACECRAFT.                                             *STOP READCUT
EVENTS     .                                                 *PROC   2
           .                                                      *STOP FILM PROCESSING
           .
           . READOUT
           .*START ORBIT
TIME    MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
           .PRELIM CCMD CONF--MAP/6
MISSION    .  --PHOTC--
CONTROL    .                                               *PREDICTED DSS 41 RISE
EVENTS     .                                                 *S/C STATUS MSG TO RISING DSS
           .
           .
           .MAP/5
           .
TIME    MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
           .
FPAC       .
EVENTS     .
TIME    MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
.
. NOTES
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
S/C 9      .
EVENTS     .
----------.----------------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.----------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233       TIMEC1434
```

```
MISSN PHASE ORBITAL        -- ORBIT  17  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41               WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG         G
CAN OCC  .----------------------------------------------------OCCCCCCOCCCCCCCCCOCCOOOCCO---------------------
GMT    DAY.   222                            222                          222                          222
TIME   HRS.    2                              3                            4                            5
       MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
         .                                                *TAKE   1
         .                                                  *REVERSE ATT
SPACECRAFT.                                                   *PITCH OFF-SUN
EVENTS   .                                                       *EX READOUT PREP RTCS
         .                                                          *EX 2ND R/O DR ON RTC
         .                                                                            *STORE COMMANDS
         .*START ORBIT
         .                           *UPDATE ATT REF
         .                                     *ATT CHG
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
         .                                    *FINAL COMD CONF--MAP 16
MISSION  .                                                *DSS HANDOVER PER ACE-2
CONTROL  .                                                                        *TX PHOTO SPC--MAP 16
EVENTS   .
         .*ACE-2 BRIEF RISING DSS
         .                           *UPDATE ATTITUDE REFERENCE
         .                                    *SEND SPC SEQ TO DSS
         .
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0

FPAO     .
EVENTS   .
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
.
. NOTES                                           *FRAME 37
.
.                                                 SITE V-2
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
S/C 9    .
EVENTS   .
---------.------------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.------------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL        -- CRBIT  19  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN CCC   .----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-------------------
GMT    DAY.                        222                         222                          222
TIME   HRS.                         6                           7                            8
       MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .           *EX CHANGE SHUTTER SPEED
          .
SPACECRAFT.
EVENTS    .
          .
          .
          .*START CRBIT
          .    *STOP READCUT
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
MISSION   .
CONTROL   .
EVENTS    .PREDICTED DSS 12 SET
          .   *END CAT 1 COMPUTER SUPPORT
          .    *PRELIM COMC CCNF--MAP/7
          .       --PHOTO--
          .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
FPAC      .
EVENTS    .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
.
. NOTES
.           *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
S/C 9     .
EVENTS    .
---+------.------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
---+------.------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
---+------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  19  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62                                                                       M                     MM
          12
CAN OCC   .-------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT     DAY.                    222                            222                           222
TIME    HRS.                     9                             10                            11
        MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .                                                             *STOP FILM PROCESSING        *STORE
          .*START ORBIT                                                   *EX CHANGE SHUTTER SPEED
SPACECRAFT.                     *UPDATE ATT REF                             *EX CHANGE SHUTTER SPEED
EVENTS    .                                     *ATT CHG                             *ATT CHG
          .                                           *TAKE   1                            *TAKE   1
          .                                             *REVERSE ATT                         *REVERSE ATT
          .                                                *PITCH OFF-SUN                       *PITCH OFF-
          .                                                   *PROC   2                           *EX CHANG
TIME    MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .                     *UPDATE ATTITUDE REFERENCE
MISSION   .                              *S/C STATUS MSG TO RISING DSS
CONTROL   .                                     *SEND SPC SEQ TO DSS
EVENTS    .                                       *FINAL COMD CONF--MAP 17
          .                                                                   *PREDICTED DSS 62 RISE
          .                                                                          *ACE-2 BRIEF RISI
          .                                                                                    *TX PHO
          .
TIME    MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
          .
FPAC      .
EVENTS    .
TIME    MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
.
. NOTES                                               *FRAME 38
.                                                      SITE V-3                        *FRAME 39
.          *APOLUNE                                                                      SITE A-15
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2-
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  20  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWW             W
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .----------------------------------------------------OCCCCCCOCCCCCCCCOOOOOOCCO--------------------
GMT    DAY.                 222                          222                          222
TIME   HRS.                  12                           13                           14
       MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .COMMANDS                                                                   *EX ROT ANT 1 DEG RT RTC
          .*START ORBIT                                                                             13 TIMES
SPACECRAFT.               *UPDATE ATT REF
EVENTS    .                                  *ATT CHG
          .                                        *TAKE   1
          .                                          *REVERSE ATT
          .SUN                                         *PITCH OFF-SUN
          .E SHUTTER SPEEC                                        *EX CHANGE SHUTTER SPEED
TIME   MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          . *PRELIM CCMD CONF--MAP 18
MISSION   .    --PHOTO--
CONTROL   .            *DSS HANDOVER PER ACE-2
EVENTS    .                   *UPDATE ATTITUDE REFERENCE
          .                                 *PREDICTED DSS 41 SET
          .NG DSS
          .TC SPC--MAP 17
          .
TIME   MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
FPAC      .
EVENTS    .
TIME   MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
.
. NOTES                                    *FRAME 40
.                                          SITE V-4
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

335

```
MISSN PHASE CRBITAL        -- CRBIT  21  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN OCC   .---------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-------------------
GMT    DAY.          222                         222                          222
TIME   HRS.           15                          16                           17
       MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
          .                                                          *STOP FILM PROCESSING
          .                                                                                *STORE COMMA
          .*START ORBIT
SPACECRAFT.                        *UPDATE ATT REF
EVENTS    .                                        *ATT CHG
          .                                              *TAKE   1
          .                                                *REVERSE ATT
          .                                                   *PITCH CFF-SUN
          .                                                     *PRCC   2
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
          .                                       *FINAL COMD CONF--MAP/8
MISSION   .                                                                      *S/C STATUS MSG TO RISI
CONTROL   .                                                                                *TX PHOTO SP
EVENTS    .
          .
          .
          .                        *UPDATE ATTITUDE REFERENCE
          .                                     *SEND SPC SEQ TO DSS
          .
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
          .
FPAC      .
EVENTS    .
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
.
. NOTES
.          *APOLUNE
.                                                       *FRAME 41
.                                                        SITE V-51
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4--
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.C.           CAY 233      TIMEC1434
```

336

```
MISSN PHASE CRBITAL        -- ORBIT  22  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12              C                        GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC   .---------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT    DAY.     222                           222                           222                           2
TIME   HRS.     18                            19                            20
       MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
          .NCS
SPACECRAFT.*START ORBIT
EVENTS    .      *EX TELEMETER MEMORY 102
          .                                               *EX READOUT PREP RTCS
          .                                                  *EX 2ND R/C DR CN RTC
          .                                                                                          *S
          .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
MISSION   .NO DSS
CCNTROL   .C--MAP 18
EVENTS    .              *PREDICTED DSS 12 RISE
          .                      *ACE-2 BRIEF RISING DSS
          .                                                                       *DSS HANDOVER PER ACE-2
          .
          .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
FPAC      .
EVENTS    .
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
.
. NOTES    *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE CRBITAL        -- ORBIT  23  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMM          M
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO--------------------
GMT    DAY.22                        222                          222                          223
TIME   HRS.21                         22                           23                           C
       MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .                        *UPDATE ATT REF                                  *EX CHANGE SHUTTER SPEED
          .                                         *ATT CHG
SPACECRAFT.                                               *TAKE   1
EVENTS    .                                                 *REVERSE ATT
          .                                                   *PITCH OFF-SUN
          .                                                       *PROC   2
          .TOP READOUT                                                 *STOP FILM PROCESSING
          .*START ORBIT                                                     *EX CHANGE SHUTTER SPEED
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .
MISSION   .                   *PREDICTED DSS 62 SET
CONTROL   .                        *UPDATE ATTITUDE REFERENCE
EVENTS    .
          .
          .
          .*PRELIM CCMD CONF--MAP 19
          .    --PHOTO--
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .
FPAC      .
EVENTS    .
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
.
. NOTES
.          *APOLUNE
.                                                         *FRAME 42
.                                                          SITE V-6
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.------1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  24  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                  W                                                   WWWWWWWWWW
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT    DAY.                      223                            223                            223
TIME   HRS.                       1                              2                              3
       MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
          .*START ORBIT
SPACECRAFT.                              *UPDATE ATT REF
EVENTS    .                               *EX ROT ANT 1 DEG RT RTC 3 TIMES
          .
          .
          .
          .
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .                                         *FINAL COMD CONF--MAP/9
MISSION   .                                                                       *ACE-2 BRIEF RISING DSS
CONTROL   .
EVENTS    .                        *S/C STATUS MSG TO RISING DSS
          .                            *PREDICTED DSS 41 RISE
          .                             *UPDATE ATTITUDE REFERENCE
          .                                    *SEND SPC SEQ TO DSS
          .
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
FPAC      .
EVENTS    .
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
.
. NOTES    *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01434
```

340

```
MISSN PHASE ORBITAL       -- ORBIT  25  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         126GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG             G
CAN OCC   .---------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT    DAY.                     223                            223                           223
TIME   HRS.                      4                              5                             6
       MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .                          *PITCH OFF-SUN
          .                                 *EX READOUT PREP RTCS
SPACECRAFT.                                    *EX 2ND R/O OR ON RTC
EVENTS    .                                      *STORE COMMANDS
          .*START ORBIT                                                                   *STOP READOUT
          .           *ATT CHG                                                               *EX CHANGE SHU
          .                 *TAKE   1                                                                *PROC
          .                   *REVERSE ATT                                                                 *
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
MISSION   .
CONTROL   .*PRELIM COMD CONF--MAP 20
EVENTS    .   --PHOTO--
          .                    *DSS HANDOVER PER ACE-2
          .                                      *TX PHOTO SPC--MAP 19
          .                                                               *PREDICTED DSS 12 SET
          .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
FPAC      .
EVENTS    .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NOTES
.          *APOLUNE
.                             *FRAME 43
.                              SITE A-16.1
.
.
.
.
.
.
.
.
.
.
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE CRBITAL        -- CRBIT  26  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12
CAN CCC   .-----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT   DAY.            223                         223                          223
TIME  HRS.              7                           8                            9
      MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .*START CRBIT                                           *EX 2ND R/C OK ON RTC
          .     *EX RCT ANT 1 DEG RT RTC 2 TIMES                                                  *STORE COMMAND
SPACECRAFT.                   *UPDATE ATT REF
EVENTS    .                                  *ATT CHG
          .                                        *TAKE   4
          .TTER SPEED                                *REVERSE ATT
          . 2                                            *PITCH OFF-SUN
          .STCP FILM PROCESSING                           *EX READOUT PREP RTCS
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .                   *UPDATE ATTITUDE REFERENCE
MISSION   .                               *SEND SPC SEQ TO DSS
CONTROL   .                                 *FINAL CCMD CONF--MAP 20
EVENTS    .                                                                             *TX PHOTO SPC-
          .
          .
          .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES    *APCLUNE
.                                                   *FRAMES 44-47
.                                                    SITE V - 8a
.
.
.
.
.
.
.
.
.
.
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233     TIME01434
```

```
MISSN PHASE CRBITAL        -- CRBIT  27 --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                                                  M              MMMMMMMMMMMMMMMM
         12
CAN CCC  .---------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT    DAY.        223                         223                         223
TIME   HRS.        10                          11                          12
       MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
         .                *EX CHANGE SHUTTER SPEED                *EX 2ND R/C OR ON RTC
         .S                       *UPDATE ATT REF
SPACECRAFT.*START ORBIT                  *EX ROT ANT 1 DEG RT RTC 6Times
EVENTS   .        *STOP READOUT                      *ATT CHG
         .            *PROC   2                            *TAKE   4
         .                 *STOP FILM PROCESSING             *REVERSE ATT
         .                  *EX CHANGE SHUTTER SPEEC            *PITCH OFF-SUN
         .                  *EX CHANGE SHUTTER SPEED               *EX READOUT PREP RTCS
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
         .                        *UPDATE ATTITUDE REFERENCE
MISSION  .                                                                      *ACE-2 BRIEF RISING DSS
CONTROL  .                                                                      *PREDICTED DSS 62 RISE
EVENTS   .-MAP 20
         .*PRELIM COMD CONF--MAP21
         .   --PHOTO--
         .                    *S/C STATUS MSG TO RISING DSS
         .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
         .
FPAC     .
EVENTS   .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
.
. NOTES                                                    *FRAMES 48-51
.
.          *APOLUNE                                         SITE V-86
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 3    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  28  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWW
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC   .----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT    DAY. 223                          223                          223                          223
TIME   HRS.  13                           14                           15                           16
       MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                             *ATT CHG
          .*START ORBIT                                        *TAKE   1
SPACECRAFT.      *STOP READOUT                                   *REVERSE ATT
EV--TS    .       *PROC   2                                        *EX READOUT PREP RTCS
          .            *STOP FILM PROCESSING                        *PITCH OFF-SUN
          .                  *EX CHANGE SHUTTER SPEED                 *EX 2ND R/C OR ON RTC
          .                  *EX CHANGE SHUTTER SPEED                         *STORE COMMANDS
          .                       *UPDATE ATT REF
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .                                          *FINAL COMD CONF--MAP 21
MISSION   .                                                                   *TX PHOTO SPC--MAP 21
CONTROL   .
EVENTS    .*DSS HANDOVER PER ACE-2
          .                 *PREDICTED DSS 41 SET
          .                       *UPDATE ATTITUDE REFERENCE
          .                                     *SEND SPC SEQ TO DSS
          .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
          .
FPAC      .
EVENTS    .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
.
. NOTES
.         *APOLUNE
.                                                      *FRAME 52
.
.                                                       SITE V-9.1
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0--
S/C 9     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233 .    TIME01434
```

```
MISSN PHASE CRBITAL        -- CRBIT  29  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN CCC   .-----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT   DAY.                        223                          223                          223
TIME  HRS.                         17                           18                           19
      MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .   *STOP READOUT                    *EX 2ND R/O OR ON RTC                                   *EX REA
          .    *PROC   2                         *EX COARSE S/S ON RTC Y+P                                *EX
SPACECRAFT.         *STOP FILM PROCESSING         *EX FINE S/S OFF RTC Y+P
EVENTS    .           *EX CHANGE SHUTTER SPEED                                  *STOP READOUT
          .           *EX CHANGE SHUTTER SPEED                                      *ATT CHG
          .                           *UPDATE ATT REF                                     *TAKE    1
          .                               *EX PITCH PLUS X DEG RTC X=38.                    *REVERSE ATT
          .*START ORBIT                  *EX READOUT PREP RTCS                                *PITCH OFF-SUN
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .
MISSION   .
CONTROL   .*PRELIM CCMD CONF--MAP 22
EVENTS    .   --PHOTO--
          .                           *UPDATE ATTITUDE REFERENCE
          .                                    *S/C STATUS MSG TO RISING DSS
          .                                                                                   *ACE-2 BRIEF R
          .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .
FPAC      .
EVENTS    .
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
.
. NOTES     *APOLUNE
.                                                                                      *FRAME 53
.                                                                                       SITE A-17.1
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01434
```

344

```
MISSN PHASE CRBITAL        -- CRBIT  30  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCO
DSS VIEW 41                                                                                                          ▷
           62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM          M
           12 GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN CCC    .----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCC000-------------------
GMT     DAY.                   223                          223                          223
TIME    HRS.                    20                           21                           22
        MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
           .DCUT PREP RTCS        *UPDATE ATT REF                                *STORE COMMANDS
           .2ND R/O DR ON RTC                   *EX ROT ANT 1 DEG RT RTC 3 TIMES                           *STOP
SPACECRAFT.*START ORBIT                           *ATT CHG
EVENTS     .          *STOP READOUT                     *TAKE   1
           .            *PROC   2                         *REVERSE ATT
           .                 *STOP FILM PROCESSING          *EX READOUT PREP RTCS
           .                  *EX CHANGE SHUTTER SPEED       *PITCH OFF-SUN
           .                    *EX CHANGE SHUTTER SPEED       *EX 2ND R/O DR ON RTC
TIME    MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
           . *PREDICTED DSS 12 RISE
MISSION    .                      *UPDATE ATTITUDE REFERENCE
CONTROL    .                                      *SEND SPC SEQ TO DSS
EVENTS     .                                       *DSS HANDOVER PER ACE-2
           .                                        *FINAL COMD CONF--MAP 22
           .                                                                *TX PHOTO SPC--MAP 22
           .ISING DSS                                                                          *PREDICTED D
           .
TIME    MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
           .
FPAC       .
EVENTS     .
TIME    MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
.
. NOTES                                                 *FRAME 54                               ▷ NOTE:
.                                                       SITE V-10                                EARTHSAT
.           *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2---
S/C 9      .
EVENTS     .
----------.--------------------------------------------------------------------------------------------------
S/C 6      .
EVENTS     .
----------.--------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233      TIME01434
```

```
MISSN PHASE ORBITAL        -- ORBIT  31  --
EARTH OCC .OOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOO
DSS VIEW 41
          62
          12   GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .--------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO---------------------
GMT    DAY.             223                           224                           224
TIME   HRS.              23                             0                             1
       MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
           .                        *UPDATE ATT REF                                                 *STOP R
           . READOUT                  *STOP FILM PROCESSING
SPACECRAFT.*START ORBIT                                *ATT CHG
EVENTS     .    *EX READOUT PREP RTCS                        *TAKE   4
           .       *EX 2ND R/O DR ON RTC                       *REVERSE ATT
           .           *STOP READOUT                             *PITCH OFF-SUN
           .                *EX CHANGE SHUTTER SPEED              *EX READOUT PREP RTCS
           .                    *PROC   2                            *EX 2ND R/O DR ON RTC
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
           .
MISSION    .                        *UPDATE ATTITUDE REFERENCE
CONTROL    .
EVENTS     .
           .
           .SS 62 SET
           .*PRELIM COMD CONF--MAP 23
           .     --PHOTO--
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
           .
FPAC       .
EVENTS     .
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
.
. NOTES
.          *APOLUNE
.                                                           *FRAMES 55-58
.                                                             SITE V-11a
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
S/C 9      .
EVENTS     .
----------.---------------------------------------------------------------------------------------------------
S/C P      .
EVENTS     .
----------.---------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  32  --
EARTH OCC .OCCCOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE000000
DSS VIEW 41            W                                                                  WWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12        GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------------000000C0C00000000000C00000--------------------
GMT    DAY.          224                             224                            224
TIME   HRS.           2                               3                              4
       MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
          .EADOUT                          *EX CHANGE SHUTTER SPEED                *EX TELEMETER MEMORY 101
          .*START ORBIT                                *ATT CHG                                   *STOP READ
SPACECRAFT.     *EX READOUT PREP RTCS                        *TAKE   4                             *PROC   2
EVENTS    .        *EX 2ND R/O DR ON RTC                       *REVERSE ATT                              *STO
          .                  *STOP READOUT                        *PITCH OFF-SUN
          .                   *PROC    2                          *EX READOUT PREP RTCS
          .                        *STOP FILM PROCESSING             *EX 2ND R/C DR ON RTC
          .                        *UPDATE ATT REF                    *STORE COMMANDS
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
          .                                                *ACE-2 BRIEF RISING DSS
MISSION   .                                                            *TX PHOTO SPC--MAP 23
CONTROL   . *S/C STATUS MSG TO RISING DSS                                                                 *DS
EVENTS    .          *PREDICTED DSS 41 RISE
          .                        *UPDATE ATTITUDE REFERENCE
          .                                   *SEND SPC SEQ TO DSS
          .                                     *FINAL COND CONF--MAP 23
          .
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
          .
FPAC      .
EVENTS    .
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
.
. NOTES     *APOLUNE
.                                                       *FRAMES 59-62
.                                                        SITE V-11b
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

347

```
MISSN PHASE ORBITAL        -- ORBIT  33  --
EARTH OCC .OCCCOCCOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEFOOOOOOO
DSS VIEW 41         WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12         GGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .------------------------------------------------COOOOOOCCOOOOCCCCCCCCOOOC--------------------
GMT    DAY.   224                          224                          224                          22
TIME   HRS.    5                            6                            7
       MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .---                   *STOP READOUT                  *EX 2ND R/C DR ON RTC
          .OUT                     *UPDATE ATT REF                                             *STOP READO
SPACECRAFT.                                         *ATT CHG                                    *PROC   2
EVENTS    .P FILM PROCESSING                              *TAKE   1                                  *STOP
          .*START ORBIT                                     *REVERSE ATT
          .           *EX READOUT PREP RTCS                    *PITCH OFF-SUN
          .           *EX CHANGE SHUTTER SPEED                 *EX ROT ANT 1 DEG RT RTC 4 TIMES
          .              *EX 2ND R/O DR ON RTC                  *EX READOUT PREP RTCS
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
MISSION   .
CONTROL   .S HANDOVER PER ACE-2
EVENTS    .*PRELIM COMD CONF--MAP 24
          .   --PHOTO--
          .                        *UPDATE ATTITUDE REFERENCE
          .                          *PREDICTED DSS 12 SET
          .
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
FPAC      .
EVENTS    .
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
.
. NOTES                                           *FRAME 63
.
.         *APOLUNE                                  SITE V-12
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  34  --
EARTH CCC .OOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOO
DSS VIEW 41            WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC  .-------------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOOO---------------------
                                 224                    224                    224
GMT      DAY.4                    9                      10                     11
TIME     HRS.8
         MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1
                                 *STOP READOUT                *EX 2ND R/O DR ON RTC
         .                            *EX CHANGE SHUTTER SPEED          *STORE COMMANDS
         .UT                                   *ATT CHG                              *STOP READO
SPACECRAFT.                                          *TAKE   1                        *PROC   2
EVENTS   . FILM PROCESSING                            *REVERSE ATT                          *STOP
         .*START ORBIT                                   *PITCH OFF-SUN
         .         *EX READOUT PREP RTCS                  *EX CHANGE SHUTTER SPEED
         .            *EX 2ND R/O DR ON RTC               *EX READOUT PREP RTCS
         .                *UPDATE ATT REF
TIME     MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1
                          *UPDATE ATTITUDE REFERENCE
         .                               *SEND SPC SEQ TO DSS
MISSION  .                                 *FINAL COMD CONF--MAP 24
CONTROL  .                                                          *TX PHOTO SPC--MAP 24
EVENTS   .
         .
         .
         .
         .
TIME     MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1
         .
FPAC     .
EVENTS   .
TIME     MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1
.
. NOTES
.          *APOLUNE
.                                                *FRAME 64
.                                                 SITE V-13
.
.
.
.
.
.
.
.
.
.
.
TIME     MIN.0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1
S/C 9    .
EVENTS   .-------------------------------------------------------------------------------------------------
---------.
S/C 3    .
EVENTS   .-------------------------------------------------------------------------------------------------
---------.
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  35  --
EARTH OCC .OOOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOO
DSS VIEW 41           WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62                                                     M                MMMMMMMMMM
          12
CAN OCC   .---------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOOOO-----------------------
GMT    DAY.                    224                          224                          224
TIME   HRS.                     12                           13                           14
       MIN.----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .                  *REVERSE ATT                   *EX READOUT PREP RTCS
          .                     *PITCH OFF-SUN              *PITCH OFF-SUN
SPACECRAFT.UT                       *UPDATE ATT REF            *EX 2ND R/O DR ON RTC
EVENTS    .                            *EX CHANGE SHUTTER SPEED                            *STOP READOUT
          . FILM PROCESSING              *EX ROT ANT 1 DEG RT RTC 3 TIMES                    *PROC   2
          .*START ORBIT                              *ATT CHG                                     *STOP
          .            *ATT CHG                            *TAKE   4
          .                  *TAKE    1                    *REVERSE ATT
TIME   MIN.----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .                         *UPDATE ATTITUDE REFERENCE
MISSION   .                                                   *PREDICTED DSS 62 RISE
CONTROL   .                                                     *ACE-2 BRIEF RISING DSS
EVENTS    .                                                                                    *PREDICT
          .*PRELIM COMD CONF--MAP 25                                                             *DSS H
          .   --PHOTO--
          .              *S/C STATUS MSG TO RISING DSS
          .
TIME   MIN.----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .
FPAC      .
EVENTS    .
TIME   MIN.----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
.
. NOTES     *APOLUNE
.                    *FRAME 65
.                                                         *FRAMES 66-69
.                    SITE A-18.1
.                                                          SITE V-14
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  36  --
EARTH OCC .OOCCOOCOCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOCCOOCOOOOO
DSS VIEW 41
         62        MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .---------------------------------------------------OOOOOOCCOOCCCOOOCCOOOOOOOO-------------------
GMT    DAY.              224                          224                          224
TIME   HRS.               15                           16                           17
       MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3-
          .               *EX 2ND R/O DR ON RTC                  *PITCH OFF-SUN
          .                           *UPDATE ATT REF               *EX 2ND R/O DR ON RTC
SPACECRAFT.                            *STOP READOUT                  *STORE COMMANDS
EVENTS    .                                  *EX ROT ANT 1 DEG RT RTC 3 TIMES              *STOP READOUT
          .                                            *ATT CHG                             *PROC   3
          .FILM PROCESSING                                  *TAKE   1                               *STO
          .*START ORBIT                                       *REVERSE ATT
          .            *EX READOUT PREP RTCS                      *EX READOUT PREP RTCS
TIME   MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3-
          .                                       *FINAL COMD CONF--MAP 25
MISSION   .                                                         *TX PHOTO SPC--MAP 25
CONTROL   .
EVENTS    .ED DSS 41 SET
          .ANDOVER PER ACE-2
          .                           *UPDATE ATTITUDE REFERENCE
          .                                     *SEND SPC SEQ TO DSS
          .
TIME   MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3-
          .
FPAC      .
EVENTS    .
TIME   MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3-
.
. NOTES    *APOLUNE
.                                                          *FRAME 70
.                                                           SITE V-15.1
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3-
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233      TIME01759
```

```
MISSN PHASE CFBITAL        -- CRBIT  37  --
EARTH OCC .CCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOCCOOOOOOOO
DSS VIEW 41
         62             MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC  .--------------------------------------------------CCOOOOOOOOOOOOOOOOOOOOOOOC---------------------
GMT    DAY.            224                           224                          224
TIME   HRS.             18                            19                           20
       MIN.---4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .                *EX 2ND R/O OR ON RTC                 *EX 2ND R/O OR ON RTC
          .                         *STOP READOUT                                                   *STOP READOUT
SPACECRAFT.                         *UPDATE ATT REF
EVENTS    .                                          *ATT CHG
          .                                                *TAKE   4
          .P FILM PROCESSING                                 *REVERSE ATT
          .*START CRBIT                                       *EX READOUT PREP RTCS
          .             *EX READOUT PREP RTCS                  *PITCH OFF-SUN
TIME   MIN.---4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
MISSION   .
CONTROL   .                         *UPDATE ATTITUDE REFERENCE
EVENTS    .                                                *S/C STATUS MSG TO RISING DSS
          .                                                                                             *A
          .                                                                                             *
          .
          .
TIME   MIN.---4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
FPAC      .
EVENTS    .
TIME   MIN.---4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
.
. NOTES                                                    *FRAMES 71-74
.                                                          SITE V-16a
.         *APCLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  38  --
EARTH OCC .CCCCOOCCCCOCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOOO
DSS VIEW 41
         62              MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12              GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .---------------------------------------------------CCCOCOCCCCOCCCCCCCCCCCCCC----------------------
GMT    DAY.       224                           224                           224
TIME   HRS.       21                            22                            23
       MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5--
          .                            *UPDATE ATT REF           *EX READOUT PREP RTCS
          .                                 *EX CHANGE SHUTTER SPE*PITCH OFF-SUN
SPACECRAFT.*START ORBIT                     *EX CHANGE SHUTTER SPEED *EX 2ND R/O OR ON RTC
EVENTS    .          *PROC   3              *EX CHANGE SHUTTER SPEED                          *STOP READOUT
          .                *STOP FILM PROCE*EX ROT ANT 1 DEG RT RTC 4 TIMES
          .                *EX READOUT PREP RTCS    *ATT CHG
          .                   *EX 2ND R/O OR ON RTC       *TAKE    4
          .                        *STOP READOUT           *REVERSE ATT
TIME   MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5--
          .           *PREDICTED DSS 12 RISE
MISSION   .                    *UPDATE ATTITUDE REFERENCE
CONTROL   .                           *DSS HANDOVER PER ACE-2
EVENTS    .                                                 *PREDICTED DSS 62 SET
          .CE-2 BRIEF RISING DSS
          .PRELIM CCMD CONF--MAP 26
          .  --PHOTO--
          .
TIME   MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5--
          .
FPAC      .
EVENTS    .
TIME   MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5--
.
. NOTES
.         *APOLUNE
.                                                          *FRAMES 75-78
.                                                           SITE V-166
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01759
```

```
MISSN PHASE CRBITAL        -- CRBIT  39  --
EARTH OCC .CCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCCCCCCCCCCCCC
DSS VIEW 41
          62
          12                 GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC----------------------
GMT    DAY.225                         225                            225                            225
TIME   HRS.  C                          1                              2                              3
       MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
          .                       *PROC   2              *STORE COMMANDS
          .                            *STOP FILM PROCESSING                       *STOP READOUT
SPACECRAFT.                               *UPDATE ATT REF                            *ATT CHG
EVENTS    .                                   *EX PITCH PLUS X DEG RTC X=38.               *TAKE   1
          .*START ORBIT                         *EX COARSE S/S ON RTC Y+P                    *REVERSE ATT
          .                 *EX READOUT PREP RTCS   *EX FINE S/S OFF RTC Y+P                   *PITCH OFF-SU
          .                    *EX 2ND R/O DR ON RTC *EX READOUT PREP RTCS
          .                           *STOP READOUT      *EX 2ND R/O DR ON RTC
TIME   MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
          .                                              *TX PHOTO SPC--MAP 26
MISSION   .                                                                             *S/C STATUS MSG TO
CONTROL   .
EVENTS    .
          .                               *UPDATE ATTITUDE REFERENCE
          .                                 *SEND SPC SEQ TO DSS
          .                                   *FINAL COMD CONF--MAP 26
          .
TIME   MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
          .
FPAC      .
EVENTS    .
TIME   MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
.
. NOTES     *APOLUNE
.                                                                                         *FRAME 79
.                                                                                          SITE A-19
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
S/C 9     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL          -- ORBIT  40  --
EARTH CCC .OOCCOOOOOOOCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCOCCOOOOOOOOO
DSS VIEW 41                W                                        WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12                GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------CCCOOOOOOOOOOOOOOOOOOOOOOO---------------------
GMT    DAY.                          225                           225                           225
TIME   HRS.                           4                             5                             6
       MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .                *EX 2ND R/O DR ON RTC
          .                                 *STOP READOUT
SPACECRAFT.                                  *PROC    2
EVENTS    .                                      *STOP FILM PROCESSING
          .                                      *EX READOUT PREP RTCS
          .N                                        *EX 2ND R/O DR ON RTC
          .*START ORBIT                                                                        *STOP READOUT
          .             *EX READOUT PREP RTCS
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
MISSION   .RISING DSS
CONTROL   .           *PREDICTED DSS 41 RISE
EVENTS    .                        *ACE-2 BRIEF RISING DSS
          .                                                         *DSS HANDOVER PER ACE-2
          .                                                                                  *PREDICTED DS
          .
          .
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
          .
FPAC      .
EVENTS    .
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
.
. NOTES
.
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1---
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL       -- ORBIT  41  --
EARTH OCC .OCCCCCCOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEFOOOCOOOOOOOOOO
DSS VIEW 41               WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC  .-------------------------------------------------CCOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT    DAY.                225                           225                           225
TIME   HRS.                 7                             8                             9
       MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
           .              *PROC   2                     *TAKE   4
           .                 *EX READOUT PREP RTCS        *REVERSE ATT
SPACECRAFT.                   *STOP FILM PROCESSING         *EX READOUT PREP RTCS
EVENTS     .                   *EX 2ND R/O DR ON RTC         *PITCH OFF-SUN
           .                          *STOP READOUT            *EX 2ND R/O DR ON RTC
           .                          *UPDATE ATT REF                                   *STOP READOUT
           .                               *EX CHANGE SHUTTER SPEED
           .*START ORBIT                            *ATT CHG
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
           .
MISSION    .                          *UPDATE ATTITUDE REFERENCE
CONTROL    .
EVENTS     .
           .
           .S 12 SET
           .*PRELIM COMD CONF--MAP 27
           .    --PHOTO--
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
           .
FPAC       .
EVENTS     .
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
.
. NOTES     *APOLUNE
.                                                      *FRAMES 80-83
.                                                       SITE V-18
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
S/C 9      .
EVENTS     .
-----------.---------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
-----------.---------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  42  --
EARTH OCC .OCCCCCCCCCCCCCCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECOOOOOOOOOOO
DSS VIEW 41                WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC  .--------------------------------------------------CCCCCCOOOOCOOOOOOOOOOOOOOO-----------------------
GMT    DAY.            225                          225                           225
TIME   HRS.             10                           11                            12
       MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
         .                     *STOP FILM PROCESSING               *EX 2ND R/O OR ON RTC
         .                        *EX ROT ANT 1 DEG RT RTC 6 TIMES    *STORE COMMANDS
SPACECRAFT.                       *UPDATE ATT REF                                            *STOP READOUT
EVENTS   .                                         *ATT CHG
         .                                               *TAKE   1
         .                                                 *REVERSE ATT
         .*START ORBIT                                       *EX READOUT PREP RTCS
         .              *PROC   2                             *PITCH OFF-SUN
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
         .
MISSION  .
CONTROL  .                        *UPDATE ATTITUDE REFERENCE
EVENTS   .                                       *SEND SPC SEQ TO DSS
         .                                         *FINAL COND CONF--MAP 27
         .                                                         *TX PHOTO SPC--MAP 27
         .                                                                                  *S/C STA
         .
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
         .
FPAG     .
EVENTS   .
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
.
. NOTES                                                *FRAME 84
.
.         *APOLUNE                                     SITE V-19
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01759
```

```
MISSN PHASE CRBITAL       -- CRBIT  43  --
EARTH CCC .OCCOOCCOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOCOOOOOOOOOOO
DSS VIEW 41               WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62                                                    MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN OCC   .-------------------------------------------------COOOCCOOOCCCOOOCCOOCCCCOOC---------------------
GMT    DAY.          225                          225                          225
TIME   HRS.           13                           14                           15
       MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .                                        *EX READOUT PREP RTCS
          .                                         *STOP FILM PROCESSING
SPACECRAFT.                                           *EX 2ND R/O OR ON RTC
EVENTS    .*START CRBIT                                                                 *STOP READOUT
          .                 *EX READOUT PREP RTCS
          .                    *EX 2ND R/O OR ON RTC
          .                                 *STOP READOUT
          .                                  *PROC   2
TIME   MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .*PRELIM COMD CONF--MAP 2Y
MISSION   .   --PHCTO--
CONTROL   .                                   *ACE-2 BRIEF RISING DSS
EVENTS    .                                                  *PREDICTED DSS 62 RISE
          .                                                               *DSS HANDOVER PER ACE-2
          .                                                                              *PREDICTED DSS
          .TUS MSG TO RISING DSS
          .
TIME   MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .
FPAC      .
EVENTS    .
TIME   MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
.
. NOTES
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  44  --
EARTH OCC .OCCOOOOOOOCCOOOCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOOOO
DSS VIEW 41
          62            MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12
CAN OCC   .-------------------------------------------------------OCCOOOOOOOOOOOOOOOOOOOOOOOOO--------------------------
GMT    DAY.  225                            225                            225                            225
TIME   HRS.   16                             17                             18                             19
       MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
          .                                 *EX CHANGE SHU*EX 2ND R/O OR ON RTC
          .                                   *EX CHANGE SHU*STORE COMMANDS
SPACECRAFT.                                     *EX CHANGE SHUTTER SPEED          *STOP READOUT
EVENTS    .                                       *EX PITCH PLUS X DEG RTC X= 38.    *ATT CHG
          .*START ORBIT                             *EX COARSE S/S ON RTC Y+P             *TAKE   1
          .                      *PROC   4          *EX FINE S/S OFF RTC Y+P                *REVERSE ATT
          .                                *STOP FILM *EX ROT ANT 1 DEG RT RTC 3 TIMES          *PITCH OFF-S
          .                                *UPDATE ATT *EX READOUT PREP RTCS
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
          .                                      *SEND SPC SEQ TO DSS
MISSION   .                                        *FINAL COND CONF--MAP 28
CONTROL   .                                                 *TX PHOTO SPC--MAP 28
EVENTS    .
          .
          . 41 SET
          .                                *UPDATE ATTITUDE REFERENCE
          .
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
          .
FPAC      .
EVENTS    .
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
.
. NOTES                                                                                 *FRAME 85
.
.          *APOLUNE                                                                      SITE A-20
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0
S/C 9     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.           DAY 233      TIPE01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  45  --
EARTH OCC .CCCCCCCCOOCOCOCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE0000000000000
DSS VIEW 41
         62                 MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                                                                                   G
CAN OCC   .-------------------------------------------------CCOCOCCCCOCOCCOCCCCOCCOOOO------------------------
GMT    DAY.                       225                          225                          225
TIME   HRS.                        20                           21                           22
       MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .               *PROC   2                          *TAKE    4
          .                    *EX READOUT PREP RTCS            *REVERSE ATT
SPACECRAFT.                    *STOP FILM PROCESSING              *EX READOUT PREP RTCS
EVENTS    .                       *EX 2ND R/O DR ON RTC            *PITCH OFF-SUN
          .                                 *STOP READOUT            *EX 2ND R/O DR ON RTC
          .                                  *UPDATE ATT REF                             *STOP READOUT
          .UN                                    *EX CHANGE SHUTTER SPEED                      *PROC   2
          .*START ORBIT                                   *ATT CHG                                  *STOP
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .                                                                       *PREDICTED DSS 12 R
MISSION   .
CONTROL   .
EVENTS    .  *PRELIM COMD CONF--MAP 29
          .     --PHOTO--
          .                                  *UPDATE ATTITUDE REFERENCE
          .                                                   *S/C STATUS MSG TO RISING DSS
          .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
FPAC      .
EVENTS    .
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
.
. NOTES
.          *APOLUNE
.                                                            *FRAMES 86-89
.                                                             SITE V-21
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL       -- ORBIT  46  --
EARTH OCC  .OCCCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECOOOCOOCOCOOOO
DSS VIEW 41
         62                          MMMMMMMMMP
         12                          GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .------------------------------------------------COCOCCOOCOOOCOOCOCOCOCOOO-----------------------
GMT    DAY.                               225                           226                          226
TIME   HRS.                                23                             0                            1
       MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
           .*START ORBIT                                        *REVERSE ATT
           .                                *UPDATE ATT REF        *EX READOUT PREP RTCS
SPACECRAFT.                                *EX ROT ANT 1 DEG RT*PITCH OFF-SUN
EVENTS     .                                      *EX CHANGE SHUTTER S*EX 2ND R/O DR ON RTC
           .                                      *EX CHANGE SHUTTER SPEED*STORE COMMANDS
           .                                      *EX CHANGE SHUTTER SPEED                 *PROC   2
           .                                            *ATT CHG                            *STOP READOUT
           . FILM PROCESSING                                  *TAKE    4                       *STOP FILM PR
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
           .ISE                                                     *TX PHOTO SPC--MAP29
MISSION    .  *ACE-2 BRIEF RISING DSS
CONTROL    .                  *DSS HANDOVER PER ACE-2
EVENTS     .                      *PREDICTED DSS 62 SET
           .                           *UPDATE ATTITUDE REFERENCE
           .                                   *SEND SPC SEQ TO DSS
           .                                     *FINAL COMD CONF--MAP29
           .
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
           .
FPAC       .
EVENTS     .
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES     *APOLUNE
.                                                           *FRAMES 90-93
.                                                            SITE V-22
.
.                                         4 TIMES
.
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9      .
EVENTS     .
----------.-------------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.-------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  47  --
EARTH OCC .CCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCCCCCCCCCCC
DSS VIEW 41                                                                                      W
         62
         12                    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO---------------------
GMT    DAY.                226                           226                          226
TIME   HRS.                 2                             3                            4
       MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .*START ORBIT                                  *REVERSE ATT
          .                  *EX READOUT PREP RTCS         *EX READOUT PREP RTCS
SPACECRAFT.                     *EX 2ND R/O DR ON RTC        *PITCH OFF-SUN
EVENTS    .                            *STOP READOUT           *EX 2ND R/O DR ON RTC
          .                            *UPDATE ATT REF                                  *STOP READOUT
          .                                 *EX CHANGE SHUTTER SPEED                    *PROC   2
          .                                         *ATT CHG                                 *STOP FILM
          .OCESSING                                      *TAKE   4
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
MISSION   . *PRELIM COMD CONF--MAP 30
CONTROL   .    --PHOTO--
EVENTS    .                            *UPDATE ATTITUDE REFERENCE
          .                                                *S/C STATUS MSG TO RISING DSS
          .                                                                   *PREDICTED DSS 41 RISE
          .
          .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
FPAC      .
EVENTS    .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
.
. NOTES                                                  *FRAMES 94-97
.
.         *APOLUNE                                        SITE V-23.1
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  48  --
EARTH OCC  .OOOOOOOOOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOOOO
DSS VIEW 41                     WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12                     GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .-----------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT   DAY.          226                         226                         226
TIME  HRS.            5                           6                           7
      MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
           .                    *EX READOUT PREP RTCS           *PITCH OFF-SUN
           .                       *EX 2ND R/O DR ON RTC         *EX READOUT PREP RTCS
SPACECRAFT.                            *STOP READOUT                *EX 2ND R/O DR ON RTC
EVENTS     .                            *UPDATE ATT REF                       *STORE COMMANDS
           .                                 *EX ROT ANT 1 DEG RT RTC 4 TIMES                 *STOP READOUT
           .                                       *ATT CHG
           .PROCESSING                                   *TAKE   4
           .*START ORBIT                                    *REVERSE ATT
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
           .                            *UPDATE ATTITUDE REFERENCE
MISSION    .                                      *SEND SPC SEQ TO DSS
CONTROL    .                                        *FINAL COMD CONF--MAP 30
EVENTS     .                                             *DSS HANDOVER PER ACE-2
           .                                                          *TX PHOTO SPC--MAP 30
           .                                                                    *PREDICTED DSS 12 SET
           .  *ACE-2 BRIEF RISING DSS
           .
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
           .
FPAC       .
EVENTS     .
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
.
. NOTES
.          *APOLUNE
.                                                *FRAMES 95-101
.                                                 SITE II-24
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
S/C 9      .
EVENTS     .
----------.---------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
----------.---------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.C.            DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  49  --
EARTH CCC .CCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCCCCCCCCCCCC
DSS VIEW 41                WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN CCC   .------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT    DAY.    226                            226                          226                            2
TIME   HRS.     8                              9                           10
       MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .                  *STOP FILM PROCESSING                      *EX CHANGE SHUTTER S*REVERSE ATT
          .                   *EX 2ND R/O DR ON RTC                      *EX CHANGE SHUTTER SPE*PITCH OFF-S
SPACECRAFT.                              *STOP READOUT                   *EX CHANGE SHUTTER SPEED
EVENTS    .                                *UPDATE ATT REF                *EX READOUT PREP RTCS
          .                                              *ATT CHG           *EX 2ND R/O DR ON RTC
          .*START ORBIT                                        *TAKE   1          *STOP READOUT
          .          *PROC   3                                   *REVERSE ATT     *ATT CHG
          .                 *EX READOUT PREP RTCS                  *PITCH OFF-SUN       *TAKE   1
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
MISSION   .                                *UPDATE ATTITUDE REFERENCE
CONTROL   .
EVENTS    .
          .
          .
          . *PRELIM COMD CONF--MAP 31
          .     --PHOTO--
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
FPAC      .
EVENTS    .
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
.
. NOTES    *APOLUNE
.                                                             *FRAME 102
.                                                              SITE V-25                *FRAME 103
.                                                                                        SITE A-21
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233       TIME01759
```

```
MISSN PHASE CRBITAL        -- CRBIT  50  --
EARTH OCC .CCCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECCCCCCCCCCCC
DSS VIEW 41                    WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN CCC  .-----------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC----------------------
GMT    DAY.26                              226                            226                             226
TIME   HRS.11                               12                             13                              14
       MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
           .                                 *UPDATE ATT REF                                 *STOP READOUT
           .UN                                            *ATT CHG
SPACECRAFT.*START ORBIT                                         *TAKE   4
EVENTS     .         *PRCC   4                                    *REVERSE ATT
           .                  *EX READOUT PREP RTCS                  *EX READOUT PREP RTCS
           .                   *STCP FILM PROCESSING                 *PITCH OFF-SUN
           .                     *EX 2ND R/O DR ON RTC                  *EX 2ND R/C DR ON RTC
           .                                *STOP READOUT                   *STORE COMMANDS
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
           .                                                                                        *PR
MISSION    .
CONTROL    .                                 *UPDATE ATTITUDE REFERENCE
EVENTS     .                                        *SEND SPC SEQ TO DSS
           .                                          *FINAL CCMD CONF--MAP 31
           .                                                              *TX PHOTO SPC--MAP 31
           .                                                                             *S/C STATUS M
           .
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
           .
FPAC       .
EVENTS     .
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
.
. NOTES     *APCLUNE
.                                                        *FRAMES 104-107
.                                                         SITE V-26
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0---
S/C 9      .
EVENTS     .
-----------.-----------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
-----------.-----------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIFE01759
```

```
MISSN PHASE ORBITAL       -- ORBIT  51  --
EARTH OCC .OCCOOCCOOCCOOOOCCCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOOC
DSS VIEW 41                    WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                                MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .---------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT     DAY.                         226                           226                          226
TIME    HRS.                         15                            16                           17
        MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .                                                 *TAKE   4
          .*START ORBIT                                      *REVERSE ATT
SPACECRAFT.               *PROC   2                            *PITCH OFF-SUN
EVENTS    .                    *STOP FILM PROCESSING                *EX READOUT PREP RTCS
          .                          *UPDATE ATT REF                   *EX 2ND R/O DR ON RTC
          .                               *EX CHANGE SHUTTER SPEED                        *STOP READOUT
          .                                    *EX ROT ANT 1 DEG RT RTC 5 TIMES           *PROC   2
          .                                          *ATT CHG                                   *STOP FIL
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .ELIM COMD CONF--MAP 32
MISSION   .--PHOTO--
CONTROL   .                          *UPDATE ATTITUDE REFERENCE
EVENTS    .                                *ACE-2 BRIEF RISING DSS
          .                                             *PREDICTED DSS 62 RISE
          .                                                     *DSS HANDOVER PER ACE-2
          .SG TO RISING DSS                                            *PREDICTED DSS 41 SET
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
FPAC      .
EVENTS    .
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
.
. NOTES                                                     *FRAMES 108-111
.                                                            SITE V-27a
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.-1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------. CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE CRBITAL        -- CRBIT  52  --
EARTH OCC .OCCCOOCCCCCCCUCCCUEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEECOOOOOOOOCOO
DSS VIEW 41
         62                  MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .--------------------------------------------------OCOOOOCOCCCCOOOCCCCOOOOOO----------------------
GMT    DAY.                  226                          226                          226
TIME   HRS.                   18                           19                           20
       MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
          .*START CRBIT                                    *EX READOUT PREP RTCS
          .                  *EX CHANGE SHUTTER SPEED      *PITCH OFF-SUN
SPACECRAFT.                  *EX CHANGE SHUTTER SPEED         *EX 2ND R/O DR ON RTC
EVENTS    .                  *EX CHANGE SHUTTER SPEED                 *STORE COMMANDS
          .                     *UPDATE ATT REF                                        *STOP READOUT
          .                                     *ATT CHG                                *PROC   4
          .                                          *TAKE    4                                   *STC
          .M PROCESSING                                *REVERSE ATT
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
          .                     *UPDATE ATTITUDE REFERENCE
MISSION   .                              *SEND SPC SEQ TO DSS
CONTROL   .                                *FINAL COMD CONF--MAP 32
EVENTS    .                                                           *TX PHOTO SPC--MAP 32
          .
          .
          .
          .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
          .
FPAC      .
EVENTS    .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
.
. NOTES
.          *APOLUNE
.                                                    *FRAMES 112-115
.                                                      SITE V-27b
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  53  --
EARTH OCC .OOOOOOOOOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOOO
DSS VIEW 41
         62                 MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                                                                   GGGGGGGGGGGGGGGG
CAN OCC   .------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT    DAY.              226                            226                            226
TIME   HRS.               21                             22                             23
       MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .                       *EX ROT ANT 1 DEG RT RTC 3 TIMES                       *STOP READOUT
          .                        *UPDATE ATT REF                                        *PROC   3
SPACECRAFT.                                       *ATT CHG                                        *STOP
EVENTS    .                                            *TAKE   4
          .                                              *REVERSE ATT
          .                                                 *EX READOUT PREP RTCS
          .P FILM PROCESSING                                *PITCH OFF-SUN
          .*START ORBIT                                        *EX 2ND R/O DR ON RTC
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .                        *UPDATE ATTITUDE REFERENCE
MISSION   .                                                   *ACE-2 BRIEF RISING DSS
CONTROL   .                                                                  *PREDICTED DSS 12 RISE
EVENTS    .                                                                          *DSS HANDOVER PER AC
          .    *PRELIM COMD CONF--MAP 33                                                    *PREDICTED DS
          .        --PHOTO--
          .       *S/C STATUS MSG TO RISING DSS
          .
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES    *APOLUNE
.                                               *FRAMES 116-119
.                                                SITE V-28
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 2     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  54  --
EARTH OCC .CCCCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOCCCCCCCCC
DSS VIEW 41
          62
          12                 GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT    DAY.         227                            227                            227
TIME   HRS.          0                              1                              2
       MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .                                             *ATT CHG                       *ATT CHG
          .                                                   *TAKE   4                      *TAKE   1
SPACECRAFT.FILM PROCESSING                                      *REVERSE ATT                   *REVERSE ATT
EVENTS    .*START ORBIT                                            *EX COARSE S/S OFF RTC Y+P    *PITCH OFF-S
          .                   *EX READOUT PREP RTCS                *EX FINE S/S ON RTC Y+P
          .                      *EX 2ND R/O CR ON RTC             *PITCH OFF-SUN
          .                             *STOP READOUT              *EX ACQUIRE SUN RTC
          .                              *UPDATE ATT REF            *STORE COMMANDS
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .                                              *FINAL COMD CONF--MAP 33
MISSION   .                                                         *TX PHOTO SPC--MAP 33
CONTROL   .
EVENTS    .E-2
          .S 62 SET
          .                              *UPDATE ATTITUDE REFERENCE
          .                                          *SEND SPC SEQ TO DSS
          .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .
FPAG      .
EVENTS    .
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
.
. NOTES                                                   *FRAMES 120-123
.                                                           SITE V-29                    *FRAME 124
.         *APCLUNE                                                                        SITE A-22
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  55  --
EARTH OCC .OCCCCCCCCCCOCOCOCOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOCOOOOOOOOOO
DSS VIEW 41                                                      W
          62
          12                GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .*-----------------------------------------------OOOOCOCOCOCOCOOOOOOOOOOOO---------------------
GMT    DAY.  227                     227                     227                     227
TIME   HRS.   3                       4                       5                       6
       MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                        *EX ROT ANT 1 DEG RT RTC 4 TIMES                        *PROC   3
          .                             *ATT CHG                                              *ST
SPACECRAFT.                                 *TAKE   4
EVENTS    .UN                                *REVERSE ATT
          .*START ORBIT                       *PITCH OFF-SUN
          .           *PROC   3                              *EX READOUT PREP RTCS
          .                *STOP FILM PROCESSING                 *EX 2ND R/O DR ON RTC
          .                *UPDATE ATT REF                             *STOP READOUT
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
MISSION   .
CONTROL   .                *UPDATE ATTITUDE REFERENCE
EVENTS    .                                          *S/C STATUS MSG TO RISING DSS
          .                                            *PREDICTED DSS 41 RISE
          .
          .
          .
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES                                *FRAMES 125-128
.                                       SITE V-30
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

370

```
MISSN PHASE ORBITAL        -- ORBIT  56  --
EARTH OCC .OOOOOOOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOO
DSS VIEW 41                  WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12               GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG  G
CAN OCC   .-----------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT    DAY.                    227                           227                           227
TIME   HRS.                     7                             8                             9
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .                                                     *TAKE   4
          .OP FILM PROCESSING                                     *REVERSE ATT
SPACECRAFT.*START ORBIT                                             *EX READOUT PREP RTCS
EVENTS    .                  *EX READOUT PREP RTCS                   *PITCH OFF-SUN
          .                     *EX 2ND R/O OR ON RTC                  *EX 2ND R/O OR ON RTC
          .                                *STOP READOUT                                    *STOP READOUT
          .                                   *UPDATE ATT REF
          .                                                *ATT CHG
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
MISSION   .              <-----------------*DSS HANDOVER PER ACE-2
CONTROL   .                                   *UPDATE ATTITUDE REFERENCE
EVENTS    .                                                   *PREDICTED DSS 12 SET
          .
          .   *ACE-2 BRIEF RISING DSS
          .   *PRELIM COMC CONF--MAP 34
          .      --PHOTO--
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
.
. NOTES
.          *APOLUNE
.                                                           *FRAMES 129-132
.                                                             SITE V-31
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  57  --
EARTH CCC .OCCCOOOOOCOCOCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOOOO
DSS VIEW 41                  WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN CCC   .--------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO-----------------------
GMT    DAY.                    227                            227                            227
TIME   HRS.                    10                             11                             12
       MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .                  *EX READOUT PREP RTCS              *REVERSE ATT                   *STOP READOUT
          .                   *STOP FILM PROCESSING               *PITCH OFF-SUN
SPACECRAFT.                     *EX 2ND R/O DR ON RTC               *EX CHANGE SHUTTER SPEED
EVENTS    .                              *STOP READOUT              *EX CHANGE SHUTTER SPEED
          .                              *UPDATE ATT REF            *EX CHANGE SHUTTER SPEED
          .                                   *EX CHANGE SHUTTER SPEE*EX READOUT PREP RTCS
          .*START ORBIT                                 *ATT CHG        *EX 2ND R/O DR ON RTC
          .        *PROC   4                                  *TAKE   4    *STORE COMMANDS
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .                                                                *TX PHOTO SPC--MAP34
MISSION   .
CONTROL   .
EVENTS    .
          .                              *UPDATE ATTITUDE REFERENCE
          .                                          *SEND SPC SEQ TO DSS
          .                                            *FINAL COMD CONF--MAP34
          .
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
FPAC      .
EVENTS    .
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES     *APCLUNE
.                                                         *FRAMES 133-136
.                                                          SITE V-32
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE CRBITAL        -- CRBIT  58  --
EARTH OCC .OOCOOOCOOOOOOOOCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOO
DSS VIEW 41                   WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC   .-------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOOO---------------------
GMT    DAY.                227                            227                            227
TIME   HRS.                 13                             14                             15
       MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .                                           *EX ROT ANT 1 DEG RT RTC 4 TIMES
          .*START ORBIT                                  *EX 2ND R/O DR ON RTC
SPACECRAFT.                *EX READOUT PREP RTCS                                               *STOP READOUT
EVENTS    .                   *EX 2ND R/O DR ON RTC                                             *PROC   3
          .                             *STOP READOUT                                                   *STO
          .                              *PROC   3
          .                                          *STOP FILM PROCESSING
          .                                           *EX READOUT PREP RTCS
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
MISSION   .   *PRELIM COMD CONF--MAP 35
CONTROL   .      --PHOTO--
EVENTS    .                                                                          *S/C STATUS MSG TO RIS
          .
          .
          .
          .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
FPAC      .
EVENTS    .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
.
. NOTES
.
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.             DAY 233      TIMEC1759
```

```
MISSN PHASE ORBITAL         -- ORBIT  59  --
EARTH OCC .OCCOOOOCOOOOOOCCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOOO
DSS VIEW 41                 WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                     MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .--------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT    DAY.          227                           227                          227
TIME   HRS.           16                            17                           18
       MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
          .                             *STOP READOUT                     *STORE COMMANDS
          .                             *UPDATE ATT REF                                       *STOP READOUT
SPACECRAFT.                                           *ATT CHG                                 *PROC   3
EVENTS    .                                                 *TAKE   1                                  *STO
          .P FILM PROCESSING                                  *REVERSE ATT
          .*START ORBIT                                          *PITCH OFF-SUN
          .                *EX READOUT PREP RTCS                 *EX READOUT PREP RTCS
          .                   *EX 2ND R/O DR ON RTC                 *EX 2ND R/O DR ON RTC
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
          .                                       *SEND SPC SEQ TO DSS
MISSION   .                                        *DSS HANDOVER PER ACE-2
CONTROL   .                                         *FINAL COMD CONF--MAP 35
EVENTS    .ING DSS                                      *PREDICTED DSS 41 SET
          .                   *ACE-2 BRIEF RISING DSS                     *TX PHOTO SPC--MAP 35
          .                         *UPDATE ATTITUDE REFERENCE
          .                                *PREDICTED DSS 62 RISE
          .
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
          .
FPAO      .
EVENTS    .
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
.
. NOTES    *APOLUNE
.                                                       *FRAME 137
.                                                        SITE IV-33
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  60  --
EARTH OCC .OOOOOOOOOOOOOOOOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOOOO
DSS VIEW 41
         62                MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC  .-----------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT   DAY.   227                          227                          227                               2
TIME  HRS.    19                           20                           21
      MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
         .                        *UPDATE ATT REF               *EX 2ND R/C OR ON RTC
         .                              *EX CANOPUS SENSOR ON RTC                              *STOP READOU
SPACECRAFT.                              *EX CANOPUS SENSOR OFF RTC                             *PROC   3
EVENTS   .P FILM PROCESSING                       *ATT CHG                                              *ST
         .*START ORBIT                                 *TAKE   4
         .                 *EX READOUT PREP RTCS         *REVERSE ATT
         .                    *EX 2ND R/C OR ON RTC         *PITCH OFF=SUN
         .                          *STOP READOUT            *EX READOUT PREP RTCS
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
         .                          *UPDATE ATTITUDE REFERENCE
MISSION  .                                                                                              *S/
CONTROL  .
EVENTS   .
         .
         .   *PRELIM CCMD CONF--MAP 36
         .      --PHOTO--
         .
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---

FPAC     .
EVENTS   .
TIME  .MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---

. NOTES                                                *FRAMES 138-141
.                                                        SITE V-34
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  61  --
EARTH OCC .OCCCCCCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOCCC
DSS VIEW 41
         62               MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                                                        GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-----------------------
GMT    DAY.27                         227                          228                            228
TIME   HRS.22                          23                           0                               1
       MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .                           *UPDATE ATT REF              *STORE COMMANDS
          .T                              *EX ROT ANT 1 DEG RT RTC 6 TIMES                *STOP READOUT
SPACECRAFT.                                         *ATT CHG                                     *PROC    4
EVENTS    .OP FILM PROCESSING                             *TAKE   4
          .*START ORBIT                                    *REVERSE ATT
          .                *EX READOUT PREP RTCS             *EX READOUT PREP RTCS
          .                  *EX 2ND R/O OR ON RTC           *PITCH OFF-SUN
          .                           *STOP READOUT            *EX 2ND R/O OR ON RTC
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .                                                    *TX PHOTO SPC--MAP 36
MISSION   .C STATUS MSG TO RISING DSS                                      *DSS HANDOVER PER ACE-2
CONTROL   .                            *UPDATE ATTITUDE REFERENCE                       *PREDICTED DS
EVENTS    .                                     *SEND SPC SEQ TO DSS
          .                                      *ACE-2 BRIEF RISING DSS
          .                                       *FINAL COMD CONF--MAP 36
          .                                                  *PREDICTED DSS 12 RISE
          .
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .
FPAC      .
EVENTS    .
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
.
. NOTES
.           *APOLUNE                                        *FRAMES 142-145
.                                                            SITE V-35
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCC
RUN I.D.            DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  62  --
EARTH OCC .OCCOOCCOOOCOCCOOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOOO
DSS VIEW 41
         62
         12                GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------OCCOOOCOOOCOOOCCCCCCCOOO---------------------
GMT    DAY.                      228                           228                           228
TIME   HRS.                       2                             3                             4
       MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .                             *UPDATE ATT REF
          .                                           *ATT CHG
SPACECRAFT.                                                *TAKE   4
EVENTS    .*START ORBIT                                      *REVERSE ATT
          . *STOP FILM PROCESSING                               *EX READOUT PREP RTCS
          .                   *EX READOUT PREP RTCS             *PITCH OFF-SUN
          .                      *EX 2ND R/O DR ON RTC             *EX 2ND R/C DR ON RTC
          .                              *STOP READOUT                                        *STOP RE
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
MISSION   .
CONTROL   .S 62 SET
EVENTS    .  *PRELIM COMD CONF--MAP 37
          .     --PHOTO--
          .                             *UPDATE ATTITUDE REFERENCE
          .
          .
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
FPAC      .
EVENTS    .
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
.
. NOTES    *APOLUNE
.                                                 *FRAMES 146-149
.                                                  SITE V-36
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIMEO1759
```

```
MISSN PHASE ORBITAL        -- ORBIT  63  --
EARTH OCC .OCCOOOCCCCCCCCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOOOO
DSS VIEW 41                                             W
         62
         12                 GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------OCCCCCCCCCCCCCCCCCCCCCCCC-------------------------
GMT    DAY.             228                          228                          228
TIME   HRS.              5                            6                            7
       MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .*START ORBIT                           *EX ROT ANT 1 DEG RT RTC 2 TIMES                     *STOP REA
          .   *PROC   4.4                                *ATT CHG
SPACECRAFT.             *STOP FILM PROCESSING                 *TAKE   8
EVENTS    .                *EX READOUT PREP RTCS                *REVERSE ATT
          .                   *EX 2ND R/O DR ON RTC                *EX READOUT PREP RTCS
          .                            *STOP READOUT               *PITCH OFF-SUN
          .                             *UPDATE ATT REF               *EX 2ND R/O DR ON RTC
          .ADOUT                             *EX CHANGE SHUTTER SPEE*STORE COMMANDS
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .                                         *SEND SPC SEQ TO DSS
MISSION   .                                            *FINAL COMD CONF--MAP 37
CONTROL   .                                            *PREDICTED DSS 41 RISE
EVENTS    .                                                   *S/C STATUS MSG TO RISING DSS
          .                                                           *TX PHOTO SPC--MAP 37
          .                                                                                               *
          .                             *UPDATE ATTITUDE REFERENCE
          .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
          .
FPAC      .
EVENTS    .
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NOTES                                                       *FRAMES 150-157
.                                                              SITE V-37
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233     TIME01759
```

```
MISSN PHASE CRBITAL          -- ORBIT  64  --
EARTH OCC .OCCCCCCCOOCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEOOO
DSS VIEW 41              WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12             GGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------------OOOOOOOOOOOOOOOOOOOOOOOO----------------------
GMT    DAY.            223                           228                          228
TIME   HRS.              3                             9                           10
       MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .DOUT                                    *EX COARSE S/S ON RTC Y+P      *STOP READOUT
          .*START ORBIT                            *EX FINE S/S OFF RTC Y+P         *ATT CHG
SPACECRAFT.              *EX READCUT PREP RTCS           *STOP FILM PROCESSING            *TAKE   1
EVENTS    .                 *EX 2ND R/O DR ON RTC         *EX CHANGE SHUTTER SPEED          *REVERSE ATT
          .                               *STOP READOUT  *EX CHANGE SHUTTER SPEED            *PITCH OFF-S
          .                               *UPDATE ATT REF *EX READCUT PREP RTCS
          .                                   *PROC 3.7   *EX CHANGE SHUTTER SPEED
          .                                                  *EX 2ND R/C DR ON RTC
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
MISSION   .                        *DSS HANDOVER PER ACE-2
CONTROL   .                               *UPDATE ATTITUDE REFERENCE
EVENTS    .                                   *PREDICTED DSS 12 SET
          .
          .ACE-2 BRIEF RISING DSS
          .   *PRELIM COND CONF--MAP 38
          .      --PHOTO--
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES
.          *APOLUNE
.                                                                                        *FRAME 158
.                                                                                        SITE A-23
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  65  --
EARTH OCC .OCCCCOCCCOOCCOEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEO
DSS VIEW 41             WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC   .-----------------------------------------------0000000000000CCCCCCCCCCCC0000--------------------------
GMT  DAY.       228                         228                         228
TIME HRS.        11                          12                          13
     MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .               *EX READOUT PREP RTCS                   *EX READOUT PREP RTCS
          .                  *EX 2ND R/O OR ON RTC                 *PITCH OFF-SUN
SPACECRAFT.                              *STOP READOUT                *EX 2ND R/O OR ON RTC
EVENTS    .                               *UPDATE ATT REF                  *STORE COMMANDS
          .UN                                  *EX ROT ANT 1 DEG RT RTC 4 TIMES                  *STOP
          .*START ORBIT                                  *ATT CHG
          .        *PROC   2                                   *TAKE    4
          .             *STOP FILM PROCESSING                    *REVERSE ATT
TIME MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .                                                             *TX PHOTO SPC--MAP38
MISSION   .
CONTROL   .
EVENTS    .
          .                               *UPDATE ATTITUDE REFERENCE
          .                                        *SEND SPC SEQ TO DSS
          .                                          *FINAL COMD CONF--MAP 38
          .
TIME MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
          .
FPAC      .
EVENTS    .
TIME MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
.
. NOTES    *APOLUNE
.                                                          *FRAMES 159-162
.                                                           SITE V-38
.
.
.
.
.
.
.
.
.
.
.
.
TIME MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL        -- ORBIT  66  --
EARTH OCC .CCCCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE:O
DSS VIEW 41            WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC   .------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-----------------------
GMT     DAY.  228                          228                          228                          228
TIME    HRS.   14                           15                           16                           17
        MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                        *STOP READOUT
          .                         *PROC   3
SPACECRAFT.                               *EX READOUT PREP RTCS
EVENTS    .                                *STOP FILM PROCESSING
          . READOUT                          *EX 2ND R/O OR ON RTC
          .*START ORBIT                                                                              *ST
          .            *EX READOUT PREP RTCS
          .               *EX 2ND R/O OR ON RTC
TIME    MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
MISSION   .         *PRELIM COMD CONF--MAP 37
CONTROL   .            --PHOTO--
EVENTS    .                                                       *S/C STATUS MSG TO RISING DSS
          .
          .
          .
          .
TIME    MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME    MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES
.
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME01759
```

```
MISSN PHASE ORBITAL         -- ORBIT  67  --
EARTH OCC .CCCCCCCCCCEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41          WWWWWWWWWWWWWWWWWWWWWWWW
         62                      MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .--------------------------------------------------OCCCCCCCCCCCCCCCCCCCCCCCCO------------------------
GMT    DAY.                          228                           228                            228
TIME   HRS.                           18                            19                             20
       MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .            *EX 2ND R/O OR ON RTC                   *EX READOUT PREP RTCS             *EX READOUT
          .                       *STOP READOUT                   *EX 2ND R/O OR ON RTC              *EX 2ND
SPACECRAFT.                               *UPDATE ATT REF            *STORE COMMANDS
EVENTS    .                                     *PROC    4                        *STOP READOUT
          .                                                *STOP FILM PROCESSING     *ATT CHG
          .CP READOUT                                       *EX PITCH PLUS X DEG RTC X=38.  *TAKE   1
          .*START ORBIT                                       *EX COARSE S/S ON RTC Y+P       *REVERSE ATT
          .         *EX READOUT PREP RTCS                     *EX FINE S/S OFF RTC Y+P           *PITCH OFF-
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .                               *UPDATE ATTITUDE REFERENCE
MISSION   .                                *PREDICTED DSS 41 SET
CONTROL   .                                              *SEND SPC SEQ TO DSS
EVENTS    .                                                *FINAL COMD CONF--MAP 39
          .       *ACE-2 BRIEF RISING DSS                            *TX PHOTO SPC--MAP 39
          .                      *PREDICTED DSS 62 RISE
          .                           *DSS HANDOVER PER ACE-2
          .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
          .
FPAC      .
EVENTS    .
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
.
. NOTES     *APOLUNE
.                                                                                            *FRAME 163
.                                                                                             SITE A-24
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME01759
```

```
MISSN PHASE ORBITAL          -- CRBIT  69  --
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW  41
           62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
           12
CAN OCC    .----------------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT   DAY.                       228                          228                          228
TIME  HRS.                       21                           22                           23
      MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .*START CRBIT
          .                              *STOP READCUT
SPACECRAFT.                               *PRCC    4
EVENTS    .                                         *STOP FILM PROCESSING
          .                                          *EX READOUT PREP RTCS
          .SUN                                       *EX ROT ANT 1 DEG RT RTC N TIMES
          . PREP RTCS                                   *EX 2ND R/C DR ON RTC
          .R/C DR ON RTC
TIME  MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .                                                                                   *S/C STATUS MSG TC
MISSION   .
CONTROL   .
EVENTS    .
          .
          .         *PRELIM COMD CONF--MAP 40
          .            --PHOTO--
          .
TIME  MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
FPAC      .
EVENTS    .
TIME  MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES
.  *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.---2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.C.        DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL        -- ORBIT  69  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                 GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT   DAY.               229                        229                        229
TIME  HRS.                0                          1                          2
      MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .                          *STOP READOUT              *EX READOUT PREP RTCS
          .                           *UPDATE ATT REF              *EX 2ND R/O DR ON RTC
SPACECRAFT.                                *PROC   3                           *STORE COMMANDS
EVENTS    .                                        *STOP FILM PROCESSING
          .                                         *ATT CHG
          .                                               *TAKE   4
          .                                                 *REVERSE ATT
          .*START ORBIT                                       *PITCH OFF-SUN
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          . RISING DSS                                                     *PREDICTED DSS 62 SET
MISSION   .                         *ACE-2 BRIEF RISING DSS                   *TX PHOTO SPC--MAP 40
CONTROL   .                            *UPDATE ATTITUDE REFERENCE
EVENTS    .                                        *PREDICTED DSS 12 RISE
          .                                            *SEND SPC SEQ TO DSS
          .                                              *FINAL COMD CONF--MAP 40
          .                                                      *DSS HANDOVER PER ACE-2
          .
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
          .
FPAC      .
EVENTS    .
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
.
. NOTES                                                *FRAMES 164-167
.                                                        SITE II-40
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3--
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIMEC2300
```

```
MISSN PHASE ORBITAL        -- ORBIT  70  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC  .------------------------------------------------------CCCC000000CCCCC00000000CCCCC---------------------
GMT   DAY.          229                       229                       229
TIME  HRS.           3                         4                         5
      MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
         .                                 *ATT CHG
         .                                      *TAKE   1
SPACECRAFT.                                      *REVERSE ATT
EVENTS   .*START ORBIT                              *PITCH OFF-SUN
         .                  *STOP READOUT              *EX READOUT PREP RTCS
         .                   *UPDATE ATT REF               *EX 2ND R/O OR CN RTC
         .                       *PROC   3
         .                          *STOP FILM PROCESSING
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---

MISSION  .
CONTROL  .*PRELIM COMD CONF--MAP 41
EVENTS   .   --PHOTO--
         .                   *UPDATE ATTITUDE REFERENCE
         .
         .
         .
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---

FPAC     .
EVENTS   .
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
.
. NOTES
.         *APOLUNE
.                                                *FRAME 168
.                                                SITE V-41
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL        -- ORBIT  71  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41.                          W                                                  WWWWWWWWWWWWW
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------
GMT   DAY.     229                           229                        229                          2
TIME  HRS.       6                             7                          8
      MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .                    *EX ROT ANT 3 DEG RT RTC      *PITCH OFF-SUN
          .                    *UPDATE ATT REF                    *EX READOUT PREP RTCS
SPACECRAFT.                          *PROC   3                       *EX 2ND R/C DR ON RTC
EVENTS    .                           *EX ROT ANT 1 DEG RT RTC 5 TIMES                          *STORE C
          .                                  *STOP FILM PROCESSING
          .                                     *ATT CHG
          .*START ORBIT                               *TAKE   4
          .                  *STOP READOUT              *REVERSE ATT
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .                        *PREDICTED DSS 41 RISE
MISSION   .                                 *SEND SPC SEQ TO DSS
CONTROL   .                                   *FINAL COMD CONF--MAP 41
EVENTS    .                                                            *ACE-2 BRIEF RISING DSS
          .                                                                            *TX PHOT
          .                  *S/C STATUS MSG TO RISING DSS
          .                     *UPDATE ATTITUDE REFERENCE
          .
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
          .
FPAC      .
EVENTS    .
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
.
. NOTES   *APOLUNE
.                                                 *FRAMES 769-772
.                                                  SITE V-42a
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5---
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME0230C
```

```
MISSN PHASE ORBITAL        -- ORBIT  72  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-----------------------------------------------------------OOOOOOOOOOCOOOOOOOOOOOOOO---------------------------
GMT   DAY.29                          229                             229                             229
TIME  HRS. 9                          10                              11                              12
      MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .                                       *STOP FILM PROCESSING
          .                                        *EX ROT ANT 1 DEG RT RTC 3 TIMES
SPACECRAFT.                                         *ATT CHG
EVENTS    .CMMANDS                                        *TAKE   4
          .*START ORBIT                                     *REVERSE ATT
          .                  *STOP READOUT                     *EX READOUT PREP RTCS
          .                   *UPDATE ATT REF                  *PITCH OFF-SUN
          .                             *PROC   3                *EX 2ND R/O DR ON RTC
TIME  MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .                     *PREDICTED DSS 12 SET
MISSION   .
CONTROL   .
EVENTS    .
          .C SPC--MAP 41
          .     *DSS HANDOVER PER ACE-2
          .                   *UPDATE ATTITUDE REFERENCE
          .
TIME  MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
          .
EPAC      .
EVENTS    .
TIME  MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
.
. NOTES                                                 *FRAMES 173-176
.                                                        SITE V-42b
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.-0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
S/C 9     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL        -- ORBIT  73  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC   .------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC----------------------
GMT   DAY.                  229                             229                             229
TIME  HRS.                   13                              14                              15
      MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .*START ORBIT                                    *PITCH OFF-SUN
          .                  *STOP READOUT                  *EX READOUT PREP RTCS
SPACECRAFT.                  *UPDATE ATT REF                   *EX 2ND R/O OR ON RTC
EVENTS    .                       *PROC   3
          .                              *STOP FILM PROCESSING
          .                                *ATT CHG
          .                                      *TAKE    4
          .                                        *REVERSE ATT
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
MISSION   . *PRELIM COMD CONF--MAP 42
CONTROL   .    --PHOTO--
EVENTS    .                  *UPDATE ATTITUDE REFERENCE
          .
          .
          .
          .
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
          .
EPAC      .
EVENTS    .
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
.
. NOTES
.        *APOLUNE
.                                                    *FRAMES 177-180
.
.                                                     SITE V-43.1
.
.
.
.
.
.
.
.
.
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME0230C
```

```
MISSN PHASE ORBITAL        -- ORBIT  74 --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12
CAN OCC  .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT  DAY.                229                          229                          229
TIME HRS.                 16                           17                           18
     MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
         .                                         *EX FINE S/S CFF RTC Y+P           *TAKE  1
         .                                         *EX COARSE S/S ON RTC Y+P           *REVERSE ATT
SPACECRAFT.                                          *STOP FILM PROCESSING                *PITCH CFF-SU
EVENTS   .*START ORBIT                                 *EX ROT ANT 1 DEG RT RTC 3 TIMES      *EX READOUT
         .                                 *STOP READCUT *EX READOUT PREP RTCS                  *EX 2ND
         .                                 *UPDATE ATT REF  *EX 2ND R/O DR ON RTC
         .                                      *PROC  3                        *STOP READOUT
         .                                         *EX PITCH PLUS X DEG RTC X=41.  *ATT CHG
TIME     MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
         .                                        *FINAL COMD CONF--MAP 42
MISSION  .                                                                                   *ACE-2 BRIEF RI
CONTROL  .
EVENTS   .
         .                                 *UPDATE ATTITUDE REFERENCE
         .                                     *S/C STATUS MSG TO RISING DSS
         .                                        *SEND SPC SEQ TO DSS
         .
TIME     MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
         .
FPAC     .
EVENTS   .
TIME     MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NCTES   *APOLUNE
.                                                                                    *FRAME 181
.                                                                                     SITE A-25
.
.
.
.
.
.
.
.
.
.
.
.
TIME     MIN.2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 8    .
EVENTS   .
---------.-----------------------------------------------------------------------------------------------
S/C 5    .
EVENTS   .
---------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME02300
```

389

```
MISSN PHASE ORBITAL        -- ORBIT  75  --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWW
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN CCC   .------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT   DAY.             229                            229                            229
TIME  HRS.              19                             20                             21
      MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .        *EX 2ND R/O DR ON RTC
          .         *STORE COMMANDS
SPACECRAFT.M                            *STOP READOUT
EVENTS    . PREP RTCS                    *PROC   4MM
          .R/C DR ON RTC                                 *EX READOUT PREP RTCS
          .*START ORBIT                                   *STOP FILM PROCESSING
          . *STOP READOUT                                   *EX 2ND R/O DR ON RTC
          .   *EX READOUT PREP RTCS
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
MISSION   .SING DSS
CONTROL   .*PREDICTED DSS 62 RISE
EVENTS    .       *TX PHOTO SPC--MAP 42
          .        *DSS HANDOVER PER ACE-2
          .                *PREDICTED DSS 41 SET
          .
          .
          .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
          .
FPAC      .
EVENTS    .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
.
. NOTES
.
.           *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 3     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233      TIMEC2300
```

391

```
  MISSN PHASE ORBITAL         -- ORBIT  76  --
  EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
  DSS VIEW 41
           62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
           12
  CAN OCC    .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCCCCC---------------------
  GMT   DAY.        229                        229                        230
  TIME  HRS.         22                         23                          0
        MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
             .                             *STOP READOUT               *PITCH OFF-SUN
             .                             *UPDATE ATT REF               *EX 2ND R/O DR ON RTC
  SPACECRAFT.                                      *PROC   3
  EVENTS     .                                             *STOP FILM PROCESSING
             .                                               *ATT CHG
             .                                                     *TAKE   4
             .                                                       *REVERSE ATT
             .*START ORBIT                                            *EX READOUT PREP RTCS
  TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
             .
  MISSION    .                             *UPDATE ATTITUDE REFERENCE
  CONTROL    .                                                       *S/C STATUS MSG TC RISING DSS
  EVENTS     .
             .
             .
             . *PRELIM COMD CONF--MAP 43
             .     --PHOTO--
  TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
             .
  FPAC       .
  EVENTS     .
  TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
  .
  .  NOTES     *APOLUNE
  .                                                       *FRAMES 182-185
  .                                                        SITE V-45.1
  .
  .
  .
  .
  .
  .
  .
  .
  .
  .
  .
  TIME  MIN.----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5-
  S/C 9      .
  EVENTS     .
  ----------.----------------------------------------------------------------------------------------------
  S/C 8      .
  EVENTS     .
  ----------.----------------------------------------------------------------------------------------------
  S/C 5      .
  EVENTS     .
  ----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
  RUN I.D.         DAY 233      TIME0230O
```

```
MISSN PHASE ORBITAL        -- ORBIT  77  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
         12                    GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC--------------------------
GMT    DAY. 230                     230                          230                          230
TIME   HRS.  1                       2                            3                            4
       MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                                               *TAKE   8
          .                                                *REVERSE ATT
          .                                                 *PITCH OFF-SUN
SPACECRAFT.*START ORBIT                                          *EX ROT ANT 1 DEG RT RTC 5 TIMES
EVENTS    .                       *STOP READOUT                    *EX READOUT PREP RTCS
          .                        *UPDATE ATT REF                   *EX 2ND R/O OR ON RTC
          .                          *PROC   3                          *STORE COMMANDS
          .                              *STOP FILM PROCESSING
          .                                  *ATT CHG
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .                                 *FINAL COMD CONF--MAP 43
MISSION   .                                 *DSS HANDOVER PER ACE-2
CONTROL   .                                                   *PREDICTED DSS 62 SET
EVENTS    .   *ACE-2 BRIEF RISING DSS                               *TX PHOTO SPC--MAP 43
          .         *PREDICTED DSS 12 RISE
          .              *UPDATE ATTITUDE REFERENCE
          .                   *SEND SPC SEC TO DSS
          .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
          .
FPAC      .
EVENTS    .
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
.
. NOTES                                             *FRAMES 186-193
.                                                    SITE V-46
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.---0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0-
S/C 9     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.--------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.       DAY 233     TIME02300
```

```
MISSN PHASE ORBITAL          -- ORBIT  78 --
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .-----------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCC-----------------------
GMT   DAY.                      230                          230                          230
TIME  HRS.                       5                            6                            7
      MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .                           *STOP READOUT
          .                            *PROC   4
SPACECRAFT.                                  *STOP FILM PROCESSING
EVENTS    .                                   *EX READOUT PREP RTCS
          .                                     *EX 2ND R/O DR ON RTC
          .
          .
          .*START ORBIT
TIME  MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .
MISSION   .
CONTROL   .
EVENTS    .
          .
          .
          .
          .
TIME  MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
          .
EPAC      .
EVENTS    .
TIME  MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
.
. NOTES
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.---1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I...          DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL        -- ORBIT  79  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41            W                                                              WWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .-------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCC------------------------
GMT   DAY.                     230                         230                         230
TIME  HRS.                       8                           9                          10
      MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .                                 *EX CHANGE SHUTTER SPEED    *EX READOUT PREP RTCS
          .                                   *PROC   3                    *EX 2ND R/O OR ON RTC
SPACECRAFT.                                          *STOP FILM PROCESSING
EVENTS    .                                           *ATT CHG
          .                                                 *TAKE   8
          .*START ORBIT                                       *REVERSE ATT
          .                             *STOP READOUT            *PITCH OFF-SUN
          .                             *UPDATE ATT REF              *EX ROT ANT 1 DEG RT RTC 5 TIMES
TIME  MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .           *PREDICTED DSS 41 RISE
MISSION   .                             *UPDATE ATTITUDE REFERENCE
CONTROL   .                                                 *ACE-2 BRIEF RISING DSS
EVENTS    .                                                                                   *DSS HAN
          .*PRELIM CCMD CONF--MAP 44
          .   --PHOTO--
          .       *S/C STATUS MSG TO RISING DSS
          .
TIME  MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
          .
FPAC      .
EVENTS    .
TIME  MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
.
. NOTES                                                     *FRAMES 194-201
.                                                            SITE V-48
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.--2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2--
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 6     .
EVENTS    .
----------.------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.        DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL       -- ORBIT  30  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62
         12GGGGGGGGGGGGGGG
CAN OCC   .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC----------------------
GMT   DAY.             230                             23C                             23C
TIME  HRS.             11                              12                              13
      MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
          .                                   *EX CHANGE SHUTTER SPEED                *STORE COMMANDS
          .                                              *ATT CHG
SPACECRAFT.*START ORBIT                                    *STOP FILM PROCESSING
EVENTS    .                             *STOP READOUT          *TAKE    4
          .                              *UPDATE ATT REF          *REVERSE ATT
          .                                   *PROC    6            *PITCH OFF-SUN
          .                                    *EX CHANGE SHUTTER SPEE*EX READOUT PREP RTCS
          .                                    *EX CHANGE SHUTTER SPEED  *EX 2ND R/O DR ON RTC
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
          .                                          *FINAL COMD CONF--MAP 44
MISSION   .                                                                          *TX PHOTO SPC--MAP 44
CONTROL   .
EVENTS    .COVER PER ACE-2
          .            *PREDICTED DSS 12 SET
          .                              *UPDATE ATTITUDE REFERENCE
          .                                        *SEND SPC SEQ TO DSS
          .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
          .
EPAC      .
EVENTS    .
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
.
. NOTES
.          *APOLUNE
.                                                             *FRAMES 202-205
.                                                              SITE V-49
.
.
.
.
.
.
.
.
.
.
TIME   MIN.--3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3---
S/C 9     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCXCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233     TIME023CC
```

```
  MISSN PHASE ORBITAL        -- ORBIT  81  --
  EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
  DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
           62
           12
  CAN OCC   .----------------------------------------------------000000000000000000000000000------------------------
  GMT   DAY.         230                        230                        230
  TIME  HRS.          14                         15                         16
        MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
            .                                                 *EX 2ND R/O DR ON RTC
            .*START ORBIT
  SPACECRAFT.                                *STOP READOUT
  EVENTS    .                                 *PROC   4
            .                                            *STOP FILM PROCESSING
            .                                             *EX ROT ANT 1 DEG RT RTC
            .                                             *EX READOUT PREP RTCS
            .                                              *EX ROT ANT 1 DEG RT RTC
  TIME  MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
            .
  MISSION   .
  CONTROL   .
  EVENTS    .
            .
            .
            .
            .
  TIME  MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
            .
  FPAC      .
  EVENTS    .
  TIME  MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
 .
 . NOTES    *APOLUNE
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
  TIME  MIN.-4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4---
  S/C 9     .
  EVENTS    .
  ----------.----------------------------------------------------------------------------------------------
  S/C 8     .
  EVENTS    .
  ----------.----------------------------------------------------------------------------------------------
  S/C 5     .
  EVENTS    .
  ----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
  RUN I.D.          DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL          -- ORBIT  82 --
EARTH CCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW
         62                                                                              MMMMMMMMMMMMMMMMMMMMMMMMMM
         12
CAN OCC   .-----------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT    DAY.   230                          230                        230                              23
TIME   HRS.    17                           18                         19                               2
       MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .                                                         *PROC    5.3
          .*START ORBIT                                                         *STOP FILM PROCESSING
SPACECRAFT.                         *STOP READOUT                                     *EX READOUT PREP R
EVENTS    .                          *UPDATE ATT REF                                     *EX 2ND R/O DR
          .                                      *ATT CHG
          .                                            *TAKE   4
          .                                              *REVERSE ATT
          .                                                 *PITCH OFF-SUN
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .                                                                                          *P
MISSION   .
CONTROL   .         *S/C STATUS MSG TO RISING DSS
EVENTS    .                          *UPDATE ATTITUDE REFERENCE
          .                                                *ACE-2 BRIEF RISING DSS
          .                                                              *PREDICTED DSS 62 RISE
          .                                                               # <---------*DSS HANDOVER
          .
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
          .
FPAC      .
EVENTS    .
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
.
. NOTES
.         *APOLUNE
.                                                  *FRAMES 206-209
.                                                   SITE V-50
.
.
.
.
.
.
.
.
.
.
.
TIME   MIN.-5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----
S/C 9     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.---------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.         DAY 233      TIME02300
```

```
 MISSN PHASE ORBITAL        -- ORBIT  83  --
 EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
 DSS VIEW 41
            62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
            12
 CAN OCC   .--------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC-----------------------
 GMT    DAY.C                    230                           230                           230
 TIME   HRS.C                    21                            22                            23
        MIN.C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
           .                                                *TAKE   8                            *EX 2ND R/
           .                                                  *REVERSE ATT
 SPACECRAFT.TCS                                                 *PITCH OFF-SUN
 EVENTS    .CN RTC                                                *STORE COMMANDS
           .*START ORBIT                                          *PROC  10
           .                     *STOP READOUT                                                  *EX ROT ANT 1
           .                     *UPDATE ATT REF                                                *EX READOUT P
           .                                      *ATT CHG                                      *STOP FILM PR
 TIME   MIN.C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
           .REDICTED DSS 41 SET
 MISSION   .                    *SEND SPC SEQ TO DSS
 CONTROL   .                     *UPDATE ATTITUDE REFERENCE
 EVENTS    .                      *FINAL COMD CONF PUD--MAP 45
           .                                                  *TX PROGRAMMER UPDATE SPC--MAP 45
           .
           .PER ACE-2
           .
 TIME   MIN.C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----

 FPAC      .
 EVENTS    .
 TIME   MIN.C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
 .
 . NOTES    *APOLUNE
 .                                                 *FRAMES 210-217
 .                                                  SITE V-51
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
 .
 TIME   MIN.C----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----
 S/C 9     .
 EVENTS    .
 ----------.----------------------------------------------------------------------------------------------
 S/C 8     .
 EVENTS    .
 ----------.----------------------------------------------------------------------------------------------
 S/C 5     .
 EVENTS    .
 ----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
 RUN I.D.          DAY 233      TIME02300
```

```
MISSN PHASE ORBITAL        -- ORBIT  84  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
          62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
          12                                                                                                    G GGGG
CAN OCC   .-----------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCC---------------------
GMT   DAY.                        231                        231                        231
TIME  HRS.                          0                          1                          2
      MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .C DR ON RTC                                       *EX 2ND R/C DR ON RTC
          .*START ORBIT
SPACECRAFT.
EVENTS    .                                 *STOP READOUT
          .                                   *TAKE  16
          . DEG RT RTC 3 TIMES                 *PROC   6
          .REP RTCS                                        *EX READOUT PREP RTCS
          .CCESSING                                         *STOP FILM PROCESSING
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .                                                                                          *PREDI
MISSION   .
CONTROL   .
EVENTS    .
          .
          .                                *S/C STATUS MSG TO RISING DSS
          .                                                                                  *ACE-2 BRIEF RISING
          .
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
          .
EPAC      .
EVENTS    .
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
.
. NOTES                               *FRAME
.                                      FILM ADVANCE
.          *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233     TIME02300
```

```
MISSN PHASE ORBITAL       -- ORBIT  85  --
EARTH OCC  .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41
            62MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM   M
            12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC    .--------------------------------------------------000000000000000000000000-----------------------
GMT     DAY.                231                           231                           231
TIME    HRS.                 3                              4                             5
        MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
           .                                                *TAKE 1  *EX PITCH PLUS X DEG RTC
           .                                                 *TAKE 1     *EX READOUT PREP RTCS
SPACECRAFT.                                                   *TAKE 1       *EX 2ND R/O OR ON RTC
EVENTS     .*START ORBIT                                       *TAKE 1
           .      *STOP READOUT                                 *TAKE 1
           .                              *EXECUTE CUT BIMAT  *TAKE 1  *EXECUTE CUT BIMAT
           .             *PROC    6                       SPC  *TAKE 1
           .                             *STOP FILM PROCESSING*TAKE 1
TIME    MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
           .
MISSION    .
CONTROL    .
EVENTS     . DSS
           .CTED DSS 12 RISE
           .                    *DSS HANDOVER PER ACE-2
           .                                                *PREDICTED DSS 62 SET
           .
TIME    MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
           .
FPAC       .
EVENTS     .
TIME    MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
.
. NOTES     *APOLUNE                03:17:37                              THIS IS THE START OF
.                                  BIMAT EXHAUSTED                        FINAL READOUT OFF ALL
.                                  AT THIS TIME                           FRAMES EXPOSED.
.
.
.
.
.
.
.
.
.
.
.
TIME    MIN.----3----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3
S/C 9      .
EVENTS     .
-----------.----------------------------------------------------------------------------------------------------
S/C 8      .
EVENTS     .
-----------.----------------------------------------------------------------------------------------------------
S/C 5      .
EVENTS     .
-----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 235      TIME01443
```

```
MISSN PHASE ORBITAL        -- ORBIT  86  --
EARTH OCC .EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
DSS VIEW 41                                                                                                        W
          62
          12GGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG
CAN OCC   .----------------------------------------------------------------------CCCCCCCCCCCCCCCCCCCCCCCCCCC----------------------
GMT   DAY.          231                         231                         231
TIME  HRS.           6                           7                           8
      MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
          .
SPACECRAFT.
EVENTS    .*START ORBIT
          .   *STOP READOUT
          .         *STOP READOUT
          .                                         *EX READOUT PREP RTCS
          .                                            *EX 2ND R/O DR ON RTC
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
MISSION   .
CONTROL   .
EVENTS    .                                                                        *S/C STATUS MSG TO RIS
          .                                                                                     *PREDICT
          .
          .
          .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
          .
FPAC      .
EVENTS    .
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
.
. NOTES
.         *APOLUNE
.
.
.
.
.
.
.
.
.
.
.
.
.
TIME  MIN.----4----5----0----1----2----3----4----5----0----1----2----3----4----5----0----1----2----3----4-
S/C 9     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 8     .
EVENTS    .
----------.-----------------------------------------------------------------------------------------------
S/C 5     .
EVENTS    .
----------.CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
RUN I.D.          DAY 233      TIME02300
```