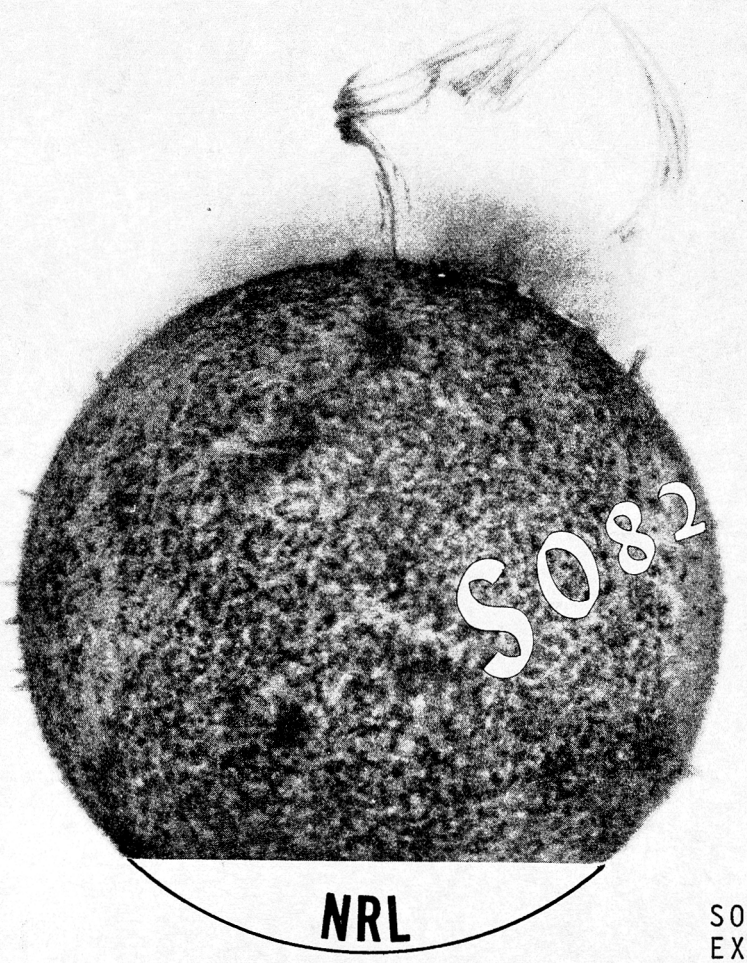
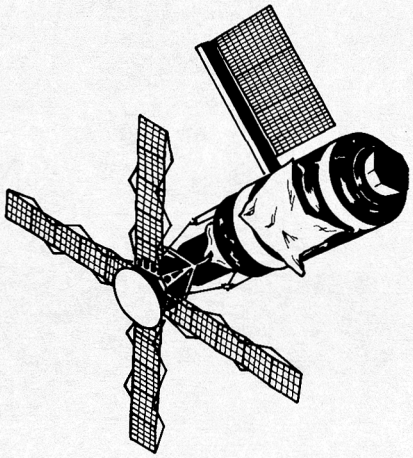
"A" Data Room

NRL / ATM
MISSION ENGINEERING DATA





S082A SPECTROHELIOGRAPH
EXPOSURES 3A-001 THROUGH 3A-201

BALL BROTHERS RESEARCH CORPORATION
SUBSIDIARY OF BALL CORPORATION
BOULDER, COLORADO

A HUGE ERUPTION FROM THE SURFACE OF THE SUN SEEN IN THE LIGHT OF HE II AT 304Å
9 AUGUST 1973

This photograph, obtained during the Skylab 3 Mission, reveals for the first time that helium erupting from the sun can stay together to altitudes up to 500,000 miles. After being ejected from the sun, the gas clouds seem to have come to a standstill, as though blocked by an unseen wall, and some material appears to have been directed back toward the sun as rain, distinguished by fine threads. At present it is a challenge to explain this mystery — what forces expelled these huge clouds, then blocked its further progress, yet allowed the cloud to maintain its threads. Both magnetic fields and gravity must play a part, but these curious forms seem to defy explanation based on magnetic and gravitational fields alone.

The instrument which produced this image was an extreme ultraviolet spectroheliograph, designed and constructed by the Naval Research Laboratory and the Ball Brothers Research Corporation under the direction of Dr. R. Tousey, the Principal Investigator for this NASA experiment. To the left may be seen the sun's image in emission from iron atoms which have lost 14 electrons by collision in the suns' million-degree coronal plasma gas.

Camera No A 4

Sequence Log

ATM No.	Film Roll strip cut	Dev Run
3A001	6A-5	2
3A002	1A-80	
3A003	1A-79	
3A004	1A-78	
3A005	1A-77	
3A006	1A-76	
3A007	1A-75	
3A008	1A-74	
3A009	1A-73	
3A010	1A-72	
3A011	1A-71	
3A012	1A-69	
3A013	1A-68	
3A014	1A-67	
3A015	1A-66	
3A016	1A-65	
3A017	1A-64	
3A018	1A-63	
3A019	1A-62	
3A020	1A-61	
3A021	1A-60	
3A022	1A-58	
3A023	1A-57	
3A024	1A-56	
3A025	1A-55	
3A026	1A-54	
3A027	1A-53	
3A028	1A-52	
3A029	1A-51	
3A030	1A-50	2
3A031	1A-49	1
3A032	1A-47	
3A033	1A-46	
3A034	1A-45	
3A035	1A-44	
3A036	1A-43	
3A037	1A-42	
3A038	1A-41	
3A039	1A-40	
3A040	1A-39	
3A041	1A-38	
3A042	1A-36	
3A043	1A-35	
3A044	1A-34	
3A045	1A-33	
3A046	1A-32	
3A047	1A-31	
3A048	1A-30	
3A049	1A-29	
3A050	1A-28	

ATM No.	Film Roll strip cut	Dev Run
3A051	1A-27	
3A052	1A-25	
3A053	1A-24	
3A054	1A-23	
3A055	1A-22	
3A056	1A-21	
3A057	1A-20	
3A058	1A-19	
3A059	1A-18	
3A060	1A-17	
3A061	1A-16	
3A062	1A-14	
3A063	1A-13	
3A064	1A-12	
3A065	1A-11	
3A066	1A-10	
3A067	1A-9	
3A068	1A-8	
3A069	1A-7	
3A070	1A-6	1
3A071	6A-38	3
3A072	6A-39	
3A073	6A-40	
3A074	6A-41	
3A075	6A-42	
3A076	6A-43	
3A077	6A-44	
3A078	6A-45	
3A079	6A-46	
3A080	6A-48	
3A081	6A-49	
3A082	6A-50	
3A083	6A-51	
3A084	6A-52	
3A085	6A-53	
3A086	6A-54	
3A087	6A-55	
3A088	6A-56	
3A089	6A-57	
3A090	6A-59	3
3A091	6A-60	4
3A092	6A-61	
3A093	6A-62	
3A094	6A-63	
3A095	6A-64	
3A096	6A-67	
3A097	6A-68	
3A098	6A-70	
3A099	6A-71	
3A100	6A-72	4

ATM No.	Film Roll strip cut	Dev Run
3A101	6A-73	2
3A102	6A-74	
3A103	6A-75	
3A104	6A-76	
3A105	6A-77	
3A106	6A-78	
3A107	6A-79	
3A108	6B-5	
3A109	6B-6	
3A110	6B-7	2
3A111	6B-8	3
3A112	6B-9	
3A113	6B-10	
3A114	6B-11	
3A115	6B-12	
3A116	6B-13	
3A117	6B-15	
3A118	6B-16	
3A119	6B-17	
3A120	6B-18	
3A121	6B-19	
3A122	6B-20	
3A123	6B-21	
3A124	6B-22	
3A125	6B-23	
3A126	6B-24	
3A127	6B-25	
3A128	6B-27	
3A129	6B-28	
3A130	6B-29	
3A131	6B-30	3
3A132	6B-31	5
3A133	6B-32	
3A134	6B-33	
3A135	6B-34	
3A136	6B-35	
3A137	6B-36	
3A138	6B-38	
3A139	6B-39	
3A140	6B-40	
3A141	6B-41	
3A142	6B-42	
3A143	6B-43	
3A144	6B-44	
3A145	6B-45	
3A146	6B-46	
3A147	6B-47	
3A148	6B-49	
3A149	6B-50	
3A150	6B-51	

ATM No	Film Roll strip cut	Dev Run
3A151	6B-52	
3A152	6B-53	
3A153	6B-54	
3A154	6B-55	
3A155	6B-56	
3A156	6B-57	
3A157	6B-58	
3A158	6B-60	
3A159	6B-61	
3A160	6B-62	
3A161	6B-63	
3A162	6B-64	
3A163	6B-65	
3A164	6B-66	
3A165	6B-67	
3A166	6B-68	
3A167	6B-69	
3A168	6B-71	
3A169	6A-84	
3A170	6A-85	
3A171	6A-86	
3A172	6A-87	5
3A173	6A-88	4
3A174	6A-33	
3A175	6A-32	
3A176	6A-31	
3A177	6A-30	
3A178	6A-29	
3A179	6A-28	
3A180	6A-27	
3A181 (101)	6A-26	
3A182	6A-25	
3A183	6A-24	
3A184	6A-23	
3A185	6A-22	
3A186	6A-21	
3A187	6A-20	
3A188	6A-19	
3A189	6A-18	
3A190	6A-17	
3A191	6A-16	
3A192	6A-14	
3A193	6A-13	
3A194	9-5	
3A195	9-6	
3A196	9-7	
3A197	9-8	
3A198	6A-10	
3A199	6A-9	
3A200	6A-8	
3A201	6A-7	
3A202	6A-6	4

Film Data.	
Roll No.	Film Type
1A	104-06-04
6A	104-06-04
6B	104-06-04
9	104-06-08
3	101-06-05

BALL BROTHERS RESEARCH CORPORATION

BOULDER, COLORADO

NRL/ATM
MISSION ENGINEERING DATA
FOR
S082A SPECTROHELIOGRAPH
EXPOSURES 3A-001 THROUGH 3A-201

620-243 — 22 May 1974
Rev. A — 13 May 1975

Contract No. N00014-67-C-0470
Exhibit C-1 Phase III CDRL
Sequence No. 16

PREPARED

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Configuration Management

APPROVED

M. W. Frank
NRL/ATM Program Manager

FORM BR-72

FOREWORD

The purpose of this document is to provide the camera photographic log, the JSC science console data, and the MSFC engineering data for S082A Film Camera, S/N CM10A-006 HRE (exposure numbers 3A-001 through 3A-201). The requirements for the Mission Engineering Data (MED) and the Camera Photographic Log (CPL) are combined in this document. This document was prepared by Ball Brothers Research Corporation, Boulder, Colorado, under Contract N00014-67-C-0470 with the Naval Research Laboratory, Washington, DC. The authority for the MED is BBRC Proposal C-474 which was added by Contract Modification P00055. The authority for the CPL is BBRC NRL/ATM Engineering Change Proposal PPD-054 Rev 1 which was added by Contract Modification P00064.

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INTRODUCTION

1.0 INTRODUCTION

This document contains a history of each flight film frame from its receipt by BBRC from NRL through the time of its development. This includes camera identification and mission use, ground and orbit environment, loading and unloading data, filter data if applicable and the camera life history. Also included are engineering and scientific parameters related to each frame during exposure on the Skylab Mission. This exposure data is provided in the form of Engineering Data Books (EDB's) obtained from MSFC and JSC and edited by BBRC, and a Diode Array Data Log provided by NRL.

The Camera Flight Load Number, Camera Serial Number and the Exposure Numbers relative to each Skylab Mission are given in the following tables (Tables 1 and 2). Noted are the BBRC 620 Documents that should be consulted for the respective exposures. Each document is confined to a block of exposures obtained by a specific camera during the various Skylab Missions.

Table 1-1

S082A Camera Related Data

Skylab Mission	Flight Load No.	Camera Serial No.	Exposure Numbers	Referenced 620 Documents
SL-1 & 2	A-1 A-2	CM10A-003 CM10A-007	1A-001→1A-019 1A-201→1A-402	620-239 620-240
SL-3	A-2* A-3	CM10A-005 CM10A-006	2A-001→2A-201 2A-301→2A-501	620-241 620-242
SL-4	A-4 A-5	CM10A-006 HRE CM10A-005 HRE	3A-001→3A-201 3A-301→3A-500	620-243 620-244

*Replacement load for original A-2 load used during SL-1 & 2 instead of during SL-3 due to a malfunction of A003 camera.

HRE designates reflight (i.e., flown on a previous mission).

Table 1-2

S082B Camera Related Data

Skylab Mission	Flight Load No.	Camera Serial No.	Exposure Numbers	Referenced 620 Documents
SL-1 & 2	B-1	CM11A-003	1B-001-1→1B-201-8	620-245
SL-3	B-2 B-3	CM11A-005 CM11A-004	2B-001-1→2B-201-4 2B-301-1→2B-500-1	620-246 620-247
SL-4	B-4	CM11A-003 HRE	3B-001-1→3B-201-8	260-248

HRE designates reflight (i.e., flown on a previous mission).

Thermal Distortion data for the instruments relative to each Skylab Mission may be obtained from BBRC Document No. 620-238, entitled NRL/ATM Thermal Distortion Performance for S082A and S082B Instruments. Distortion data relative to a particular exposure may be time correlated to the information in the noted document. The document is published in five (5) volumes.

Volume I	Thermal Distortion Program Description
Volume II	S082A Thermal Distortion Plots SL-3 & SL-4
Volume III	S082B Thermal Distortion Plots SL-3
Volume IV	S082B Thermal Distortion Plots SL-4 DOY 332 through DOY 362
Volume V	S082B Thermal Distortion Plots SL-4 DOY 363 through DOY 383 (18 of 1974)

Additional sorting of the JSC EDB data by Joint Observing Program (JOP), target, etc. has been accomplished and is published in BBRC Document No. 620-249, entitled NRL/ATM S082 Exposure Catalog.

CAMERA AND FILM HISTORY

2.0 CAMERA AND FILM HISTORY

This section contains a compilation of data that traces the history of each exposed flight film frame beginning with camera identification and mission application. The period covered is from cold storage at BBRC, just prior to the film cutting for installation in the camera, to the time of its development at NRL. Film temperature and radiation environmental data is provided. Included are loading and unloading data providing traceability of each exposure number to a specific film roll and type, and to each control sample, film holder and exposure sequence. Pre-flight and post-flight aluminum filter data for the S082A cameras are included. Also included is an extraction, from BBRC Document No. 620-132, entitled Film Camera History, for each respective camera.

2.1 CAMERA IDENTIFICATION AND MISSION USE

Camera:	P/N 36360-501; S/N CM10A-006 HRE
Flight:	L/N A-4
No. of Film Holders:	Upper 100; Lower 101; Carrier 1
Skylab Mission:	SL-4
Launch Date:	16 November 1973
Installed on Instrument:	22 November 1973
Removed from Instrument:	25 December 1973
Splashdown:	8 February 1974

Significant Remarks:

A camera was modified to utilize "B" camera aluminum type flat film holders, P/N 39698-1, Reference NMR 27846 and NASA ASHUR Request No. 117024. This modification was due to marks on film noted after Skylab SL-3. Launched in Command Module on SL-4, exposed on SL-4, and returned on SL-4.

2.2 ENVIRONMENTAL DATA

The Environmental Data Section includes a graph of temperature vs day-of-year from loading to unloading of the cameras, and cumulative radiation vs day-of-year for the mission period. These graphs provide a quick look at the environmental parameters to which the film was subjected (See Fig. 2-1). The source for the in-flight data is from the environmental log book maintained at the NRL Science Console.

2.3 LOADING DATA

The film camera was loaded at BBRC just prior to shipment to KSC. Film strips were cut from a roll of bulk film which was 70mm wide and approximately 120 feet long. The film strips were cut to 35 x 248mm. These strips were placed into film holders, loaded into the camera, vacuum dried, and cooled to 40°F. The attached chart (See Table 2-1) shows the relationship between each strip of film as it was cut from the bulk roll of film to control sample number or exposure number and the holder number in the order in which it was loaded. The two columns entitled "Roll #" lists the film roll number and strip number as it was cut from the roll. The column entitled "Control Sample #" numerically lists each control sample. The column entitled "Exposure #" is the number assigned by NRL to each individual exposure. The column entitled "Film Holder #" shows the film holder number at the time of loading. This chart provides a cross reference for roll, strip, exposure and holder. It also provides a cross reference between roll and strip number to control sample.

There were four (4) control samples taken at the beginning of each roll, one taken at intervals of approximately ten (10) film

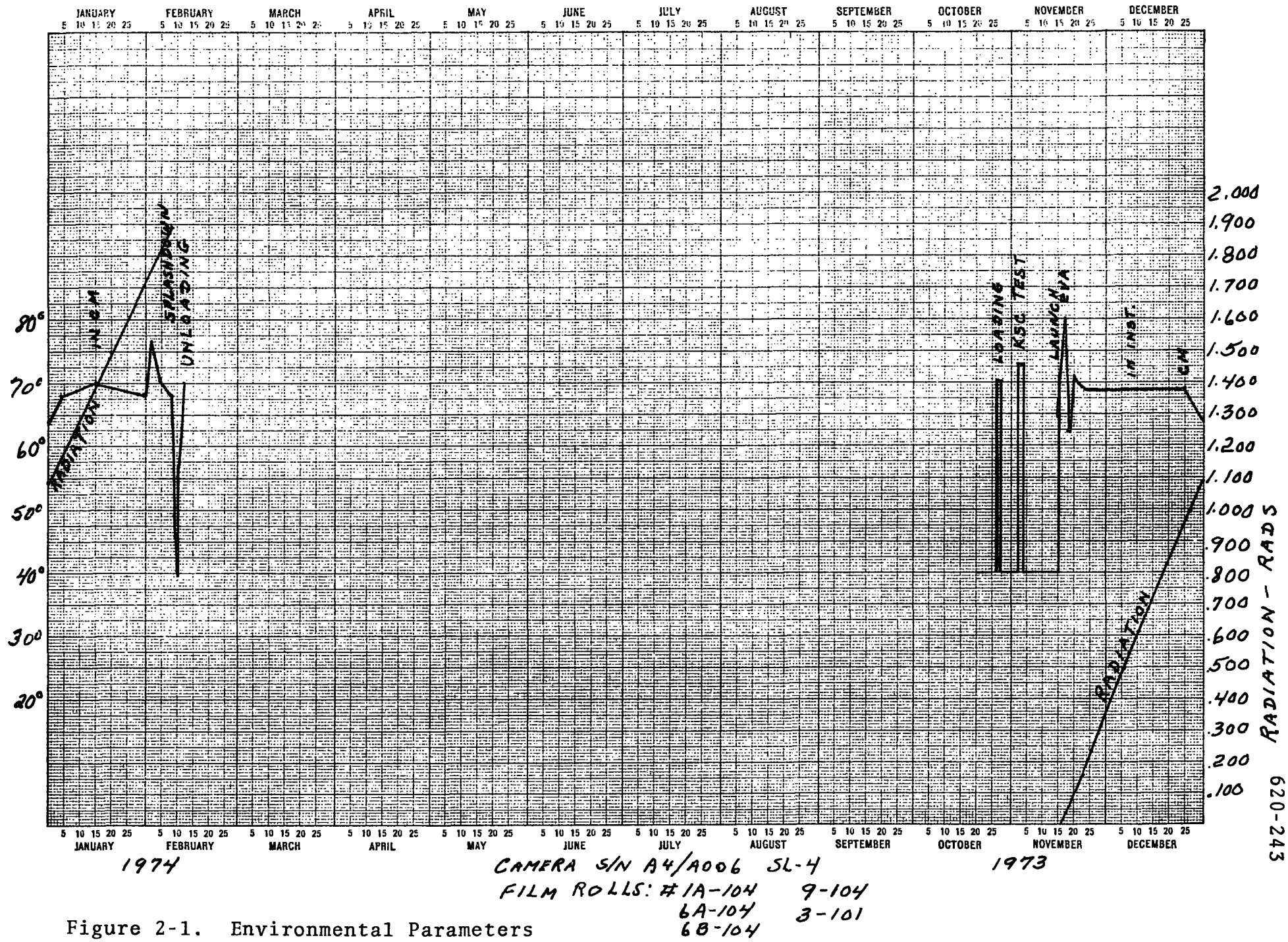


Figure 2-1. Environmental Parameters

Table 2-1

FILM TRACEABILITY CHART

DATE 4/1/74 CAMERA P/N 36360-501 S/N A4/A006 HRE

ROLL NO.	CONTROL SAMPLE NO	EXPOSURE NO.	FILM HOLDER NO.
1A-1	1		
1A-2	2		
1A-3	3		
1A-4	4		
6A-38		3A071	1
1A-6		3A070	2
1A-7		3A069	3
1A-8		3A068	4
1A-9		3A067	5
1A-10		3A066	6
1A-11		3A065	7
1A-12		3A064	8
1A-13		3A063	9
1A-14		3A062	10
1A-15	5		
1A-16		3A061	11
1A-17		3A060	12
1A-18		3A059	13
1A-19		3A058	14
1A-20		3A057	15
1A-21		3A056	16
1A-22		3A055	17
1A-23		3A054	18
1A-24		3A053	19
1A-25		3A052	20
1A-26	6		
1A-27		3A051	21
1A-28		3A050	22
1A-29		3A049	23
1A-30		3A048	24
1A-31		3A047	25
1A-32		3A046	26
1A-33		3A045	27
1A-34		3A044	28
1A-35		3A043	29
1A-36		3A042	30
1A-37	7		
1A-38		3A041	31
1A-39		3A040	32
1A-40		3A039	33
1A-41		3A038	34
1A-42		3A037	35
1A-43		3A036	36
1A-44		3A035	37
1A-45		3A034	38
1A-46		3A033	37
1A-47		3A032	38
1A-48	8		
1A-49		3A031	41
1A-50		3A030	42
1A-51		3A029	43
1A-52		3A028	44
1A-53		3A027	45
1A-54		3A026	46
1A-55		3A025	47
1A-56		3A024	48
1A-57		3A023	49
1A-58		3A022	50
1A-59	9		
1A-60		3A021	51
1A-61		3A020	52
1A-62		3A019	53
1A-63		3A018	54
1A-64		3A017	55
1A-65		3A016	56
1A-66		3A015	57
1A-67		3A014	58
1A-68		3A013	59
1A-69		3A012	60
1A-70	10		
1A-71		3A011	61
1A-72		3A010	62
1A-73		3A009	63
1A-74		3A008	64
1A-75		3A007	65
1A-76		3A006	66
1A-77		3A005	67
1A-78		3A004	68
1A-79		3A003	69
1A-80		3A002	70
1A-81	11		
1A-82	12		
6A-1	13		
6A-2	14		
6A-3	15		
6A-4	16		
6A-5		3A001	71
6A-6		3A202	72
6A-7		3A201	73
6A-8		3A200	74
6A-9		3A199	75
6A-10		3A198	76
9-1			
9-2			
9-3			
9-4			
9-8		3A197	77
9-7		3A196	78
9-6		3A195	79
9-5		3A194	80
6A-13		3A193	81
6A-14		3A192	82
6A-15	17		
6A-16		3A191	83
6A-17		3A190	84
6A-18		3A189	85
6A-19		3A188	86
6A-20		3A187	87
6A-21		3A186	88
6A-22		3A185	89
6A-23		3A184	90
6A-24		3A183	91
6A-25	18		
6A-26		3A182	92
3-1		3A181	93
3-2	19		
3-3	20		
6A-27		3A180	94
6A-28		3A179	95
6A-29		3A178	96
6A-30		3A177	97
6A-31		3A176	98
6A-32		3A175	99
6A-33		3A174	100
6A-36	21		

ROLL NO.	CONTROL SAMPLE NO.	EXPOSURE NO.	FILM HOLDER NO.
6A-39		3A072	101
6A-40		3A073	102
6A-41		3A074	103
6A-42		3A075	104
6A-43		3A076	105
6A-44		3A077	106
6A-45		3A078	107
6A-46		3A079	108
6A-47	22		
6A-48		3A080	109
6A-49		3A081	110
6A-50		3A082	111
6A-51		3A083	112
6A-52		3A084	113
6A-53		3A085	114
6A-54		3A086	115
6A-55		3A087	116
6A-56		3A088	117
6A-57		3A089	118
6A-58	23		
6A-59		3A090	119
6A-60		3A091	120
6A-61		3A092	121
6A-62		3A093	122
6A-63		3A094	123
6A-64		3A095	124
6A-67		3A096	125
6A-68		3A097	126
6A-69	24		
6A-70		3A098	127
6A-71		3A099	128
6A-72		3A100	129
6A-73		3A101	130
6A-74		3A102	131
6A-75		3A103	132
6A-76		3A104	133
6A-77		3A105	134
6A-78		3A106	135
6A-79		3A107	136
6A-80	25		
6A-81	26		
6B-1	27		
6B-2	28		
6B-3	29		
6B-4	30		
6B-5		3A108	137
6B-6		3A109	138
6B-7		3A110	139
6B-8		3A111	140
6B-9		3A112	141
6B-10		3A113	142
6B-11		3A114	143
6B-12		3A115	144
6B-13		3A116	145
6B-14	31		
6B-15		3A117	146
6B-16		3A118	147
6B-17		3A119	148
6B-18		3A120	149
6B-19		3A121	150
6B-20		3A122	151
6B-21		3A123	152
6B-22		3A124	153
6B-23		3A125	154
6B-24		3A126	155
6B-25		3A127	156
6B-26	32		
6B-27		3A128	157
6B-28		3A129	158
6B-29		3A130	159
6B-30		3A131	160
6B-31		3A132	161
6B-32		3A133	162
6B-33		3A134	163
6B-34		3A135	164
6B-35		3A136	165
6B-36		3A137	166
6B-37	33		
6B-38		3A138	167
6B-39		3A139	168
6B-40		3A140	169
6B-41		3A141	170
6B-42		3A142	171
6B-43		3A143	172
6B-44		3A144	173
6B-45		3A145	174
6B-46		3A146	175
6B-47		3A147	176
6B-48	34		
6B-49		3A148	177
6B-50		3A149	178
6B-51		3A150	179
6B-52		3A151	180
6B-53		3A152	181
6B-54		3A153	182
6B-55		3A154	183
6B-56		3A155	184
6B-57		3A156	185
6B-58		3A157	186
6B-59	35		
6B-60		3A158	187
6B-61		3A159	188
6B-62		3A160	189
6B-63		3A161	190
6B-64		3A162	191
6B-65		3A163	192
6B-66		3A164	193
6B-67		3A165	194
6B-68		3A166	195
6B-69		3A167	196
6B-70	36		
6B-71		3A168	197
6B-73	37		
6A-74	38		
6A-82	17		
6A-83	27		
6A-84		3A169	198
6A-85		3A170	199
6A-86		3A171	200
6A-87		3A172	201
6A-88		3A173	202
6A-89	3		
6A-90	4		
6A-91	5		
6A-92	6		
6A-93	77		

NOTE:

Exposure 3A-202 was not exposed to sunlight.

FILM DATA	
ROLL NO.	FILM TYPE
1A	104-06-04
6A	104-06-04
6B	104-06-04
9	104-06-08
3	101-06-05

holders and two (2) taken at the end of the roll. Therefore, two (2) control samples could be used to bracket each ten (10) film holders in the event of any film degradation.

The block entitled "Film Data" at the bottom of Table 2-1 lists each roll of bulk film by number and type of film.

2.4 UNLOADING DATA

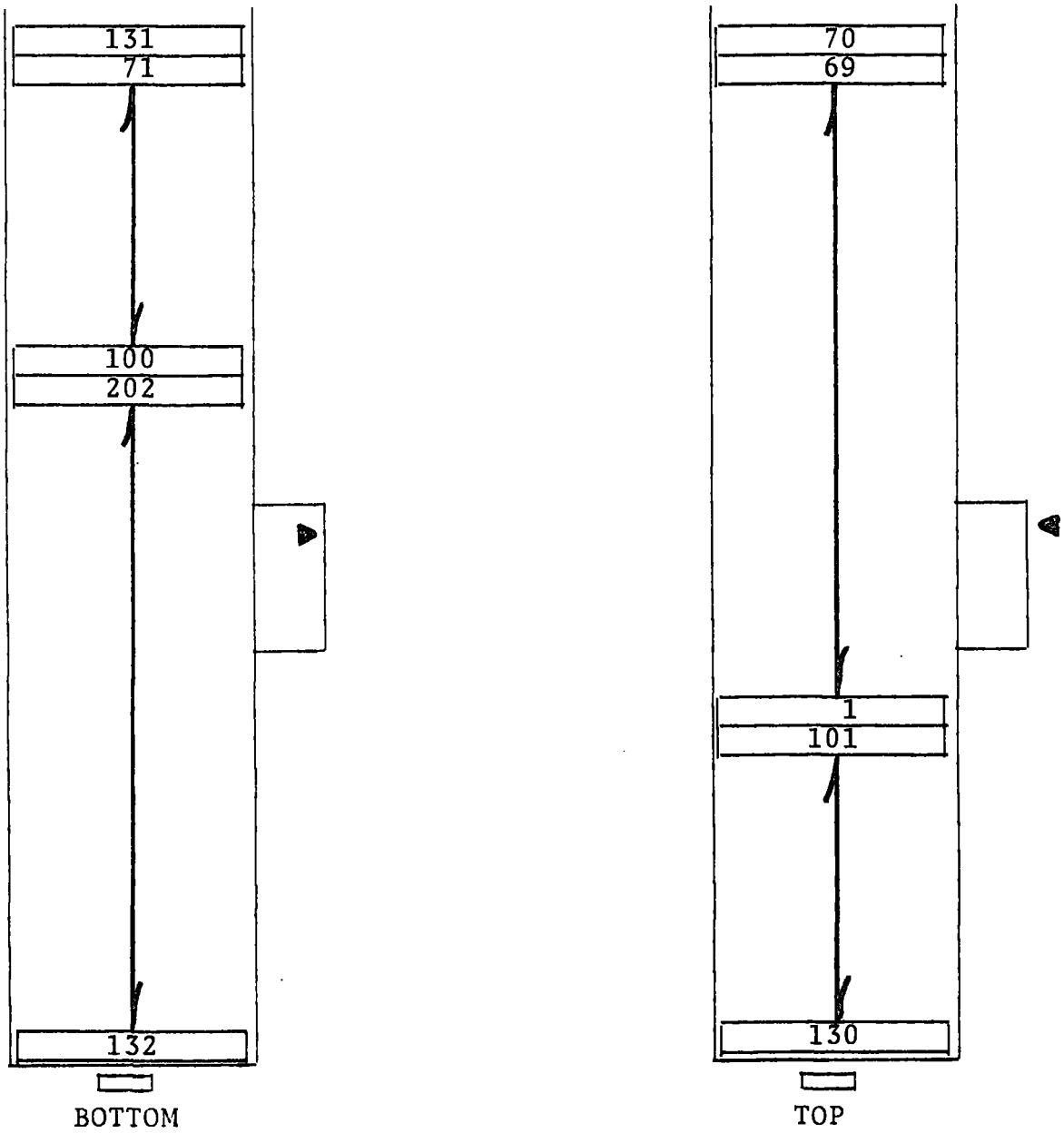
The cameras were flown to NRL after splashdown for unloading. The attached chart (see Table 2-2) shows the order in which the film holders were placed into the cassettes during the unloading operation. The film holder numbers can be traced to the loading data chart, Table 2-1, to cross reference exposure, roll and strip numbers.

The table (see Table 2-3) entitled "Developing" lists the exposure numbers and development control samples in the order in which they were developed. The development control samples are strips of film cut from the same type of film, although a different roll, to check the developing solutions, process, etc. For exposure information concerning these samples refer to the NRL McPherson Log. These samples do not relate to the control samples taken during loading. Regular development runs are numbered 1, 2, 3, etc., runs numbered A, B, etc. are preselected holders removed during unloading the camera to be developed prior to developing the complete camera load. These holders were not loaded into cassettes but were used to verify film position.

2.5 ALUMINUM FILTER DATA

An aluminum filter was located just behind the camera aperture and consisted of a thin sheet (1000Å thick) of aluminum on a wire mesh substrate. This filter screened out all light wavelengths

Table 2-2
Unloading Traceability Chart



Camera A4/A006 HRE
Date 11 Feb 1974

Table 2-3
Developing

Camera Serial No. CM10A-006 HRE

Flight Load No. A-4

Run No.	Exposure Numbers	Dev. Control Sample	Date
1	3A031 through 3A070		2/22/74
2	3A001 through 3A030		2/22/74
	3A101 through 3A110		2/22/74
3	3A111 through 3A130,		2/22/74
	3A131		2/22/74
	3A071 through 3A090		2/22/74
4	3A091 through 3A100		2/22/74
	3A202 through 3A173		2/22/74
5	3A172 through 3A132		2/22/74

except the desired wavelength band between 150 and 650Å. This filter data includes manufacturing, test and evaluation data relating to the aluminum filter installed in the camera prior to film loading. These data were compiled by the filter manufacturer, Sigmatron Inc., and the Naval Research Laboratory, and is included for reference. The contents of these data are as follows:

- Photograph of Filter (see Fig. 2-2)
- Pinhole Fogging Map (see Fig. 2-3)
- Pinhole Plugging Map (see Fig. 2-4)
- Manufacturing and Environmental Test Data (see Data Sheets, Pages 2-12 through 2-17). Rev A
- Preflight Transmission Data (see Data Sheet, page ____). (This information not supplied) Rev A
- Post Flight Transmission Data (see Fig. 2-5). (This information not supplied)

The post flight measurements were performed at NRL by Code 7143. The printouts of the reduced data (see Table 2-4) are described below:

Key to table of measured transmittances of the ATM-2 Al filters:

Column 1 Wavelength (Å)

Column 2 Although labelled "ANG. INC." these numbers identify the filters and the position on that filter at which the measurement was made. A key to these numbers is given at the top of each first page.

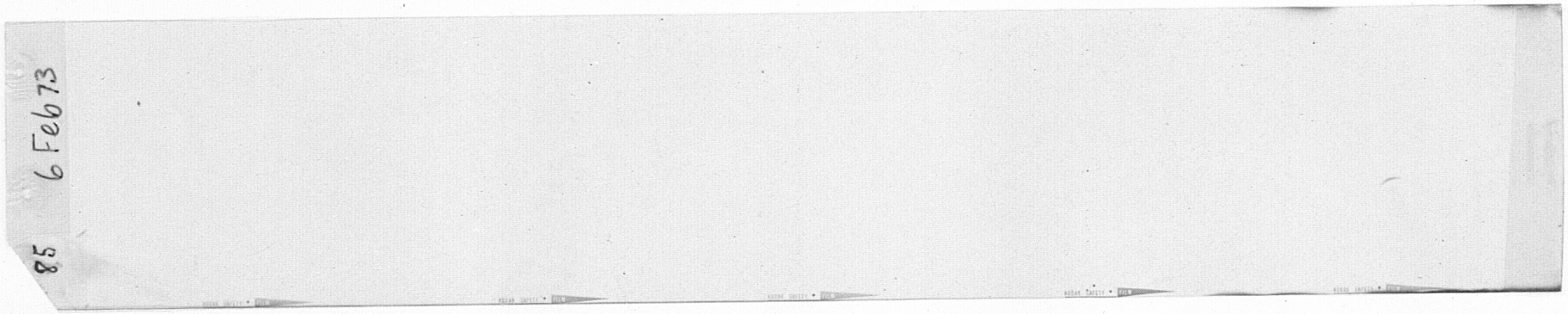
Column 3 Measured Transmittance.

Column 4 Probable Error of the Measurement.

Column 5 Probable error converted to % error.

Rev A

Figure 2-2 Photograph of Filter



PINHOLE FOGGING MAP DATE: 6 Feb 73

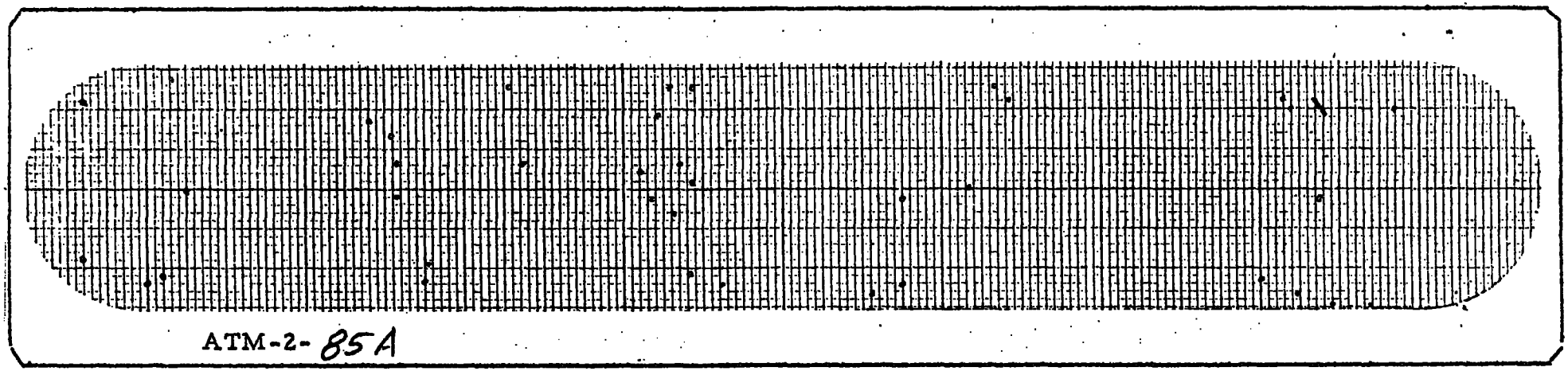
ATM-2- 85

Figure 2-3 Pinhole Fogging Map

PINHOLE PLUGGING MAP

Filter I.D. No.: ATM-2-85A Operator: G. Steele Date: 28 Jan 73

Plug Material: 3022:18/210:180 Lot No.: B2-007 Exp. Date: 6-6-74



Comments: Ind grade - No parlodion effect - suitable flight quality on pinhole basis at this point.

ATM FILTER DATA SHEET

FRAME NUMBER ATM-2-850

Frame Data:

Date Received 8-16-72 By LLS

Certification —

Cleaning:

Date 1-15-73 Operator RLS

Wash:

Frame cleaning procedure Lot

Aug 72 Lot

Lot

Lot

Bake Temp. 110°c Time 24HRS

2. Mounting:

Information on separate sheet.

3. Margining:

Date 1-26-73 Time 1400 Operator RE

Width .100"

Epoxy

Epon 828 Lot 3RH520 Amount 10.0gm

Versamid 125 Lot 2D4788C Amount 10.0gm

M.K. Lot 36782 Amount 40.0gm

4. ~~Prebake Photographs~~ Pinhole plugging

Date 1-28-73 Operator LNS

5. Cold Cycle:

Date 1-30-73 Operator RE

Time in 1425 Temp. -20°c Time Out 1625

6. Sanitizing Bake:

Date 2-2-73 Operator RWR

Time in 1100 Time out 0800

Temp. 60°c Pressure <100u

7. Pre Environmental Test Photograph:

Date Operator N/A

Environmental Testing:

Vibration and acoustic: Date 2-21-73 Carrier Reowing

Vibration specs. NRL-7149-107 -3-10-70 / 2-20-73

Acoustic specs. NRL-7149-107 -3-10-70 / 2-21-73

9. Post Environmental Test Photograph:

Date Operator

FOIL MOUNTING SHEET

Foil Number 961 Type AL Thickness 1580 Å

Date 1-24-73 Time 0910 Operator RE

Epoxy

Type Epco 210/440 MB LOT 8-24 #1 Amount 20.0 gm

Type Epco 180 LOT 12-002 12 Amount 3.9 gm

Comments:

'010" squeeze

Frames

1. Type ATM-2- # 85A Res.
2. Type # Res.
3. Type # Res.
4. Type # Res.
5. Type # Res.
6. Type # Res.
7. Type # Res.
8. Type # Res.
9. Type # Res.
10. Type # Res.
11. Type # Res.
12. Type # Res.
13. Type # Res.
14. Type # Res.
15. Type # Res.
16. Type # Res.

Trim

Date 1-24-73 Time 1415 Operator RE

Comments:

ENVIRONMENTAL TEST

DATE: 2-13-73 SIGMATRON CARRIER: Rachel Gowin

TEST LOCATION: Environmental Laboratory Pt. Mugu

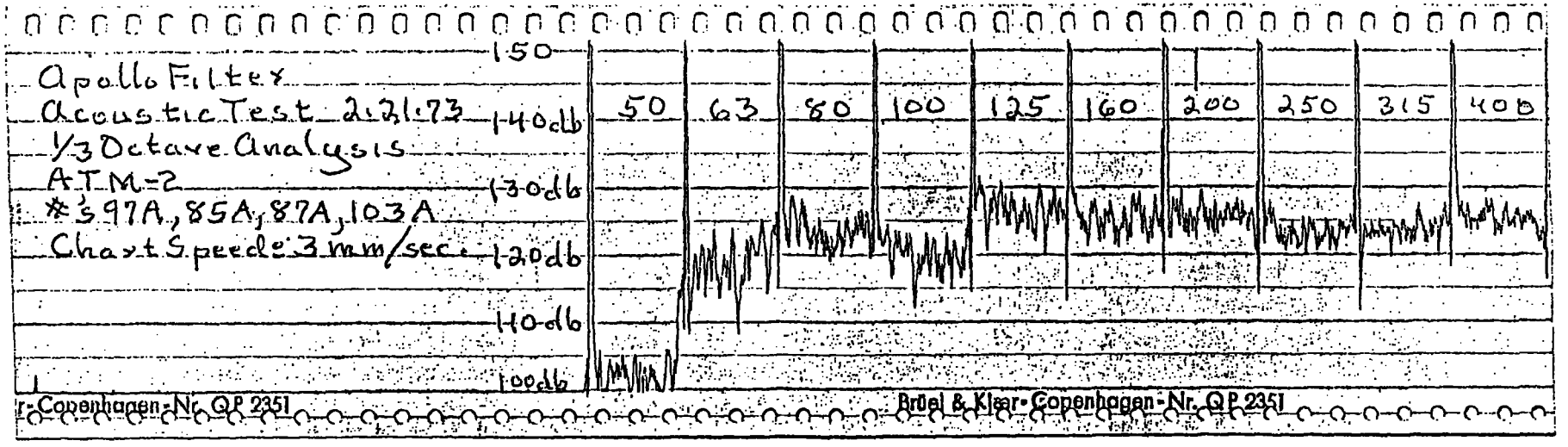
VIBRATION TEST: NRL 7149-107 3-10-70

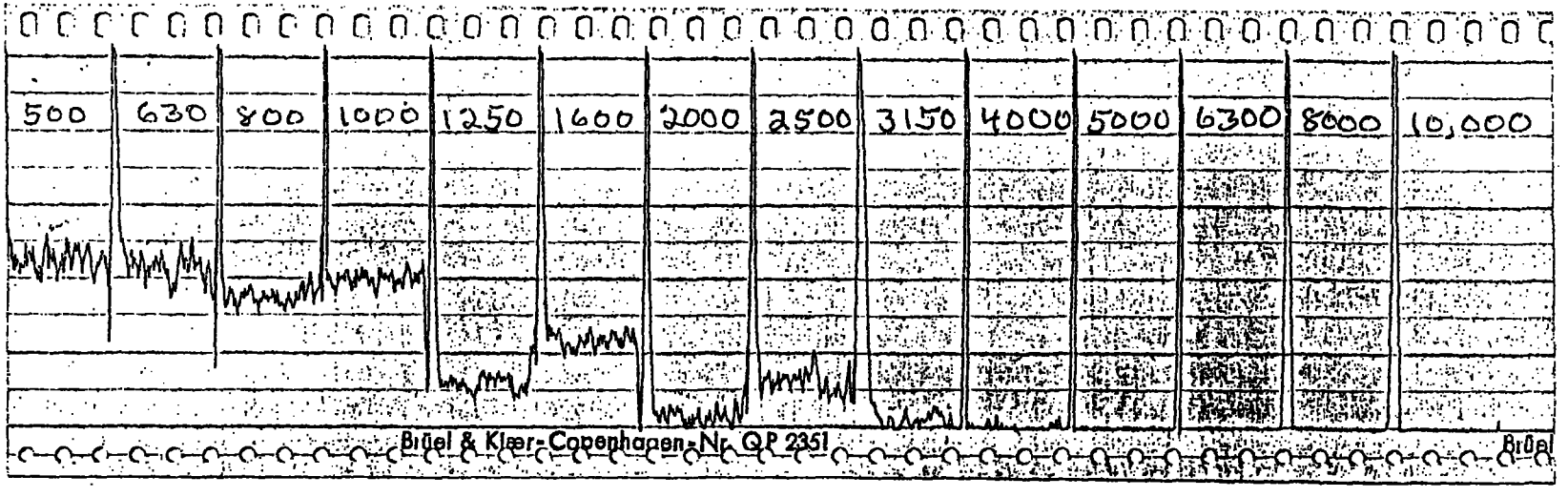
ACOUSTIC TEST: NRL 7149-107 3-10-70

ITEM NO.	FILTER NO.
1	ATM-2-97A
2	" 85-A
3	" 87-A
4	" 103-A

COMMENTS:

Vibration performed 2.20.73
Acoustic " 2.21.73


Apollo Filter
Acoustic Test 2.21.73
1/3 Octave Analysis
ATM-2
*397A, 85A, 87A, 103A
Chart Speed: 3 mm/sec
150
140db
130db
120db
110db
100db
50
63
80
100
125
160
200
250
315
400
Brüel & Kjær-Copenhagen-Nr. QP 2351


500
630
800
1000
1250
1600
2000
2500
3150
4000
5000
6300
8000
10,000
Brüel & Kjær-Copenhagen-Nr. QP 2351

MONITOR 1580 Å RUN 961

A-

620-243

SUBSTRATE

Date _____ Operator [illegible]

Class [illegible] Lot N/A

Cleaning method [illegible] clean rinse, 4th) water pik, rinse with conductivity [illegible]

Parlodion

Type 3.6 Lot 120472

Quantity 2.5 cc.

Time _____

Installation

Date 12-28 Time 1430 Operator [illegible]

Method Wet Hez for 10 min then strip

SOURCE

Date 12-21 Operator SR 1st (2nd) 3rd Run

Material: Filament lot: J-730-A Tantalum lot: C6187

lot: AL 190 Si lot: DO 1777 lot: 10

DEPOSITION

		TIME	PRESSURE
Date 12-28 Operator [illegible]			
Pump down ----------	DATE 12-28	1445	—
Bake out: Temp. N/A Time N/A ----------		—	—
Start Ti pump ----------	Note Runs 1	1520	5.8×10^{-6}
Fill cold trap ----------		1450	5.5×10^{-5}
Fluorescein source on: @ .62A	Warm Optics 2325	1536	1.5×10^{-6}
Fluorescein run: Lot D4-119 Thickness 160Å ------		1600	5.8×10^{-7}
Top SiO source on @ N/A Lot N/A ------		—	—
Bottom SiO source on @ N/A Lot N/A ------		—	—
LN through side plates ----------		1640	3.1×10^{-7}
Ti pump off ----------		1720	6.1×10^{-8}
Source on ----------		1720	6.1×10^{-8}
Run @ 41 ± .5 Set 165		1721	3.5×10^{-6}
Crystal frequency 1.0 to 1.6 Run # 14			
Warm up side plates ----------	2-16 12-29	1723 0945	7.5×10^{-7} D-D

961

SCREEN SHEET

Date 1-4-73 Operator Re
Lot 144160 5-3
Lines/Inch 70
Thickness .0005
Orientation NORMAL

Heat Treatment
Fixture # 3
Date 1-4-73 Operator Re
Temperature 500°C
Time 1HR
Method Vertically suspended with 2 3mil Au wires and 0.45 GM wt.
Comments

Screen Mounting
Fixture # 0
Date 1-8-73 Operator Re
Method Dry Stick/magnetic chuck

Screen Inspection
Date 1-8-73 Operator Re
Comments No Breaks

Polyethylene Preparation
Mounting
Cleaning N/A

Spray Cementing
Date 1-8-73 Operator Re/RWR
Cement
Epon Mixture Amount 20cc 7-17-73
Epon 828 Lot 3RH520 3.4%
Chloroform Lot 40942 96.6%
Versamid Mixture Amount 20cc 7-17-73
Versamid 125 Lot 2847888 3.4%
Chloroform Lot 40942 96.6%
Date Mixed 1-8-73 Operator RLS

Spraying
Tank Pressure 40 PSI
Fluid Pressure 50
Atomizing Pressure 30
Delta Frequency 200 Hz
Seven Minute Bake Time 1620 -1627
Pressing Pressure N/A
Press Fixture Number VACCUUM FIXTURE

Releasing
Remove from press fixture and prepare for release.
Date 01/09/73 Time 1725 Operator RWR

Release Bath
Date 01/09/73 Time 1730 Operator RWR
Solvent Acetone Lot J911105

Remove from release bath and store
Date 01/10/73 Time 1100 Operator RWR
Wash Solvent Acetone Lot J911105
Freon TF Lot 3X-1A

2-17

620-243

This information not supplied

PREFLIGHT FILTER DATA

This information not supplied

Figure 2-5 Post Flight Transmission Data (Sheet 1 of 5)

This information not supplied

Figure 2-5 Post Flight Transmission Data (Sheet 2 of 5)

This information not supplied

Figure 2-5 Post Flight Transmission Data (Sheet 3 of 5)

This information not supplied

Figure 2-5 Post Flight Transmission Data (Sheet 4 of 5)

Figure 2-5 Post Flight Transmission Data (Sheet 5 of 5)

Table 2-4
Post Flight Measurements

11

SL4 ATM FILTERS D.W.A. MEASURED 8 MARCH 1974

FILTER	CAMERA	IDENTIFICATION
ATM-285A	A006	11 (END NEAR NUMBER)
		12(CENTER)
		13(END AWAY FROM NUMBER)
ATM-2-98	A005	21(END NEAR NUMBER)
		22(CENTER)
		23(END AWAY FROM NUMBER)

VODAR 1P21+SS 10KV 35 PPS 200 MICRON SLITS
LIGHT SOURCE PARAMETERS ARE, ARGON LEAKE SETTING ADUSTED FOR MAX READING ON DETECTOR.LIGHT SOURCE PUMPING USED WHEN INCREASED SIGNAL COULD BE OBTAINED

WAVE LEN.	ANG. INC.	REFLEC.	PROB. ERR.	PERCENT ERR.	CHEM. SYM.
717	13.00	0.0793374	0.0006472	0.82	AL
717	12.00	0.0773078	0.0005335	0.69	AL
717	11.00	0.0708338	0.0005558	0.78	AL
717	21.00	0.0799527	0.0005776	0.72	AL
717	22.00	0.0848677	0.0005043	0.59	AL
717	23.00	0.0763560	0.0004056	0.53	AL
717				V = 600 NCS1	AL
704	13.00	0.0515907	0.0001892	0.37	AL
704	12.00	0.0497525	0.0002182	0.44	AL
704	11.00	0.0464272	0.0003355	0.72	AL
704	21.00	0.0539168	0.0003277	0.61	AL
704	22.00	0.0565737	0.0003182	0.56	AL
704	23.00	0.0505680	0.0002638	0.52	AL
704				V = 548 NCS1	AL
685	13.00	0.0480390	0.0002946	0.61	AL
685	12.00	0.0491958	0.0003788	0.77	AL
685	11.00	0.0462994	0.0003569	0.77	AL
685	21.00	0.0566552	0.0005632	0.99	AL
685	22.00	0.0581333	0.0003884	0.67	AL
685	23.00	0.0554784	0.0005417	0.98	AL
685				V = 587 NCS1	AL
662	13.00	0.1331718	0.0007282	0.55	AL
662	12.00	0.1364179	0.0010803	0.79	AL
662	11.00	0.1291881	0.0010811	0.84	AL
662	21.00	0.1449152	0.0010508	0.73	AL
662	22.00	0.1482022	0.0010514	0.71	AL
662	23.00	0.1386747	0.0009475	0.68	AL
662				V = 616 NCS1	AL
640	13.00	0.0898311	0.0005374	0.60	AL
640	12.00	0.0846025	0.0005035	0.60	AL
640	11.00	0.0780417	0.0004592	0.59	AL
640	21.00	0.0937721	0.0006797	0.72	AL
640	22.00	0.1033032	0.0004942	0.48	AL
640	23.00	0.0860927	0.0005726	0.67	AL

640					V = 549 NCS1	AL
620	13.00	0.1412726	0.0013720	0.97		AL
620	12.00	0.1418299	0.0014561	1.03		AL
620	11.00	0.1345135	0.0014566	1.08		AL
620	21.00	0.1475365	0.0013624	0.92		AL
620	22.00	0.1532534	0.0014922	0.97		AL
620	23.00	0.1429444	0.0013684	0.96		AL
620					V = 685 NCS1	AL
586	13.00	0.1401204	0.0005761	0.41		AL
586	12.00	0.1446900	0.0007654	0.53		AL
586	11.00	0.1406411	0.0005301	0.38		AL
586	21.00	0.1558166	0.0007713	0.50		AL
586	22.00	0.1615593	0.0005469	0.34		AL
586	23.00	0.1537905	0.0004173	0.27		AL
586					V = 594 NCS1	AL
560	13.00	0.1467208	0.0005663	0.39		AL
560	12.00	0.1401538	0.0005153	0.37		AL
560	11.00	0.1299086	0.0004997	0.38		AL
560	21.00	0.1478130	0.0005221	0.35		AL
560	22.00	0.1567357	0.0005386	0.34		AL
560	23.00	0.1411269	0.0006309	0.45		AL
560					V = 576 NCS1	AL
540	13.00	0.1546402	0.0005392	0.35		AL
540	12.00	0.1584208	0.0007141	0.45		AL
540	11.00	0.1535542	0.0006704	0.44		AL
540	21.00	0.1670270	0.0005525	0.33		AL
540	22.00	0.1734133	0.0005451	0.31		AL
540	23.00	0.1664578	0.0006094	0.37		AL
540					V = 600 NCS1	AL
530	13.00	0.1881111	0.0007749	0.41		AL
530	12.00	0.1952822	0.0008155	0.42		AL
530	11.00	0.1880197	0.0007338	0.39		AL
530	21.00	0.2023618	0.0007915	0.39		AL
530	22.00	0.2049417	0.0010704	0.52		AL
530	23.00	0.2010797	0.0006363	0.32		AL
530					V = 540 NCS1	AL
513	13.00	0.2089476	0.0010030	0.48		AL
513	12.00	0.2011100	0.0008793	0.44		AL
513	11.00	0.1842061	0.0008052	0.44		AL
513	21.00	0.2050903	0.0010522	0.51		AL
513	22.00	0.2147767	0.0007394	0.34		AL
513	23.00	0.1954985	0.0009856	0.50		AL
513					V = 559 NCS1	AL

482	13.00	0.2085440	0.0005833	0.28		AL
482	12.00	0.2096431	0.0005099	0.24		AL
482	11.00	0.2035683	0.0005612	0.28		AL
482	21.00	0.2198291	0.0005882	0.27		AL
482	22.00	0.2254119	0.0006488	0.29		AL
482	23.00	0.2174606	0.0007892	0.36		AL
482					V = 536 NCS1	AL
461	13.00	0.2147347	0.0006369	0.30		AL
461	12.00	0.2206511	0.0006416	0.29		AL
461	11.00	0.2108744	0.0007371	0.35		AL
461	21.00	0.2324638	0.0006739	0.29		AL
461	22.00	0.2444881	0.0006795	0.28		AL
461	23.00	0.2280872	0.0006250	0.27		AL
461					V = 553 NCS1	AL
440	13.00	0.2394975	0.0008643	0.36		AL
440	12.00	0.2390075	0.0006622	0.28		AL
440	11.00	0.2217607	0.0006149	0.28		AL
440	21.00	0.2432441	0.0008967	0.37		AL
440	22.00	0.2564948	0.0008484	0.33		AL
440	23.00	0.2328313	0.0009401	0.40		AL
440					V = 601 NCS1	AL
420	13.00	0.2393841	0.0010228	0.43		AL
420	12.00	0.2431527	0.0009145	0.38		AL
420	11.00	0.2311413	0.0007229	0.31		AL
420	21.00	0.2521693	0.0010086	0.40		AL
420	22.00	0.2559528	0.0011365	0.44		AL
420	23.00	0.2440997	0.0009457	0.39		AL
420					V = 610 NCS1	AL
400	13.00	0.2862348	0.0014451	0.50		AL
400	12.00	0.2840899	0.0014558	0.51		AL
400	11.00	0.2673820	0.0013654	0.51		AL
400	21.00	0.2907650	0.0015240	0.52		AL
400	22.00	0.3001564	0.0013376	0.45		AL
400	23.00	0.2784326	0.0010296	0.37		AL
400					V = 682 NCS1	AL
380	13.00	0.2812157	0.0013967	0.50		AL
380	12.00	0.2813593	0.0015629	0.56		AL
380	11.00	0.2725907	0.0016549	0.61		AL
380	21.00	0.2927328	0.0015703	0.54		AL
380	22.00	0.2934917	0.0015919	0.54		AL
380	23.00	0.2886613	0.0016546	0.57		AL
380					V = 686 NCS1	AL
380	13.00	0.2769758	0.0014488	0.52		AL
380	12.00	0.2839032	0.0015083	0.53		AL
380	11.00	0.2770065	0.0017521	0.63		AL

380	21.00	0.2959643	0.0014644	0.49		AL
380	22.00	0.3041234	0.0015684	0.52		AL
380	23.00	0.2941410	0.0014682	0.50		AL
380					V = 690 NCS1	AL
355	13.00	0.3002507	0.0015070	0.50		AL
355	12.00	0.2967273	0.0016285	0.55		AL
355	11.00	0.2822596	0.0014424	0.51		AL
355	21.00	0.3075953	0.0015213	0.49		AL
355	22.00	0.3140739	0.0015502	0.49		AL
355	23.00	0.2924036	0.0016249	0.56		AL
355					V = 705 NCS1	AL
334	13.00	0.3178880	0.0006218	0.20		AL
334	12.00	0.3195609	0.0006932	0.22		AL
334	11.00	0.3022699	0.0009415	0.31		AL
334	21.00	0.3274564	0.0009047	0.28		AL
334	22.00	0.3381544	0.0007924	0.23		AL
334	23.00	0.3164216	0.0008369	0.26		AL
334					V = 603 NCS1	AL
304	13.00	0.3284963	0.0012063	0.37		AL
304	12.00	0.3373542	0.0014565	0.43		AL
304	11.00	0.3166384	0.0009926	0.31		AL
304	21.00	0.3439392	0.0012554	0.36		AL
304	22.00	0.3548613	0.0012484	0.35		AL
304	23.00	0.3376019	0.0008313	0.25		AL
304					V = 619 NCS1	AL
284	13.00	0.3481321	0.0009820	0.28		AL
284	12.00	0.3469671	0.0011029	0.32		AL
284	11.00	0.3458179	0.0013578	0.39		AL
284	21.00	0.3655801	0.0013987	0.38		AL
284	22.00	0.3655700	0.0012464	0.34		AL
284	23.00	0.3634486	0.0011852	0.33		AL
284					V = 568 NCS1	AL
270	13.00	0.3563796	0.0017848	0.50		AL
270	12.00	0.3839446	0.0017287	0.45		AL
270	11.00	0.3495270	0.0021829	0.62		AL
270	21.00	0.3823806	0.0019475	0.51		AL
270	22.00	0.4012615	0.0025028	0.62		AL
270	23.00	0.3707126	0.0022670	0.61		AL
270					V = 622 NCS1	AL
260	13.00	0.3807337	0.0015833	0.42		AL
260	12.00	0.3882765	0.0015704	0.40		AL
260	11.00	0.3666830	0.0014009	0.38		AL
260	21.00	0.3891323	0.0010253	0.26		AL
260	22.00	0.3930131	0.0016766	0.43		AL
260	23.00	0.3757969	0.0012859	0.34		AL

260					V = 561 NCS1	AL
230	13.00	0.4396647	0.0008599	0.20		AL
230	12.00	0.4409403	0.0010100	0.23		AL
230	11.00	0.4276657	0.0011724	0.27		AL
230	21.00	0.4408885	0.0013548	0.31		AL
230	22.00	0.4514978	0.0015528	0.34		AL
230	23.00	0.4381713	0.0012250	0.28		AL
230					V = 573 NCS1	AL
192	13.00	0.4938297	0.0021995	0.45		AL
192	12.00	0.5013055	0.0017534	0.35		AL
192	11.00	0.4842862	0.0019526	0.40		AL
192	21.00	0.5022079	0.0016782	0.33		AL
192	22.00	0.5055053	0.0017311	0.34		AL
192	23.00	0.4938094	0.0019203	0.39		AL
192					V = 552 NCS1	AL
175	13.00	0.4978822	0.0018445	0.37		AL
175	12.00	0.4901043	0.0020686	0.42		AL
175	11.00	0.4702887	0.0018980	0.40		AL
175	21.00	0.4879449	0.0015816	0.32		AL
175	22.00	0.4812774	0.0021912	0.46		AL
175	23.00	0.4658488	0.0021774	0.47		AL
175					V = 646 NCS1	AL
168	13.00	0.0961370	0.0006788	0.71		AL
168	12.00	0.0938242	0.0006941	0.74		AL
168	11.00	0.0896511	0.0005608	0.63		AL
168	21.00	0.0924365	0.0008203	0.89		AL
168	22.00	0.0937739	0.0007298	0.78		AL
168	23.00	0.0904656	0.0007123	0.79		AL
168					V = 649 NCS1	AL
160	13.00	0.0851419	0.0006541	0.77		AL
160	12.00	0.0814625	0.0005879	0.72		AL
160	11.00	0.0778235	0.0004651	0.60		AL
160	21.00	0.0819432	0.0005030	0.61		AL
160	22.00	0.0834639	0.0005721	0.69		AL
160	23.00	0.0804719	0.0004174	0.52		AL
160					V = 608 NCS1	AL
150	13.00	0.0656866	0.0005848	0.89		AL
150	12.00	0.0639986	0.0004501	0.70		AL
150	11.00	0.0602522	0.0004964	0.82		AL
150	21.00	0.0635965	0.0004698	0.74		AL
150	22.00	0.0658804	0.0004850	0.74		AL
150	23.00	0.0629847	0.0008569	1.36		AL
150					V = 688 NCS1	AL

Between Columns 5 and 6, entries of the type "V = 750NCJ1" are for the operator's information only.

Column 6 Chemical symbol designates the metal of which the filter was made.

From 5 to 11 lines are used at the top of each first page to describe the items being measured and the conditions of measurement; i.e., type of monochromate, light source, etc.

2.6 CAMERA HISTORY

The camera Life History consists of a historical record (see Table 2-5) of the camera from the beginning of its production functional testing to the period of crew compartment fit function (C^2F^2) testing.

Operating Cycles

Column No. 1 identifies total operating cycles and starts with the initiation of production functional tests. This is the point where the camera has become an assembled and adjusted end item. For both cameras the number of cycles relates to the number of film holders transferred from the upper level to the lower level. The number of film exposures for the S082B camera is acquired by multiplying this number by eight.

Column No. 2 identifies the number of operating cycles since the last major relubrication was performed per maintenance specification 37102 (S082A) and 37103 (S082B).

Column No. 3 identifies the number of operating cycles since the last lubrication of an area exhibiting a failure condition possibly related to lubrication wearout.

Table 2-5

S/N A006 HRE

FILM CAMERA LIFE HISTORY

CAMERA SER. NO. A-006

Date	Test Location	Test Description	Nonconf. Rpt No.	Failure Mode	Failure Cause	Failure Corrective Action	Operating Cycles 1	2	3	Type of Lubrication on Failure Area	Environment	Camera Configuration	Remarks
12-09-70 12-16-70	BBRC	Production - Functional (35854)	N/A	N/A			1044				Ambient - clean room	36360, Rev F	
12-21-70	BBRC	I&T Instrument compatibility (36636) on Flight Instrument	NMR 26090 RDR 1282	Camera locks out but allows down count.	Cam setting for motor switch actuation was too close to the lock out position.	Switch readjusted per new engr. criteria.	1094				Ambient - clean room	34360, Rev N	
03-05-71 03-23-71	BBRC	Production - Incorporate retractor mod and various EO's.	N/A				1094				Ambient - clean room	23810, Rev AD 23748, Rev C 26880, Rev D 23740, Rev AG 23812, Rev J 23839, Rev D	Camera configuration verified to CIL, Rev G, dated 2-22-71.
06-10-71	BBRC	Production - Incorporate EO's.	N/A				1144					23810, Rev AM 34360, Rev T 23823, Rev E 30530, Rev C	Rework to latest engrg in progress on 10-15-71.
Revision A dated 4 February 1972													
09-28-71 12-16-71	BBRC	Production - Incorporate escapement mod. and outstanding EO's					1144				Ambient - clean room	23740, Rev AN 23788, Rev G 23786, Rev J 23757, Rev J 23756, Rev H 22721, Rev U 23813, Rev G 23811, Rev L 22726, Rev D 34360, Rev V 23826, Rev B 23665, Rev H 26825, Rev E	Configuration per Rev N of CIL (includes escapement redesign per ECP PPD-032, identification of film load on back plate and falling film holder fix per ECP PPD-033).
12-17-71 01-10-72	BBRC	Production - Functional (35854)					1696				Ambient - clean room		
01-11-72	BBRC	I&T - Physical Measurements (30557)					1696				Ambient - clean room		

CAMERA SER. NO. A006

Date	Test Location	Test Description	Nonconf. Rpt No.	Failure Mode	Failure Cause	Failure Corrective Action	Operating Cycles 1	2	3	Type of Lubrication on Failure Area	Environment	Camera Configuration	Remarks
01-11-72 01-13-72	BBRC	I&T - Pre-Acceptance (30558)					1720				Ambient - clean room		
01-14-72 01-17-72	BBRC	I&T - Vibration (30559)					1930				Random in canister		
01-17-72 01-24-72	BBRC	I&T - Thermal Vacuum (30560)					2139				1×10^{-5} torr 120 hrs		
Revision B dated 9 June 1972													
01-24-72 02-01-72	BBRC	I&T - Post Thermal Vacuum (30561)	NMR 26928	Film plane out-of-spec 0.0022" for gage block no. 1.	Carrier position indicator misread.	Personnel associated with optical tests cautioned with regard to maintaining proper (+) & (-) assignments. Absence of carrier shift verified by Production apex measurements.	2153				Ambient - clean room		
02-24-72	BBRC	Camera clean-up	NMR 27100				2153				Ambient - clean room		
03-09-72	BBRC	Post clean-up functional (30561)	NMR 27100				2168				Ambient - clean room		
03-10-72	BBRC	IR & UV contamination inspection per MSFC log book and delivery to MSFC.					2168				Ambient - clean room & hand carry in special camera case.		

CAMERA SER. NO. A006

Date	Test Location	Test Description	Nonconf. Rpt No.	Failure Mode	Failure Cause	Failure Corrective Action	Operating Cycles 1	2	3	Type of Lubrication on Failure Area	Environment	Camera Configuration	Remarks
03-13-72 03-24-72	MSFC	PMC tests on flight ATM.	MSFC NR 13401	Failed to complete 13th cy on S-082A			2267				Ambient - clean room		Camera returned to BBRC for failure analysis.
03-27-72 05-17-72	BBRC	Failure analysis & repair	NMR 27187 FR 2418		Binding of shuttles due interference with back plate.	Adjustment specification revised to specify proper clearance between back plate and shuttle transfer plate.	2569				Ambient - clean room	34360, Rev AD 37102, Rev E	
05-18-72	BBRC	4000 cy maintenance per dwg 37102					2657				Ambient - clean room		
05-18-72 05-20-72	BBRC	Post repair tests: Pre-Accept (30558) Vibration (30559) Thermal Vac (30560) Post Thermal Vac (30561)					3106	537			Ambient - clean room; X-axis random vib; 1 x 10^{-5} torr		Scope of tests identified in NMR 27187.
05-20-72	BBRC	IR & UV contamination inspection per MSFC log book and delivery to MSFC.					3106	537			Ambient - clean room & hand carry in special camera case.		
05-21-72 06-13-72	MSFC	Flt ATM Vibration					3309				Flt ATM Vibration levels.		Compliance run completed at MSFC prior to installation on S-082A.

CAMERA SER. NO. A006

Date	Test Location	Test Description	Nonconf. Rpt No.	Failure Mode	Failure Cause	Failure Corrective Action	Operating Cycles 1	2	3	Type of Lubrication on Failure Area	Environment	Camera Configuration	Remarks
Revision	C dated	15 February,	1973										
06-14-72 12-06-72	MSFC MSC KSC	Support Flight Instrument		None							Ambient Clean Room Vibration		
12-08-72	BBRC	Storage					4104				Ambient Clean Room		

Type of Lubrication on Failure Area

Various process specifications are identified in this column with most being BBRC proprietary processes. Brief descriptions of each are as follows:

No.	Description
NPI 425	Dry film, polyimide bonded lubricant - a proprietary process of National Process Industries. It is the same as Midwest Research's MLR-2 lubricant.
BMS 18.20	Slurry of molybdenum disulfide (MoS_2) in volatile solvents - generally applied when specified by maintenance documents 37102 and 37103 and then burnished by cycling the camera approximately 50 cycles.
BPS 18.02 or 18.06	Burnished coating of MoS_2 (mechanical adhesion only).
BPS 18.07	BBRC's equivalent of MLR-2 polyimide, dry lubricant coating.
SPS 18.09	Relubrication procedure - special process for sequencing the use of BPS 18.06 and 18.07 to lubricate film camera peculiar parts. Implemented in the 37102 and 37103 documents.

DIODE ARRAY DATA

3.0 DIODE ARRAY DATA

The diode array was located immediately adjacent to the camera mounting plate and consisted of a light emitting diode array and a lens assembly. The diode array system projected binary coded decimal time onto the film chip for exposures of 0.25 second or longer. Twenty-five bits of time of day data were recorded at shutter open and 13 least significant bits were recorded at shutter close. NRL developed the film chips, decoded and stored the data and produced a computer printout. BBRC assisted by editing the computer printout.

The time of day recorded by the diode array is mission elapsed time (MET) and is furnished by an ATM on-board computer. This computer time varied from Greenwich Mean Time (GMT) by as much as a few seconds and, therefore, required periodic updates by ground command. These updates are listed in NASA MSFC Memorandum MO-I-35-74, Subject: ATMDC Timer Updates, dated March 26, 1974.

Rev A

DOY	Day of Year
EXP TIME	Duration of Exposure

The wavelengths (λ) shown on the computer printout are manually read from the spectrograph prints and entered in the computer printout.

Rev A

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
MARSHALL SPACE FLIGHT CENTER, ALABAMA 35812

REPLY TO ATTN OF: MO-I-35-74

March 26, 1974

TO: Distribution

FROM: MO-I/Harvey Golden

SUBJECT: ATMDC Timer Updates

Enclosed is a list of ATMDC timer updates. These updates were taken from the MDRS Position Log at JSC. Although some of this information is difficult to decipher, it seems to be the best source available on timer updates. If questions arise concerning the list they should be directed to Steve Bales of the Flight Computer Section (483-3421) at JSC and discussed with someone who manned the ASCO position during the Skylab Mission. I have included a copy of the MDRS Position Log for your information.

ATMDC Timer Updates (Onboard Time)

Timer B was used in the beginning of the mission until DOY 154 when ATMDC switchover occurred. Timer A was used for the remainder of the mission except for DOY 157 when ASCO tried the Timer B again. Below is a list of clock updates and explanation as well as can be deciphered from the MDRS Position Log. These times were provided to MDRS by ASCO as he completed each timer update. All Delta updates are negative values.

2

GMT OF CLOCK RESET	ZERO SET TIME	DELTA UPDATE	COMMENTS
144:02:05:10.000	134:00:00:00.000	-11 Sec	Timer B update
148:07:40:00.0	-	-11 Sec	Timer B update
154:12:22:10.749	134:00:00:00.000	-4 Sec	Timer A update over HSK
157:01:50:00	133:23:59:44.780	-	Timer B selected
157:03:33:00	-	-18 Sec	Timer B update
157:04:09:00	-	-	Timer A selected
160:16:38:00	133:23:59:55.876	-	Changed from a timer in primary computer to a timer in secondary computer that was driven by Timer B.
162:17:16:44	-	-4 Sec	Timer A update
178:19:07:00	178:19:07:00	-4 Sec	Timer A update
189:16:02:00	134:00:00:00.401	-3 Sec	Timer A update
198:00:00:00	064:00:00:00	-	64 day clock rollover
197:23:59:57	-	-3 Sec	Timer A update over GDS
205:19:43:49	-	-3 Sec	Timer A update
219:06:13:33	198:00:00:01.553	-5 Sec	Timer A update
230:16:44:47	-	-4 Sec	Timer A update
246:01:38:00	-	-4 Sec	Timer A update
256:04:50:50	198:00:00:00.301	-3 Sec	Timer A update
267:03:17:21.277	262:00:00:01.277	-4 Sec	Timer A update
280:04:45:20.988	262:00:00:00.988	-4 Sec	Timer A update
288:07:30:00	-	-3 Sec	Timer A update
297:07:25:53	262:00:00:01.168	-3 Sec	Timer A update
306:16:10:50	262:00:00:00.775	-3 Sec	Timer A update
316:22:35:43	054:22:35:43	-3 Sec	Timer A update
326:00:00:00	000:00:00:00	-	Timer Reset
331:04:09:47	326:00:00:00.101	-3 Sec	Timer A update
342:10:29:02	-	-3 Sec	Timer A update
353:04:27:09	027:04:27:09	-3 Sec	Timer A update
367:02:51:20	041:02:51:20	-3 Sec	Timer A update
388:04:06:00	062:04:06:00	-3 Sec	Timer A update
390:00:00:01.911	008:19:30:51.249	-4 Sec	Timer A update

for Harvey Golden

Enclosure

FILM NR	DATE	DOY	SHUTTER OPEN	CLOSE	EXP TIME	WAVELENGTH
3A 1	NOV 22,73	326	19H 10M 53.25S	10M 54.50S	1.25S	SHORT
3A 2	NOV 27,73	331	1H 27M 33.00S	28M 32.00S	59.00S	LONG
3A 3	NOV 27,73	331	1H 29M 31.75S	29M 51.00S	19.25S	SHORT
3A 4	NOV 27,73	331	13H 58M 51.75S	0M 12.25S	80.50S	LONG
3A 5	NOV 27,73	331	14H 1M 2.00S	1M 22.00S	20.00S	SHORT
3A 6	NOV 28,73	332	14H 44M 57.50S	45M 56.75S	59.25S	LONG
3A 7	NOV 28,73	332	14H 51M 7.00S	51M 25.75S	18.75S	SHORT
3A 8	NOV 28,73	332	17H 51M 31.50S	52M 31.25S	59.75S	LONG
3A 9	NOV 28,73	332	17H 58M 54.50S	59M 54.50S	60.00S	LONG
3A 10	NOV 28,73	332	18H 0M 23.25S	1M 22.25S	59.00S	LONG
3A 11	NOV 28,73	332	18H 1M 54.25S	2M 53.25S	59.00S	LONG
3A 12	NOV 28,73	332	18H 3M 24.50S	4M 23.25S	58.75S	LONG
3A 13	NOV 28,73	332	18H 4M 54.75S	5M 54.25S	59.50S	LONG
3A 14	NOV 28,73	332	18H 6M 24.25S	7M 23.25S	59.00S	LONG
3A 15	NOV 28,73	332	18H 7M 54.75S	8M 54.25S	59.50S	LONG
3A 16	NOV 28,73	332	18H 9M 24.50S	10M 24.25S	59.75S	LONG
3A 17	NOV 28,73	332	18H 10M 59.50S	11M 59.25S	59.75S	LONG
3A 18	NOV 28,73	332	18H 12M 26.00S	13M 25.25S	59.25S	LONG
3A 19	NOV 28,73	332	18H 13M 54.50S	14M 54.25S	59.75S	LONG
3A 20	NOV 28,73	332	18H 15M 24.25S	16M 23.25S	59.00S	LONG
3A 21	NOV 28,73	332	18H 16M 54.25S	17M 53.00S	58.75S	LONG
3A 22	NOV 28,73	332	18H 18M 24.25S	19M 23.00S	58.75S	LONG
3A 23	NOV 28,73	332	18H 19M 54.75S	20M 54.00S	59.25S	LONG
3A 24	NOV 28,73	332	18H 21M 24.50S	22M 23.00S	58.50S	LONG
3A 25	NOV 28,73	332	18H 22M 54.25S	23M 53.00S	58.75S	LONG
3A 26	NOV 28,73	332	18H 24M 24.25S	25M 23.00S	58.75S	LONG
3A 27	NOV 28,73	332	18H 27M 22.75S	28M 22.00S	59.25S	LONG
3A 28	NOV 29,73	333	14H 14M 25.00S	15M 24.50S	59.50S	LONG
3A 29	NOV 29,73	333	14H 16M 17.50S	16M 36.50S	19.00S	SHORT
3A 30	NOV 29,73	333	17H 10M 31.00S	10M 40.00S	9.00S	SHORT
3A 31	NOV 30,73	334	14H 54M 49.00S	55M 48.00S	59.00S	LONG
3A 32	NOV 30,73	334	14H 57M 8.00S	57M 27.00S	19.00S	SHORT
3A 33	DEC 1,73	335	1H 46M 32.25S	47M 31.25S	59.00S	LONG
3A 34	DEC 1,73	335	1H 48M 29.75S	48M 49.25S	19.50S	SHORT
3A 35	DEC 1,73	335	15H 50M 11.00S	51M 10.50S	59.50S	LONG
3A 36	DEC 1,73	335	15H 53M 12.75S	53M 31.50S	18.75S	SHORT
3A 37	DEC 2,73	336	15H 4M 9.25S	5M 8.50S	59.25S	LONG
3A 38	DEC 2,73	336	15H 6M 38.50S	6M 57.50S	19.00S	SHORT
3A 39	DEC 2,73	336	15H 15M 40.00S	16M 24.50S	44.50S	SHORT
3A 40	DEC 2,73	336	15H 16M 38.75S	16M 39.50S	0.75S	SHORT
3A 41	DEC 2,73	336	15H 16M 54.00S	16M 56.50S	2.50S	SHORT
3A 42	DEC 2,73	336	15H 16M 58.50S	17M 8.25S	9.75S	SHORT
3A 43	DEC 2,73	336	15H 17M 10.50S	17M 50.25S	39.75S	SHORT
3A 44	DEC 2,73	336	15H 17M 52.25S	17M 57.00S	4.75S	LONG
3A 45	DEC 2,73	336	15H 17M 59.25S	18M 7.75S	8.50S	LONG
3A 46	DEC 3,73	337	12H 53M 3.00S	54M 2.50S	59.50S	LONG
3A 47	DEC 3,73	337	12H 55M 21.50S	55M 40.50S	19.00S	SHORT
3A 48	DEC 4,73	338	2H 48M 37.25S	48M 56.25S	19.00S	SHORT
3A 49	DEC 4,73	338	13H 47M 6.50S	48M 5.50S	59.00S	LONG
3A 50	DEC 4,73	338	13H 49M 46.50S	50M 5.50S	19.00S	SHORT

FILM NR	DATE	DOY	SHUTTER OPEN	CLOSE	EXP TIME	WAVELENGTH
3A 51	DEC 4.73	338	14H 23M 2.25S	24M 1.50S	59.25S	LONG
3A 52	DEC 4.73	338	14H 26M 38.50S	26M 57.50S	19.00S	SHORT
3A 53	DEC 5.73	339	13H 0M 10.25S	1M 9.25S	59.00S	LONG
3A 54	DEC 5.73	339	13H 3M 4.25S	3M 23.25S	19.00S	SHORT
3A 55	DEC 6.73	340	14H 2M 49.25S	3M 48.25S	59.00S	LONG
3A 56	DEC 6.73	340	14H 5M 16.00S	5M 35.25S	19.25S	SHORT
3A 57	DEC 7.73	341	12H 11M 29.00S	12M 28.00S	59.00S	LONG
3A 58	DEC 7.73	341	20H 55M 18.50S	55M 37.75S	19.25S	SHORT
3A 59	DEC 8.73	342	12H 45M 26.75S	46M 25.25S	58.50S	LONG
3A 60	DEC 8.73	342	12H 48M 14.00S	48M 33.25S	19.25S	SHORT
3A 61	DEC 8.73	342	15H 51M 4.50S	29M 3.75S	2279.25S	SHORT
3A 62	DEC 9.73	343	13H 24M 2.25S	25M 1.75S	59.50S	LONG
3A 63	DEC 9.73	343	13H 27M 15.50S	27M 34.75S	19.25S	SHORT
3A 64	DEC 10.73	344	15H 47M 6.00S	48M 7.75S	61.75S	LONG
3A 65	DEC 10.73	344	15H 48M 30.50S	48M 49.75S	19.25S	SHORT
3A 66	DEC 10.73	344	23H 46M 3.50S	51M 2.25S	298.75S	LONG
3A 67	DEC 11.73	345	0H 9M 46.00S	10M 15.25S	29.25S	LONG
3A 68	DEC 11.73	345	0H 10M 36.25S	10M 45.25S	9.00S	SHORT
3A 69	DEC 11.73	345	15H 5M 29.00S	6M 28.25S	59.25S	LONG
3A 70	DEC 11.73	345	15H 6M 52.75S	7M 12.25S	19.50S	SHORT
3A 71	DEC 11.73	345	16H 40M 23.50S	41M 43.00S	79.50S	LONG
3A 72	DEC 11.73	345	16H 52M 5.75S	52M 45.00S	39.25S	SHORT
3A 73	DEC 11.73	345	18H 12M 1.25S	17M 20.75S	319.50S	LONG
3A 74	DEC 11.73	345	18H 19M 37.00S	22M 15.75S	158.75S	SHORT
3A 75	DEC 12.73	346	16H 0M 4.00S	1M 3.75S	59.75S	LONG
3A 76	DEC 12.73	346	16H 2M 8.50S	2M 27.75S	19.25S	SHORT
3A 77	DEC 13.73	347	2H 50M 40.25S	53M 19.75S	159.50S	LONG
3A 78	DEC 13.73	347	2H 54M 1.00S	55M 19.75S	78.75S	SHORT
3A 79	DEC 13.73	347	13H 52M 16.25S	53M 15.50S	59.25S	LONG
3A 80	DEC 13.73	347	13H 53M 49.25S	54M 8.50S	19.25S	SHORT
3A 81	DEC 14.73	348	1H 5M 21.75S	6M 1.00S	39.25S	SHORT
3A 82	DEC 14.73	348	1H 6M 33.75S	9M 13.00S	159.25S	LONG
3A 83	DEC 14.73	348	14H 36M 4.75S	37M 4.00S	59.25S	LONG
3A 84	DEC 14.73	348	14H 38M 30.75S	38M 50.00S	19.25S	SHORT
3A 85	DEC 14.73	348	21H 33M 47.75S	34M 30.25S	42.50S	SHORT
3A 86	DEC 15.73	349	1H 28M 15.75S	29M 15.50S	59.75S	LONG
3A 87	DEC 15.73	349	1H 29M 45.25S	30M 4.50S	19.25S	SHORT
3A 88	DEC 15.73	349	1H 41M 4.25S	41M 23.50S	19.25S	SHORT
3A 89	DEC 15.73	349	1H 41M 39.00S	42M 38.50S	59.50S	LONG
3A 90	DEC 15.73	349	13H 57M 3.25S	58M 2.25S	59.00S	LONG
3A 91	DEC 15.73	349	13H 58M 21.50S	58M 40.25S	18.75S	SHORT
3A 92	DEC 16.73	350	2H 19M 33.00S	22M 12.25S	159.25S	LONG
3A 93	DEC 16.73	350	2H 22M 41.25S	24M 0.25S	79.00S	SHORT
3A 94	DEC 16.73	350	13H 14M 7.50S	15M 6.50S	59.00S	LONG
3A 95	DEC 16.73	350	13H 16M 29.50S	16M 48.50S	19.00S	SHORT
3A 96	DEC 16.73	350	13H 54M 45.00S	55M 24.75S	39.75S	SHORT
3A 97	DEC 16.73	350	19H 36M 34.50S	37M 14.00S	39.50S	SHORT
3A 98	DEC 16.73	350	19H 43M 13.75S	44M 13.00S	59.25S	LONG
3A 99	DEC 16.73	350	20H 9M 10.50S	9M 30.25S	19.75S	SHORT
3A100	DEC 16.73	350	20H 10M 6.50S	10M 9.00S	2.50S	SHORT

FILM NR	DATE	DOY	SHUTTER OPEN	CLOSE	EXP TIME	WAVELENGTH
3A101	DEC 16.73	350	20H 10M 11.00S	10M 21.00S	10.00S	SHORT
3A102	DEC 16.73	350	20H 10M 23.00S	11M 2.75S	39.75S	SHORT
3A103	DEC 16.73	350	20H 11M 4.75S	11M 9.75S	5.00S	LONG
3A104	DEC 16.73	350	20H 11M 11.75S	11M 31.50S	19.75S	LONG
3A105	DEC 16.73	350	20H 11M 33.50S	12M 53.25S	79.75S	LONG
3A106	DEC 16.73	350	20H 12M 55.25S	12M 57.50S	2.25S	SHORT
3A107	DEC 16.73	350	20H 12M 59.75S	13M 9.50S	9.75S	SHORT
3A108	DEC 16.73	350	20H 13M 11.50S	13M 51.25S	39.75S	SHORT
3A109	DEC 16.73	350	20H 13M 53.25S	14M 3.25S	10.00S	SHORT
3A110	DEC 16.73	350	20H 14M 5.25S	14M 27.25S	22.00S	SHORT
3A111	DEC 16.73	350	20H 59M 45.75S	0M 4.75S	19.00S	SHORT
3A112	DEC 16.73	350	22H 51M 4.50S	52M 3.50S	59.00S	LONG
3A113	DEC 17.73	351	0H 3M 17.00S	3M 36.25S	19.25S	SHORT
3A114	DEC 17.73	351	0H 31M 55.25S	32M 9.25S	14.00S	SHORT
3A115	DEC 17.73	351	0H 33M 19.00S	33M 21.25S	2.25S	SHORT
3A116	DEC 17.73	351	0H 33M 23.50S	33M 33.25S	9.75S	SHORT
3A117	DEC 17.73	351	0H 33M 35.25S	34M 15.00S	39.75S	SHORT
3A118	DEC 17.73	351	0H 34M 17.25S	34M 22.00S	4.75S	LONG
3A119	DEC 17.73	351	0H 34M 24.00S	34M 44.00S	20.00S	LONG
3A120	DEC 17.73	351	0H 34M 46.00S	36M 5.50S	79.50S	LONG
3A121	DEC 17.73	351	0H 36M 7.50S	36M 10.00S	2.50S	SHORT
3A122	DEC 17.73	351	0H 36M 12.00S	36M 22.00S	10.00S	SHORT
3A123	DEC 17.73	351	0H 36M 24.00S	37M 3.75S	39.75S	SHORT
3A124	DEC 17.73	351	0H 37M 5.75S	37M 15.75S	10.00S	SHORT
3A125	DEC 17.73	351	0H 37M 17.75S	37M 57.50S	39.75S	SHORT
3A126	DEC 17.73	351	0H 37M 59.50S	40M 38.75S	159.25S	SHORT
3A127	DEC 17.73	351	0H 40M 40.75S	40M 50.50S	9.75S	LONG
3A128	DEC 17.73	351	0H 40M 52.75S	41M 32.50S	39.75S	LONG
3A129	DEC 17.73	351	0H 41M 34.50S	44M 13.75S	159.25S	LONG
3A130	DEC 17.73	351	0H 44M 15.75S	44M 18.00S	2.25S	SHORT
3A131	DEC 17.73	351	0H 44M 20.25S	44M 30.00S	9.75S	SHORT
3A132	DEC 17.73	351	0H 44M 32.00S	45M 11.75S	39.75S	SHORT
3A133	DEC 17.73	351	0H 45M 14.00S	45M 23.75S	9.75S	SHORT
3A134	DEC 17.73	351	0H 45M 25.75S	46M 5.50S	39.75S	SHORT
3A135	DEC 17.73	351	0H 46M 7.50S	48M 46.75S	159.25S	SHORT
3A136	DEC 17.73	351	0H 48M 48.75S	48M 58.75S	10.00S	LONG
3A137	DEC 17.73	351	0H 49M 0.75S	49M 40.50S	39.75S	LONG
3A138	DEC 17.73	351	0H 49M 42.50S	52M 21.75S	159.25S	LONG
3A139	DEC 17.73	351	1H 39M 8.00S	39M 27.00S	19.00S	SHORT
3A140	DEC 17.73	351	1H 49M 30.50S	49M 49.00S	18.50S	SHORT
3A141	DEC 17.73	351	1H 59M 59.50S	0M 59.00S	59.50S	SHORT
3A142	DEC 17.73	351	2H 11M 21.75S	11M 41.00S	19.25S	SHORT
3A143	DEC 17.73	351	2H 12M 2.25S	13M 1.00S	58.75S	LONG
3A144	DEC 17.73	351	15H 37M 29.25S	38M 27.75S	58.50S	LONG
3A145	DEC 17.73	351	15H 39M 18.25S	39M 37.75S	19.50S	SHORT
3A146	DEC 17.73	351	23H 26M 36.00S	26M 54.75S	18.75S	SHORT
3A147	DEC 18.73	352	13H 24M 26.25S	25M 25.25S	59.00S	LONG
3A148	DEC 18.73	352	13H 25M 39.75S	25M 59.25S	19.50S	SHORT
3A149	DEC 19.73	353	6H 32M 7.00S	32M 17.00S	10.00S	SHORT
3A150	DEC 19.73	353	6H 32M 19.00S	32M 38.75S	19.75S	LONG

FILM NR	DATE	DOY	SHUTTER OPEN	CLOSE	EXP TIME	WAVELENGTH
3A151	DEC 19.73	353	6H 32M 40.75S	33M 20.50S	39.75S	SHORT
3A152	DEC 19.73	353	6H 33M 22.75S	34M 42.25S	79.50S	LONG
3A153	DEC 19.73	353	6H 34M 44.25S	37M 23.50S	159.25S	SHORT
3A154	DEC 19.73	353	6H 37M 25.50S	42M 44.00S	318.50S	LONG
3A155	DEC 19.73	353	12H 59M 39.75S	1M 39.00S	119.25S	LONG
3A156	DEC 19.73	353	13H 8M 55.50S	9M 35.00S	39.50S	SHORT
3A157	DEC 19.73	353	14H 19M 56.75S	20M 56.25S	59.50S	LONG
3A158	DEC 19.73	353	14H 21M 15.50S	21M 35.25S	19.75S	SHORT
3A159	DEC 19.73	353	19H 38M 30.50S	38M 49.25S	18.75S	SHORT
3A160	DEC 19.73	353	20H 27M 3.00S	27M 22.25S	19.25S	SHORT
3A161	DEC 19.73	353	20H 40M 49.25S	41M 8.25S	19.00S	SHORT
3A162	DEC 20.73	354	13H 34M 50.25S	35M 49.75S	59.50S	LONG
3A163	DEC 20.73	354	13H 36M 48.25S	37M 7.75S	19.50S	SHORT
3A164	DEC 20.73	354	15H 18M 25.75S	18M 44.50S	18.75S	SHORT
3A165	DEC 20.73	354	16H 57M 34.50S	57M 54.25S	19.75S	SHORT
3A166	DEC 20.73	354	20H 2M 32.25S	2M 51.75S	19.50S	SHORT
3A167	DEC 20.73	354	22H 53M 41.50S	53M 54.00S	12.50S	SHORT
3A168	DEC 21.73	355	2H 21M 52.75S	22M 52.00S	59.25S	LONG
3A169	DEC 21.73	355	2H 23M 14.75S	23M 34.00S	19.25S	SHORT
3A170	DEC 21.73	355	12H 55M 59.75S	56M 8.50S	8.75S	SHORT
3A171	DEC 21.73	355	14H 26M 19.25S	27M 18.25S	59.00S	SHORT
3A172	DEC 21.73	355	14H 28M 16.75S	28M 26.25S	9.50S	SHORT
3A173	DEC 21.73	355	19H 18M 0.50S	18M 9.50S	9.00S	SHORT
3A174	DEC 21.73	355	21H 22M 9.75S	22M 19.25S	9.50S	SHORT
3A175	DEC 21.73	355	22H 41M 19.00S	41M 28.00S	9.00S	SHORT
3A176	DEC 22.73	356	0H 22M 44.50S	23M 3.75S	19.25S	SHORT
3A177	DEC 22.73	356	1H 18M 51.75S	19M 50.50S	58.75S	LONG
3A178	DEC 22.73	356	1H 20M 55.00S	21M 4.50S	9.50S	SHORT
3A179	DEC 22.73	356	13H 52M 4.25S	53M 3.75S	59.50S	LONG
3A180	DEC 22.73	356	13H 53M 32.25S	53M 51.75S	19.50S	SHORT
3A181	DEC 22.73	356	15H 20M 51.00S	21M 0.50S	9.50S	SHORT
3A182	DEC 22.73	356	17H 12M 44.25S	12M 53.50S	9.25S	SHORT
3A183	DEC 22.73	356	18H 27M 38.75S	27M 48.50S	9.75S	SHORT
3A184	DEC 22.73	356	20H 10M 27.50S	10M 37.00S	9.50S	SHORT
3A185	DEC 22.73	356	21H 33M 3.25S	33M 12.75S	9.50S	SHORT
3A186	DEC 22.73	356	23H 12M 38.75S	12M 47.50S	8.75S	SHORT
3A187	DEC 23.73	357	2H 15M 4.00S	16M 3.00S	59.00S	LONG
3A188	DEC 23.73	357	2H 16M 18.25S	16M 37.00S	18.75S	SHORT
3A189	DEC 23.73	357	13H 8M 22.50S	8M 23.75S	1.25S	SHORT
3A190	DEC 23.73	357	13H 14M 18.75S	15M 18.50S	59.75S	LONG
3A191	DEC 23.73	357	13H 17M 35.50S	17M 54.50S	19.00S	SHORT
3A192	DEC 23.73	357	16H 38M 26.25S	38M 36.00S	9.75S	SHORT
3A193	DEC 24.73	358	1H 45M 28.25S	46M 28.00S	59.75S	LONG
3A194	DEC 24.73	358	1H 47M 21.00S	47M 30.00S	9.00S	SHORT
3A195	DEC 24.73	358	14H 11M 46.00S	12M 45.25S	59.25S	LONG
3A196	DEC 24.73	358	14H 13M 18.00S	13M 37.25S	19.25S	SHORT
3A197	DEC 24.73	358	17H 26M 16.50S	26M 25.75S	9.25S	SHORT
3A198	DEC 24.73	358	17H 46M 52.75S	47M 11.75S	19.00S	SHORT
3A199	DEC 24.73	358	17H 48M 12.00S	49M 10.75S	58.75S	LONG
3A200	DEC 25.73	359	1H 14M 7.00S	15M 6.50S	59.50S	LONG

3A201	DEC 25.73	359	1H 15M 48.50S	16M 7.50S	19.00S	SHORT

4.0 ENGINEERING DATA BOOK - JSC

During all of the manned phases of the Skylab Program, NRL maintained a science console in the ATM Staff Support room at JSC. One of the duties of the NRL team member manning the science console was to record information in support of each frame of S082A and S082B film exposed by the astronauts or during unattended operations. Experiment log books for each camera were
Rev A used to record the time of each shutter opening (accurate to one minute of GMT), the day/night cycle number, the Joint Observing Program (JOP), step and building block number, the solar feature or target being studied, the exposure duration and wavelength and appropriate comments pertaining to individual frames as necessary.

At the conclusion of the Skylab Program, the experiment log books were compared frame by frame with engineering data compiled at JSC and MSFC, and with each instrument's internal diode array information. The results for this film camera are tabulated at the end of this section. Each column is labeled on the first
Rev A page of the tabulation. The FILM STRIP column is a permanently assigned frame number that identifies the mission and instrument as well as the sequence in which each frame was taken. All of the remaining columns were taken directly from the experiment log books and contain information in exactly the order described above. Comments from the experiment log books are recorded in Volume I of the NRL/ATM S082 Exposure Catalog (BBRC Document No. 620-249).

The glossary included in this section will identify all the abbreviations and symbols used as well as the name of each numbered JOP.

Rev A

MED Book Glossary

X represents a number assigned by the planning committee or by NOAA:

BSP	Bright Spot
BSX	Bright Spot and Number
CAL	Calibration, Target Unspecified
CHX	Coronal Hole and Number
EFR	Emerging Flux Region
ELB	East Limb
FXX	Filament and Number
JOP 1	Chromospheric Network
JOP 1A*	Near Sun Center (R < .5R.)
JOP 1A-1*	Step One of JOP 1A
JOP 2	Active Regions
JOP 3	Flares
JOP 4	Prominences
JOP 5	Limb Profile Studies
JOP 6	Synoptic Observations
JOP 7	Atmospheric Extinction
JOP 8	Coronal and Disk Transients
JOP 9	Solar Wind
JOP 10	Lunar Libration Clouds
JOP 11	Chromospheric Oscillations
JOP 12	Calibration
JOP 13	Night Sky Objects
JOP 14	Solar Eclipse
JOP 15	Coronal Holes
JOP 17	Bright Spot
JOP 18	Comet Kohoutek
JOP 19	Alfven Waves
JOP 20	Rapidly Changing Coronal Structure
JOP 21	Time Variations in Coronal Structure
JOP 24	Latitude Variation of Coronal Structure
JOP 25	S055 Maxi Roster

	JOP 26	Coronal and Chromospheric Structures
	JOP 27	Velocities
	K	Comet Kohoutek
	KC	Kohoutek Coma
	KN	Kohoutek Nucleus
	KT	Kohoutek Tail
	LBX	Limb and Number, 0 means 10
	LB	Limb
	LSX	Limb Scan and Number
	NCX	Network Cell and Number
	NP	North Pole
Rev A	OBS	Observing Time for Crew
	PXX	Prominence and Number
	QL	Quiet Limb
	QRX	Quiet Region and Number
	QR	Quiet Region
Rev A	S	Shopping List Designation
Rev A	SXX	Shopping List and Number
	SC	Sun Center
Rev A	SGL	Single Instrument Operation
	SP	South Pole
	UNA	Unattended
	UNK	Unknown
	VEL	Star Gamma Vel
	WLB	West Limb
	XX	Active Region Identifying Numbers, i.e. 00, 19, 27 etc.

* Sample - for specific JOP and step definitions, see JOP Summary Sheets.

Rev A

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BR	TGT	EXP	WVL
NOV 22	326:19:10	3A-001	97	EVA		UNK	:01	S
NOV 27	331:01:27	3A-002	163	06 -1	01A	SC	:59	L
NOV 27	331:01:29	3A-003	163	06 -1	01A	SC	:19	S
NOV 27	331:13:58	3A-004	171	06 -1	01A	SC	1:20	L
NOV 27	331:14:01	3A-005	171	06 -1	01A	SC	:20	S
NOV 28	332:14:44	3A-006	187	06 -1	01A	SC	:59	L
NOV 28	332:14:51	3A-007	187	06 -1	01A	SC	:19	S
NOV 28	332:17:51	3A-008	189	11 -2	10	87	1:00	L
NOV 28	332:17:58	3A-009	189	11 -2	18	87	1:00	L
NOV 28	332:18:00	3A-010	189	11 -2	18	87	:59	L
NOV 28	332:18:01	3A-011	189	11 -2	18	87	:59	L
NOV 28	332:18:03	3A-012	189	11 -2	18	87	:59	L
NOV 28	332:18:04	3A-013	189	11 -2	18	87	1:00	L
NOV 28	332:18:06	3A-014	189	11 -2	18	87	:59	L
NOV 28	332:18:07	3A-015	189	11 -2	18	87	1:00	L
NOV 28	332:18:09	3A-016	189	11 -2	18	87	1:00	L
NOV 28	332:18:11	3A-017	189	11 -2	18	87	:59	L
NOV 28	332:18:12	3A-018	189	11 -2	18	87	1:00	L
NOV 28	332:18:13	3A-019	189	11 -2	18	87	:59	L
NOV 28	332:18:15	3A-020	189	11 -2	18	87	1:00	L
NOV 28	332:18:16	3A-021	189	11 -2	18	87	:59	L
NOV 28	332:18:18	3A-022	189	11 -2	18	87	:59	L
NOV 28	332:18:19	3A-023	189	11 -2	18	87	:59	L
NOV 28	332:18:21	3A-024	189	11 -2	18	87	:59	L
NOV 28	332:18:22	3A-025	189	11 -2	18	87	:59	L
NOV 28	332:18:24	3A-026	189	11 -2	18	87	:59	L
NOV 28	332:18:27	3A-027	189	11 -2	18	87	:59	L
NOV 29	333:14:14	3A-028	202	06 -1	01A	SC	1:00	L
NOV 29	333:14:16	3A-029	202	06 -1	01A	SC	:19	S
NOV 29	333:17:10	3A-030	204	06 -2	02	SC	:09	S
NOV 30	334:14:54	3A-031	218	06 -1	01A	SC	:59	L
NOV 30	334:14:57	3A-032	218	06 -1	01A	SC	:19	S
DEC 1	335:01:46	3A-033	225	06 -1	01A	SC	:59	L
DEC 1	335:01:48	3A-034	225	06 -1	01A	SC	:20	S
DEC 1	335:15:50	3A-035	234	06 -1	01A	SC	1:00	L
DEC 1	335:15:53	3A-036	234	06 -1	01A	SC	:19	S
DEC 2	336:15:04	3A-037	249	06 -1	01A	SC	:59	L
DEC 2	336:15:06	3A-038	249	06 -1	01A	SC	:19	S
DEC 2	336:15:15	3A-039	249	03A	09	92	:44	S

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BR	TGT	EXP	WVL
DEC 2	336:15:16	3A-040	249	03A	09	92	:00.7	S
DEC 2	336:15:16	3A-041	249	03A	09	92	:02.5	S
DEC 2	336:15:16	3A-042	249	03A	09	92	:10	S
DEC 2	336:15:17	3A-043	249	03A	09	92	:40	S
DEC 2	336:15:17	3A-044	249	03A	09	92	:05	L
DEC 2	336:15:17	3A-045	249	03A	09	92	:09	L
DEC 3	337:12:53	3A-046	263	06 -1	01A	SC	1:00	L
DEC 3	337:12:55	3A-047	263	06 -1	01A	SC	:19	S
DEC 4	338:02:48	3A-048	272	08B	17	SC	:19	S
DEC 4	338:13:47	3A-049	279	06 -1	01A	SC	:59	L
DEC 4	338:13:49	3A-050	279	06 -1	01A	SC	:19	S
DEC 4	338:14:23	3A-051	279	06 -1	01A	SC	:59	L
DEC 4	338:14:26	3A-052	279	06 -1	01A	SC	:19	S
DEC 5	339:13:00	3A-053	294	06 -1	01A	SC	:59	L
DEC 5	339:13:03	3A-054	294	06 -1	01A	SC	:19	S
DEC 6	340:14:02	3A-055	310	06 -1	01A	SC	:59	L
DEC 6	340:14:05	3A-056	310	06 -1	01A	SC	:19	S
DEC 7	341:12:11	3A-057	324	06 -1	01A	SC	:59	L
DEC 7	341:20:55	3A-058	330	06 -2	02A	SC	:19	S
DEC 8	342:12:45	3A-059	340	06 -1	01A	SC	:59	L
DEC 8	342:12:48	3A-060	340	06 -1	01A	SC	:19	S
DEC 8	342:15:51	3A-061	342	11 -3	18	QR1	37:59	S
DEC 9	343:13:24	3A-062	356	06 -1	01A	SC	1:00	L
DEC 9	343:13:27	3A-063	356	06 -1	01A	SC	:19	S
DEC 10	344:15:47	3A-064	373	06 -1	01A	SC	1:02	L
DEC 10	344:15:48	3A-065	373	06 -1	01A	SC	:19	S
DEC 10	344:23:46	3A-066	378	12A-1	22	QR1	4:59	L
DEC 11	345:00:09	3A-067	378	12A-1	22	QR1	:29	L
DEC 11	345:00:10	3A-068	378	12A-1	22	QR1	:09	S
DEC 11	345:15:05	3A-069	388	06 -1	01A	SC	:59	L
DEC 11	345:15:06	3A-070	388	06 -1	01A	SC	:20	S
DEC 11	345:16:40	3A-071	389	15B-1	13	CH1	1:20	L
DEC 11	345:16:52	3A-072	389	15B-1	13	CH1	:39	S
DEC 11	345:18:12	3A-073	390	15B-1	13	CH1	5:20	L
DEC 11	345:18:19	3A-074	390	15B-1	13	CH1	2:39	S
DEC 12	346:16:00	3A-075	404	06 -1	01A	SC	1:00	L
DEC 12	346:16:02	3A-076	404	06 -1	01A	SC	:19	S
DEC 13	347:02:50	3A-077	411	06 -1	01A	SC	2:39	L
DEC 13	347:02:54	3A-078	411	06 -1	01A	SC	1:19	S

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BB	TGT	EXP	WVL
DEC 13	347:13:52	3A-079	418	06 -1	01A	SC	:59	L
DEC 13	347:13:53	3A-080	418	06 -1	01A	SC	:19	S
DEC 14	348:01:05	3A-081	425	06 -1	01B	SC	:39	S
DEC 14	348:01:06	3A-082	425	06 -1	01B	SC	2:39	L
DEC 14	348:14:36	3A-083	434	06 -1	01A	SC	:59	L
DEC 14	348:14:38	3A-084	434	06 -1	01A	SC	:19	S
DEC 14	348:21:33	3A-085	438	S04		LB	:43	S
DEC 15	349:01:28	3A-086	441	06 -1	01A	SC	1:00	L
DEC 15	349:01:29	3A-087	441	06 -1	01A	SC	:19	S
DEC 15	349:01:41	3A-088	441	06 -1	01B	SC	:19	S
DEC 15	349:01:41	3A-089	441	06 -1	01B	SC	1:00	L
DEC 15	349:13:57	3A-090	449	06 -1	01A	SC	:59	L
DEC 15	349:13:58	3A-091	449	06 -1	01A	SC	:19	S
DEC 16	350:02:19	3A-092	457	06 -1	01A	SC	2:39	L
DEC 16	350:02:22	3A-093	457	06 -1	01A	SC	1:19	S
DEC 16	350:13:14	3A-094	464	06 -1	01A	SC	:59	L
DEC 16	350:13:16	3A-095	464	06 -1	01A	SC	:19	S
DEC 16	350:13:54	3A-096	464	S	17	00	:40	S
DEC 16	350:19:36	3A-097	468	26 -2	10	00	:40	S
DEC 16	350:19:43	3A-098	468	26 -2	10	00	:59	L
DEC 16	350:20:09	3A-099	468	03A	09	00	:20	S
DEC 16	350:20:10	3A-100	468	03A	09	00	:02.5	S
DEC 16	350:20:10	3A-101	468	03A	09	00	:10	S
DEC 16	350:20:10	3A-102	468	03A	09	00	:40	S
DEC 16	350:20:11	3A-103	468	03A	09	00	:05	L
DEC 16	350:20:11	3A-104	468	03A	09	00	:20	L
DEC 16	350:20:11	3A-105	468	03A	09	00	1:20	L
DEC 16	350:20:12	3A-106	468	03A	09	00	:02.5	S
DEC 16	350:20:12	3A-107	468	03A	09	00	:10	S
DEC 16	350:20:13	3A-108	468	03A	09	00	:40	S
DEC 16	350:20:13	3A-109	468	03A	09	00	:10	S
DEC 16	350:20:14	3A-110	468	03A	09	00	:22	S
DEC 16	350:20:59	3A-111	469	19 -1	35	SC	:19	S
DEC 16	350:22:51	3A-112	470	19 -1	35	SC	:59	L
DEC 17	351:00:03	3A-113	471	19 -1	35	SC	:19	S
DEC 17	351:00:31	3A-114	471	03A	09	00	:14	S
DEC 17	351:00:33	3A-115	471	03A	09	00	:02.5	S
DEC 17	351:00:33	3A-116	471	03A	09	00	:10	S
DEC 17	351:00:33	3A-117	471	03A	09	00	:40	S

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BR	TGT	EXP	WVL
DEC 17	351:00:34	3A-118	471	03A	09	00	:05	L
DEC 17	351:00:34	3A-119	471	03A	09	00	:20	L
DEC 17	351:00:34	3A-120	471	03A	09	00	1:20	L
DEC 17	351:00:36	3A-121	471	03A	09	00	:02.5	S
DEC 17	351:00:36	3A-122	471	03A	09	00	:10	S
DEC 17	351:00:36	3A-123	471	03A	09	00	:40	S
DEC 17	351:00:37	3A-124	471	03A	09	00	:10	S
DEC 17	351:00:37	3A-125	471	03A	09	00	:40	S
DEC 17	351:00:37	3A-126	471	03A	09	00	2:39	S
DEC 17	351:00:40	3A-127	471	03A	09	00	:10	L
DEC 17	351:00:40	3A-128	471	03A	09	00	:40	L
DEC 17	351:00:41	3A-129	471	03A	09	00	2:39	L
DEC 17	351:00:44	3A-130	471	03A	09	00	:02.5	S
DEC 17	351:00:44	3A-131	471	03A	09	00	:10	S
DEC 17	351:00:44	3A-132	471	03A	09	00	:40	S
DEC 17	351:00:45	3A-133	471	03A	09	00	:10	S
DEC 17	351:00:45	3A-134	471	03A	09	00	:40	S
DEC 17	351:00:46	3A-135	471	03A	09	00	2:39	S
DEC 17	351:00:48	3A-136	471	03A	09	00	:10	L
DEC 17	351:00:48	3A-137	471	03A	09	00	:40	L
DEC 17	351:00:49	3A-138	471	03A	09	00	2:39	L
DEC 17	351:01:39	3A-139	472	03A	09	00	:19	S
DEC 17	351:01:49	3A-140	472	01A-1	01A	SC	:19	S
DEC 17	351:01:59	3A-141	472	01A-1	01A	SC	:58	S
DEC 17	351:02:11	3A-142	472	01B-1	01B	SC	:19	S
DEC 17	351:02:12	3A-143	472	01B-1	01B	SC	:59	L
DEC 17	351:15:37	3A-144	481	06 -1	01A	SC	:59	L
DEC 17	351:15:39	3A-145	481	06 -1	01A	SC	:20	S
DEC 17	351:23:26	3A-146	486	06 -2	28	SC	:19	S
DEC 18	352:13:24	3A-147	495	06 -1	01A	SC	:59	L
DEC 18	352:13:25	3A-148	495	06 -1	01A	SC	:20	S
DEC 19	353:06:32	3A-149	506	UNA		P59	:10	S
DEC 19	353:06:32	3A-150	506	UNA		P59	:20	L
DEC 19	353:06:32	3A-151	506	UNA		P59	:40	S
DEC 19	353:06:33	3A-152	506	UNA		P59	1:20	L
DEC 19	353:06:34	3A-153	506	UNA		P59	2:40	S
DEC 19	353:06:37	3A-154	506	UNA		P59	5:19	L
DEC 19	353:12:59	3A-155	510	26 -2	10	P59	1:59	L
DEC 19	353:13:08	3A-156	510	26 -2	10	P59	:40	S

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BB	TGT	EXP	WVL
DEC 19	353:14:19	3A-157	511	06 -1	01A	SC	1:00	L
DEC 19	353:14:21	3A-158	511	06 -1	01A	SC	:20	S
DEC 19	353:19:38	3A-159	514	02B-5	10	04	:19	S
DEC 19	353:20:27	3A-160	515	OBS		UNK	:19	S
DEC 19	353:20:40	3A-161	515	02B-5	10	04	:19	S
DEC 20	354:13:34	3A-162	526	06 -1	01A	SC	1:00	L
DEC 20	354:13:36	3A-163	526	06 -1	01A	SC	:20	S
DEC 20	354:15:18	3A-164	527	01D-1	28	LB3	:19	S
DEC 20	354:16:57	3A-165	528	OBS		SC	:20	S
DEC 20	354:20:02	3A-166	530	02A-3	36	00	:20	S
DEC 20	354:22:53	3A-167	532	03A	09	SC	:13	S
DEC 21	355:02:21	3A-168	534	06 -1	01A	SC	:59	L
DEC 21	355:02:23	3A-169	534	06 -1	01A	SC	:19	S
DEC 21	355:12:55	3A-170	541	OBS		SC	:09	S
DEC 21	355:14:26	3A-171	542	06 -1	01A	SC	:59	S
DEC 21	355:14:28	3A-172	542	06 -1	01A	SC	:10	S
DEC 21	355:19:18	3A-173	545	OBS		SC	:09	S
DEC 21	355:21:22	3A-174	546	02A-1	04	00	:09	S
DEC 21	355:22:41	3A-175	547	02A-3	36	00	:09	S
DEC 22	356:00:22	3A-176	548	S10		UNK	:19	S
DEC 22	356:01:18	3A-177	549	06 -1	01A	SC	:59	L
DEC 22	356:01:20	3A-178	549	06 -1	01A	SC	:10	S
DEC 22	356:13:52	3A-179	557	06 -1	01A	SC	1:00	L
DEC 22	356:13:53	3A-180	557	06 -1	01A	SC	:20	S
DEC 22	356:15:20	3A-181	558	SGL		SC	:10	S
DEC 22	356:17:12	3A-182	559	SGL		SC	:09	S
DEC 22	356:18:27	3A-183	560	SGL		SC	:10	S
DEC 22	356:20:10	3A-184	561	SGL		SC	:10	S
DEC 22	356:21:33	3A-185	562	SGL		SC	:10	S
DEC 22	356:23:12	3A-186	563	SGL		SC	:09	S
DEC 23	357:02:15	3A-187	565	06 -1	01A	SC	:59	L
DEC 23	357:02:16	3A-188	565	06 -1	01A	SC	:19	S
DEC 23	357:13:08	3A-189	572	SGL		SC	:01.5	S
DEC 23	357:13:14	3A-190	572	06 -1	01A	SC	1:00	L
DEC 23	357:13:17	3A-191	572	06 -1	01A	SC	:19	S
>DEC 23	357:16:38	3A-192	574	SGL		SC	:10	S
DEC 24	358:01:45	3A-193	580	06 -1	01A	SC	1:00	L
DEC 24	358:01:47	3A-194	580	06 -1	01A	SC	:09	S
DEC 24	358:14:11	3A-195	588	06 -1	01A	SC	:59	L

DATE	TIME	FILM-STRIP	D/N	JOP-ST	BR	TGT	EXP	WVL
DEC 24	358:14:13	3A-196	588	06 -1	01A	SC	:19	S
DEC 24	358:17:26	3A-197	590	SGL		SC	:09	S
DEC 24	358:17:46	3A-198	590	14 -7	31	SC	:19	S
DEC 24	358:17:48	3A-199	590	14 -7	31	SC	:59	L
DEC 25	359:01:14	3A-200	595	06 -1	01A	SC	1:00	L
DEC 25	359:01:15	3A-201	595	06 -1	01A	SC	:19	S

TEMPERATURE DATA—MSFC

5.0 ENGINEERING DATA BOOK - MSFC

This portion of the Mission Engineering Data Book was originated at MSFC from the telemetered data during the Skylab Missions. The shutter open and shutter close times were GMT corrected and superimposed on this data and the exposure time was computed from these times. In addition, all other ATM instruments operating
Rev A while S082A was recording scientific data are noted.
Also included are pointing information and certain selected orbital or ephemeris data. This data is in the form of a computer printout and is recorded on magnetic tape.

The telemetry system was noisy during the mission and often data was missing from the printouts (dropouts). The telemetry noise caused many false exposure data to appear on the telemetry, while the dropouts caused exposure data lines to be missing. Consequently it was necessary to correct these engineering data using several other sources of information through time correlation.

The corrected EDB (MSFC) has been coordinated with data from the diode array, MSFC quick look data (AUTO SCAN), MSFC and JSC console logs, MSFC Data Book Six, and the JSC EDB. The corrected roll information as provided by IBM under contract with MSFC has been incorporated into the computer tabulations.

Rev A The initial IBM issue of these reconstructed values was based on 1950 Ephemeris Data. Additional information provided by IBM updated these values to the 1973 Ephemeris Data. These delta corrections have been incorporated into the computer tabulations. The roll values contained in this book are accurate to within 3 arc minutes of the IBM values.

Rev A

S082A EDB PRINTOUT INDEX

OPEN	Complete Greenwich Mean-time when shutter was opened (Column A).
CLOSE	Greenwich Mean-time in minutes, seconds, and milliseconds when shutter was closed (Column B).
EXPOSURE TIME	Difference between shutter OPEN and CLOSE time (Column C).
FRAME COUNT	The film strip number as assigned by NRL (Column D).
WVL	Wavelength - 'G' is grating position and 'M' is the mirror position. 'S' is printed in both columns for Short Wavelength, and 'L' is Long Wavelength (Columns E and F).
MULT	Multiplier - '1' is normal exposure time, '1/4' is normal exposure time divided by four, and '4' is normal exposure time multiplied by four (Column G).
MODE	Operating Mode of Instrument - 'AUTO 1' is Auto 1 Mode, 'AUTO 2' is Auto 2 Mode, 'FLARE' is Flare Mode, and 'MAN' is Manual or Time Mode (Column H).
OP EXP	Operating Experiments - A number in the respective columns indicates the experiment was operating while the shutter was OPEN, 'X' indicates the Instrument assigned to that column was not operating. The columns are assigned as follows: Col I is S-052; Col J is S-054; Col K is S-055; Col L contains operating modes of the S-055 experiments, 'ML' is Line Mirror Mode, 'M3' is 3 Raster Mirror Mode, 'MA' is Auto Mirror Mode; 'GA' is Grating Advance Single Step Mode, 'GS' is Grating Scan Mode, 'G3' is 3 Grating Scan Modes, 'GR' is Grating Reference Mode, a void indicates no mode, BT23 indicates mode unknown; Col M is S-056; Col N is S082B; and Col O is Hα 1.

S082A EDB PRINTOUT INDEX
Page 2

TEMP	Temperature of Instrument - Provide quick check of instrument temperatures when shutter was opened (OP-Column P) and closed (CL-Column Q). 'OK' is printed in the 'OP' column when: 1) the absolute temperatures of the instrument are 70 ± 13°F; 2) the absolute temperature of the grating is 73 ± 10°F; and 3) the differential temperatures are 0 ± 5°F. If any of the temperatures are not within the above described limits, an 'X' is printed in the 'OP' column. If the above measured temperatures vary during the time the shutter was OPEN by less than 1) ±5.4°F for all absolute temperatures, 2) ±6.6°F for the grating, 3) ±0.2°F for the vertical differential temperatures, and 4) ±0.5°F for horizontal differential temperatures, 'OK' is printed in the TEMP 'CL' Column. If these requirements are not met, 'X' is printed in the TEMP 'CL' Column.
ROLL	GAMRR - Roll position is printed in Column R.
MAX PT. EXC.	Maximum Pointing Excursion - The maximum deviation of the Point Control during the shutter OPEN period is printed in these three columns. GAMX, GAMY and GAMRR Point Positions are printed in the respective columns, S, T and U.
NRL BIAS	The alignment bias values for the S082B instrument are printed at S082A shutter OPEN and CLOSE.

S082A EDB PRINTOUT INDEX
Page 3

ANGLE	'B' (Column V) is the minimum angle (β, Fig. 5-1) from sun-earth line to Skylab orbital plane, and 'E' (Column W) is the minimum angle (α, Fig. 5-2) between Skylab-sun line and nearest forward earth horizon as measured in the vertical plane. Both angles were printed when shutter opened.
ALTITUDE	The altitude (A, Fig. 5-2) of the Skylab in kilometers when shutter was opened (Column X).
Zm	The distance of the viewing line above earth (Zm, Fig. 5-2) in kilometers when the shutter was opened (Column Y). $Z_M = (6378 + A)$ cosine E - 6378 where E is from Column 'W' and A is from Column 'X'. NOTE: Zm is meaningful only for values E between 0 and -1290 arc minutes.
ORBIT NO.	Orbit number (Column Z).

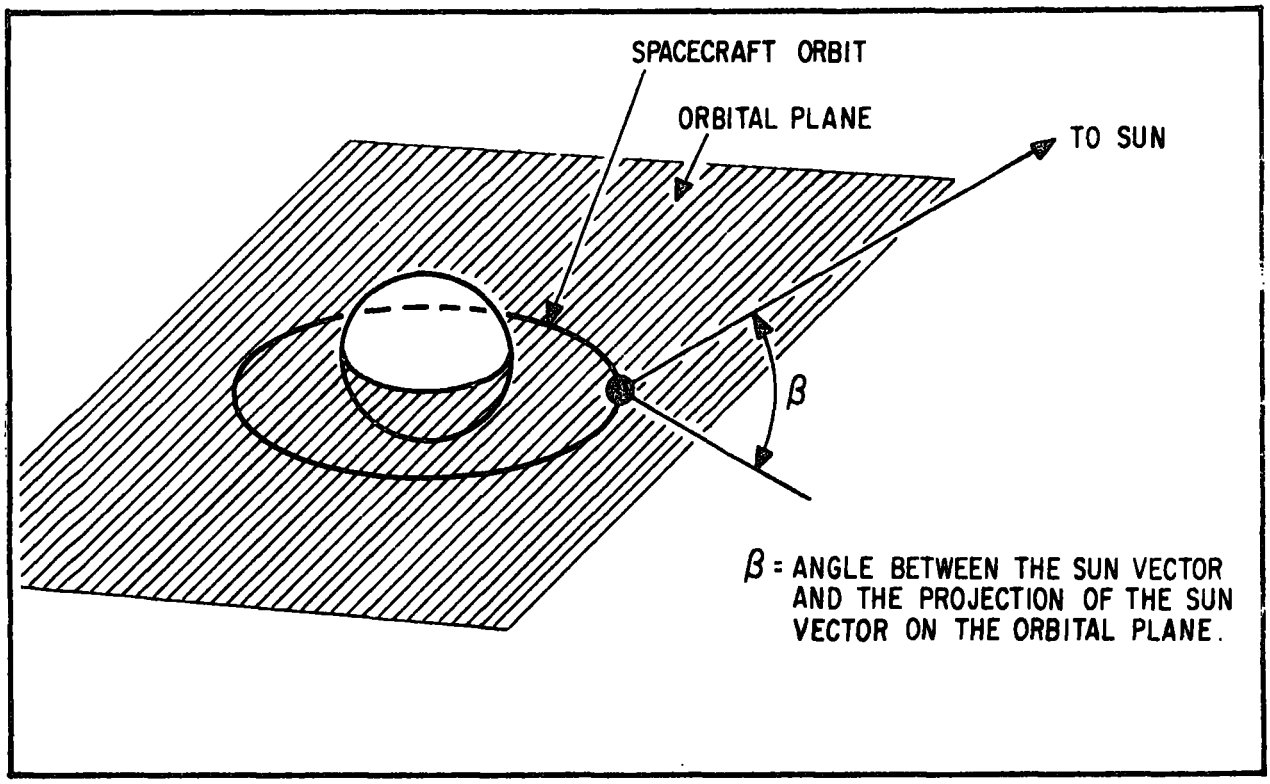


Figure 5-1 Beta Angle

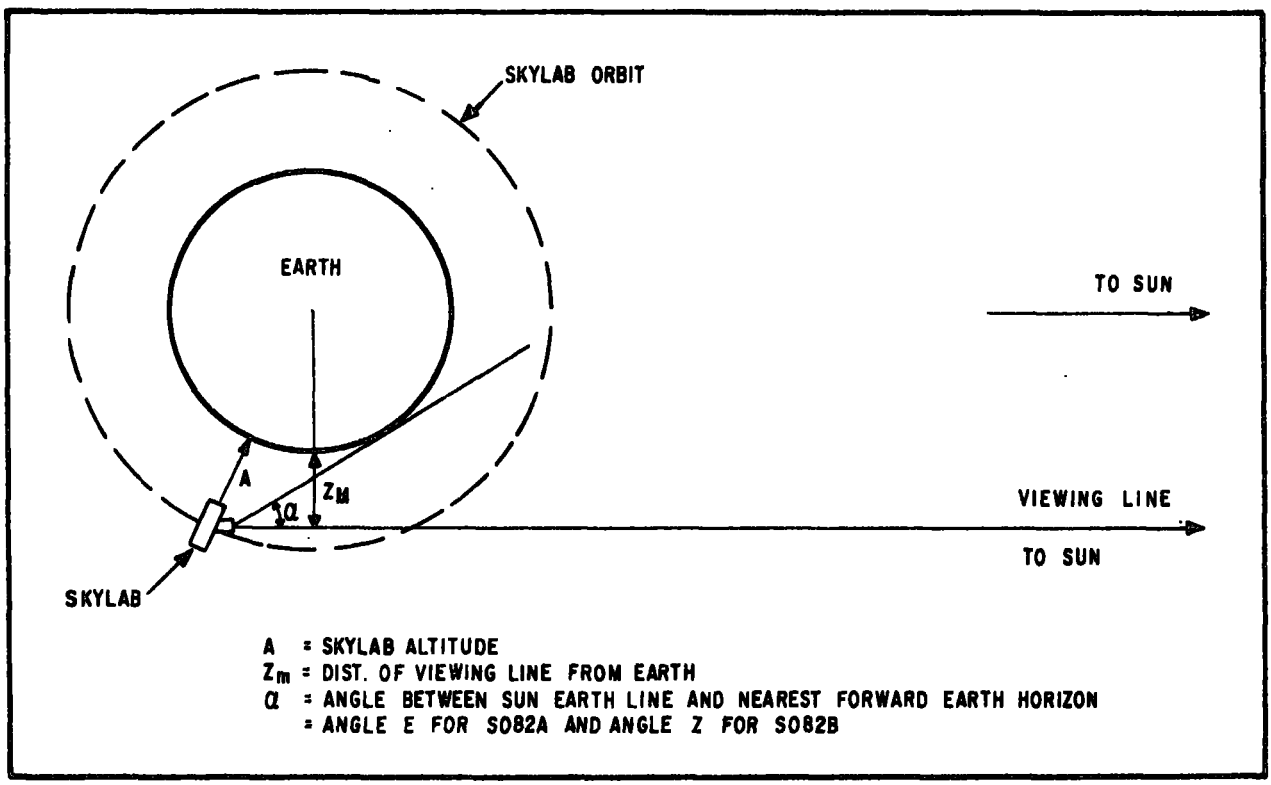


Figure 5-2 Extinction Parameters

S082A-ED8
INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	(G)	MULT (H)	MODE (I)	(J)	(K)	OP EXP (L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
326:19:10:52:250	10:53:583	0: 1:333	3A-001	S	S	I	MAN	X	X	5		X	X	X	OK	OK
331: 1:27:31:308	28:30:308	0:59: 0	3A-002	L	L	I	MAN	X	4	5	MA	6	X	HI	OK	OK
331: 1:29:30: 58	29:49:308	0:19:250	3A-003	S	S	I	MAN	X	4	5	MA	6	X	HI	OK	OK
331:13:58:52:602	0:13:182	1:20:580	3A-004	L	L	I	MAN	X	X	5	GS	6	X	HI	OK	OK
331:14: 1: 2:908	1:22:929	0:20: 21	3A-005	S	S	I	MAN	X	X	5	MA	6	X	HI	OK	OK
332:14:44:57:500	45:56:750	0:59:250	3A-006	L	L	I	MAN	X	X	5	MA	6	X	HI	OK	OK
332:14:51: 7:597	51:26:513	0:18:916	3A-007	S	S	I	MAN	X	X	5	MA	6	X	HI	OK	OK
332:17:51:32:208	52:31:958	0:59:750	3A-008	L	L	I	MAN	X	X	5	MA	6	X	HI	OK	OK
332:17:58:55: 92	59:55:175	1: 0: 83	3A-009	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 0:23:757	1:23:421	0:59:664	3A-010	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 1:55: 3	2:53:915	0:58:912	3A-011	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 3:25:162	4:23:909	0:58:747	3A-012	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 4:55:324	5:54:904	0:59:580	3A-013	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 6:24:985	7:23:901	0:58:916	3A-014	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 7:55:400	8:54:898	0:59:498	3A-015	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18: 9:25:230	10:24:895	0:59:665	3A-016	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:11: 0:145	11:59:958	0:59:813	3A-017	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:12:26:708	13:25:958	0:59:250	3A-018	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:13:55:208	14:54:958	0:59:750	3A-019	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:15:24:958	16:23:958	0:59: 0	3A-020	L	L	I	MAN	X	X	5	ML	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) GXBI	GYBI	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-001	8980.00				-18.75	53.75	-3900.00	1440.00	439.70	428.00	2777
		.000	.000	.000	-18.75	53.75					
3A-002	-10796.00				-18.75	53.75	-2889.69	183.00	438.39	428.83	2836
		.000	.000	.000	-18.75	53.75					
3A-003	-10796.00				-18.75	53.75	-2890.00	489.00	440.10	277.30	2836
		.000	.000	.000	-18.75	53.75					
3A-004	-10787.47				-18.75	53.75	-2747.94	976.78	441.78	421.16	2844
		.000	.000	2.160	-18.75	53.75					
3A-005	-10788.00				-18.75	53.75	-2747.06	1423.73	442.76	433.60	2844
		.000	.000	1.480	-18.75	53.75					
3A-006	-10798.00				-18.75	53.75	-2466.14	39.89	437.98	437.52	2859
		.000	.000	.990	-18.75	53.75					
3A-007	-10798.00				-18.75	53.75	-2463.81	1236.47	441.82	441.81	2859
		.000	.000	.990	-18.75	53.75					
3A-008	-10797.00				-18.75	53.75	-2430.30	131.44	438.42	87.27	2860
		.000	.000	.000	-18.75	53.75					
3A-009	-10797.00				-18.75	53.75	-2428.00	1334.07	441.92	439.60	2860
		.000	.000	1.550	-18.75	53.75					
3A-010	-10797.00				-18.75	53.75	-2430.00	1660.00	442.30	393.50	2861
		2.500	.000	.000	-18.75	53.75					
3A-011	-10797.00				-18.75	53.75	-2430.00	1810.00	442.40	350.00	2861
		.000	.000	.990	-18.75	53.75					
3A-012	-10797.00				-18.75	53.75	-2430.00	2110.00	442.60	229.90	2861
		.000	.000	.990	-18.75	53.75					
3A-013	-10797.00				-18.75	53.75	-2430.00	2240.00	442.60	157.20	2861
		.000	.000	.990	-18.75	53.75					
3A-014	-10797.00				-18.75	53.75	-2430.00	2490.00	442.70	-1.70	2861
		.000	.000	.990	-18.75	53.75					
3A-015	-10797.00				-18.75	53.75	-2430.00	2600.00	442.70	-82.40	2861
		.000	.000	1.320	-18.75	53.75					
3A-016	-10797.00				-18.75	53.75	-2430.00	2790.00	442.90	-231.00	2861
		.000	.000	.990	-18.75	53.75					
3A-017	-10797.00				-18.75	53.75	-2430.00	2910.00	443.10	-342.40	2861
		.000	.000	.990	-18.75	53.75					
3A-018	-10797.00				-18.75	53.75	-2430.00	2950.00	443.30	-377.30	2861
		.000	.000	.000	-18.75	53.75					
3A-019	-10797.00				-18.75	53.75	-2430.00	2970.00	443.60	-395.80	2861
		.000	.000	.000	-18.75	53.75					
3A-020	-10797.00				-18.75	53.75	-2430.00	2960.00	444.20	-380.50	2861
		.000	.000	.990	-18.75	53.75					

5082A-EDB
INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	(G)	MULT (H)	MODE (I)	OP EXP (J)	(K)	(L)	(M)	(N)	TEMP (O)	TEMP OP (P)	TEMP CL (Q)
332:18:16:54:958	17:53:958	0:59: 0	3A-021	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:18:25:208	19:23:958	0:58:750	3A-022	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:19:55:458	20:54:958	0:59:500	3A-023	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:21:25: 33	22:23:862	0:58:829	3A-024	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:22:54:777	23:53:858	0:59: 81	3A-025	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:24:24:939	25:23:853	0:58:914	3A-026	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
332:18:27:23:458	28:22:958	0:59:500	3A-027	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
333:14:14:25:350	15:25: 95	0:59:745	3A-028	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
333:14:16:17:926	16:37: 91	0:19:165	3A-029	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
333:17:10:31:508	10:40:758	0: 9:250	3A-030	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
334:14:54:49:240	55:48:308	0:58:985	3A-031	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
334:14:57: 8:308	57:27:308	0:19: 0	3A-032	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
335: 1:46:32:359	47:31:609	0:59:250	3A-033	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
335: 1:48:29:859	48:49:609	0:19:750	3A-034	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
335:15:50:10:920	51:10:500	0:59:580	3A-035	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
335:15:53:12:658	53:31:491	0:18:833	3A-036	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
336:15: 4: 8:717	5: 8:132	0:59:415	3A-037	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
336:15: 6:38:128	6:57:127	0:18:999	3A-038	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
336:15:15:39:434	16:24:267	0:44:833	3A-039	S	S	1	MAN	X	4	5	GJ	6	X	HI	OK	OK
336:15:16:39:350	16:39:183	0: 0:833	3A-040	S	S	1	MAN	X	4	5	ML	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) G^{XBI}	G^{YBI}	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-021	-10797.00				-18.75	53.75	-2430.00	2920.00	444.60	-347.50	2861
		.000	.000	.000	-18.75	53.75					
3A-022	-10797.00				-18.75	53.75	-2430.00	2800.00	445.50	-238.80	2861
		.000	.000	.000	-18.75	53.75					
3A-023	-10797.00				-18.75	53.75	-2430.00	2720.00	446.00	168.20	2861
		.000	.000	.000	-18.75	53.75					
3A-024	-10797.00				-18.75	53.75	-2430.00	2520.00	447.10	-9.60	2861
		.000	.000	.000	-18.75	53.75					
3A-025	-10797.00				-18.75	53.75	-2430.00	2400.00	447.70	72.20	2861
		.000	.000	.000	-18.75	53.75					
3A-026	-10797.00				-18.75	53.75	-2430.00	2130.00	448.80	226.10	2861
		.000	.000	.000	-18.75	53.75					
3A-027	-10797.00				-18.75	53.75	-2420.00	1690.00	450.30	396.30	2861
		.000	.000	.990	-18.75	53.75					
3A-028	-10796.81				-18.75	53.75	-2190.00	2070.00	442.09	246.13	2873
		.000	.000	.330	-18.75	53.75					
3A-029	-10797.00				-18.75	53.75	-2190.00	2380.00	442.15	74.78	2873
		.000	.000	.000	-18.75	53.75					
3A-030	-5387.00				-18.75	53.75	-2157.63	220.00	438.80	141.14	2874
		.000	.000	.000	-18.75	53.75					
3A-031	-5393.00				-18.75	53.75	-1910.00	143.00	437.80	94.70	2887
		.000	.000	.660	-18.75	53.75					
3A-032	-5393.00				-18.75	53.75	-1910.00	571.00	439.50	311.00	2887
		.000	.000	.000	-18.75	53.75					
3A-033	-10783.00				-18.75	53.75	-1780.00	-33.50	437.40	437.08	2894
		.000	.000	.000	-18.75	53.75					
3A-034	-10783.00				-18.75	53.75	-1780.00	265.00	438.70	164.10	2894
		.000	.000	.000	-18.75	53.75					
3A-035	-10792.00				-18.75	53.75	-1620.00	871.00	439.60	400.00	2902
		.000	.000	1.320	-18.75	53.75					
3A-036	-10792.00				-18.75	53.75	-1620.00	1480.00	440.40	424.00	2902
		.000	.000	.330	-18.75	53.75					
3A-037	-10797.81				-18.75	53.75	-1355.42	-35.98	437.29	436.92	2916
		.000	.000	.330	-18.75	53.75					
3A-038	-10797.48				-18.75	53.75	-1354.74	391.06	438.25	231.73	2916
		.000	.000	.330	-18.75	53.75					
3A-039	-5395.58				-18.75	53.75	-1352.34	2279.00	440.42	132.76	2917
		.000	.000	.000	-18.75	53.75					
3A-040	-5395.58				-18.75	53.75	-1352.18	2480.03	440.60	3.61	2917
		.000	.000	.000	-18.75	53.75					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
336:15:16:53:599	16:56: 99	0: 2:500	3A-041	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
336:15:16:58: 99	17: 8: 16	0: 9:917	3A-042	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
336:15:17:10: 15	17:49:844	0:39:829	3A-043	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
336:15:17:51:844	17:56:761	0: 4:917	3A-044	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
336:15:17:58:761	18: 7:594	0: 8:833	3A-045	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
337:12:53: 2:274	54: 1:854	0:59:580	3A-046	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
337:12:55:20:685	55:39:852	0:19:167	3A-047	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
338: 2:46:36:359	48:55:609	0:19:250	3A-048	S	S	1	MAN	X	X	5	ML	6	X	HI	OK	OK
338:13:47: 5:557	48: 4:721	0:59:164	3A-049	L	L	1	MAN	X	4	5	GS	6	X	HI	OK	OK
338:13:49:45:384	50: 4:712	0:19:328	3A-050	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
338:14:23: 1:358	24: 0:858	0:59:500	3A-051	L	L	1	MAN	X	4	5		6	X	HI	OK	OK
338:14:26:37:858	26:56:858	0:19: 0	3A-052	S	S	1	MAN	X	4	5		6	X	HI	OK	OK
339:13: 0: 8:955	1: 8:118	0:59:163	3A-053	L	L	1	MAN	X	4	5		6	X	HI	OK	OK
339:13: 3: 2:946	3:22:112	0:19:166	3A-054	S	S	1	MAN	X	4	5		6	X	HI	OK	OK
340:14: 2:47:758	3:47: 8	0:59:250	3A-055	L	L	1	MAN	2	4	5	GS	6	X	HI	OK	OK
340:14: 5:14:508	5:34: 8	0:19:500	3A-056	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
341:12:11:27:108	12:26:108	0:59: 0	3A-057	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
341:20:55:16:608	55:35:858	0:19:250	3A-058	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
342:12:45:27:505	46:26:251	0:58:746	3A-059	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
342:12:48:14:913	48:34:246	0:19:333	3A-060	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMKR	-NRL BIAS- (ARCSEC) GXB1	GYB1	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-041	-5395.58				-18.75	53.75	-1352.18	2480.03	440.60	3.61	2917
		.000	.000	.000	-18.75	53.75					
3A-042	-5395.58				-18.75	53.75	-1352.18	2480.03	440.60	3.61	2917
		.000	.000	.000	-18.75	53.75					
3A-043	-5395.58				-18.75	53.75	-1352.03	2677.53	440.80	-144.43	2917
		.000	.000	.000	-18.75	53.75					
3A-044	-5395.58				-18.75	53.75	-1352.03	2677.53	440.80	-144.43	2917
		.000	.000	.000	-18.75	53.75					
3A-045	-5395.58				-18.75	53.75	-1352.03	2677.53	440.80	-144.43	2917
		.000	.000	.000	-18.75	53.75					
3A-046	10793.00				-18.75	53.75	-1107.19	804.66	438.53	383.99	2930
		.000	.000	.330	-18.75	53.75					
3A-047	10793.00				-18.75	53.75	-1106.61	1241.54	439.05	439.05	2930
		.000	.000	.000	-18.75	53.75					
3A-048	-5405.50				-18.75	53.75	-951.70	55.91	436.75	38.19	2938
		.000	.000	.000	-18.75	53.75					
3A-049	-5400.88				-18.75	53.75	-828.73	1362.41	438.53	-89.81	2945
		.000	.000	.000	-18.75	53.75					
3A-050	-5400.88				-18.75	53.75	-828.27	1809.12	438.96	345.89	2945
		.000	.000	.000	-18.75	53.75					
3A-051	-10797.47				-18.75	53.75	-823.65	1039.65	453.84	439.80	2945
		.000	.000	.000	-18.75	53.75					
3A-052	-10797.47				-18.75	53.75	-822.62	369.46	451.25	225.06	2945
		.000	.000	.000	-18.75	53.75					
3A-053	-10771.00				-18.75	53.75	-575.00	158.00	436.60	103.60	2959
		.000	.000	.000	-18.75	53.75					
3A-054	-10768.00				-18.75	53.75	-573.00	843.00	437.40	392.40	2959
		.000	.000	.000	-18.75	53.75					
3A-055	-10778.00				-18.75	53.75	-307.00	2740.10	439.30	-150.10	2974
		.000	.000	.000	-18.75	53.75					
3A-056	-10778.00				-18.75	53.75	-306.90	3301.20	440.70	-150.10	2974
		.000	.000	.000	-18.75	53.75					
3A-057	-10801.00				-18.75	53.75	-79.98	2619.90	456.80	-150.10	2987
		.000	.000	.000	-18.75	53.75					
3A-058	-10799.00				-18.75	53.75	9.73	-49.20	435.00	434.30	2992
		.000	.000	.660	-18.75	53.75					
3A-059	-10800.00				-18.75	53.75	166.00	4100.00	444.30	-1773.00	3002
		.000	.000	2.160	-18.75	53.75					
3A-060	-10800.00				-18.75	53.75	166.00	4780.00	447.40	-2846.00	3002
		.000	.000	.000	-18.75	53.75					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
342:15:51: 5:408	21: 4:908	37:59:500	3A-061	S	S	1	MAN	2	4	5	ML	6	X	HI	OK	OK
343:13:24: 2:602	25: 2:350	0:59:748	3A-062	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
343:13:27:16: 96	27:35:346	0:19:250	3A-063	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
344:15:47: 6:264	48: 8: 11	1: 1:747	3A-064	L	L	1	MAN	2	4	5	ML	6	X	HI	OK	OK
344:15:46:30:595	48:49:844	0:19:249	3A-065	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
344:23:46: 3:658	51: 2:385	4:58:727	3A-066	L	L	1	MAN	2	X	5	MA	6	X	HI	OK	OK
345: 0: 9:46:409	10:15:659	0:29:250	3A-067	L	L	1	MAN	X	X	5		6	X	HI	OK	OK
345: 0:10:36:659	10:45:659	0: 9: 0	3A-068	S	S	1	MAN	X	X	5		6	X	HI	OK	OK
345:15: 5:28:855	6:28:104	0:59:249	3A-069	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
345:15: 6:52:603	7:12:186	0:19:583	3A-070	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
345:16:40:23: 8	41:42:758	1:19:750	3A-071	L	L	1	MAN	X	X	5	GS	6	B	HI	OK	OK
345:16:52: 5:508	52:44:758	0:39:250	3A-072	S	S	1	MAN	X	X	5	M3	6	B	HI	OK	OK
345:18:12: 0:988	17:20:643	5:19:655	3A-073	L	L	1	MAN	X	X	5	M3	6	B	HI	OK	OK
345:18:19:36:757	22:15:507	2:38:750	3A-074	S	S	1	MAN	X	X	5	M3	6	B	HI	OK	OK
346:16: 0: 3:808	1: 3:558	0:59:750	3A-075	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
346:16: 2: 8: 58	2:27:558	0:19:500	3A-076	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
347: 2:50:39:859	53:19:359	2:39:500	3A-077	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
347: 2:54: 0:609	55:19:359	1:18:750	3A-078	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
347:13:52:15:608	53:14:858	0:59:250	3A-079	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
347:13:53:48:608	54: 7:858	0:19:250	3A-080	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) GXBI	GYBI	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-061	-10796.00				-18.75	53.75	196.00	3880.00	443.50	-1456.00	3004
		.000	.000	5.270	-18.75	53.75					
3A-062	-10799.00				-18.75	53.75	401.00	1040.00	435.50	423.90	3017
		.000	.000	.990	-18.75	53.75					
3A-063	-10799.00				-18.75	53.75	401.00	1730.00	436.70	368.10	3017
		.000	.000	.000	-18.75	53.75					
3A-064	-10800.00				-31.25	50.00	636.00	564.00	434.40	305.40	3032
		.000	.000	.000	-31.25	50.00					
3A-065	-10800.00				-31.25	50.00	636.00	792.00	434.80	378.40	3032
		.000	.000	.000	-31.25	50.00					
3A-066	-5384.00				-31.25	50.00	703.00	3430.00	443.60	-884.00	3037
		.000	.000	1.320	-31.25	50.00					
3A-067	-10788.00				-31.25	50.00	705.25	1905.70	455.73	-567.66	3037
		.000	.000	.000	-31.25	50.00					
3A-068	-10788.00				-31.25	50.00	705.55	1682.20	454.74	403.59	3037
		.000	.000	.990	-31.25	50.00					
3A-069	-10794.00				-31.25	50.00	828.00	421.00	433.80	244.60	3046
		.000	.000	.660	-31.25	50.00					
3A-070	-10794.00				-31.25	50.00	828.00	647.00	434.20	335.00	3046
		.000	.000	.660	-31.25	50.00					
3A-071	-5393.00				-31.25	50.00	841.00	816.00	434.50	384.20	3047
		.000	.000	.330	-31.25	50.00					
3A-072	-5393.00				-31.25	50.00	842.00	3450.00	444.80	-909.20	3047
		.000	.000	.000	-31.25	50.00					
3A-073	-5387.00				-31.25	50.00	853.00	536.00	434.00	294.20	3048
		.000	.000	.000	-31.25	50.00					
3A-074	-5387.00				-31.25	50.00	854.00	2100.00	438.20	225.20	3048
		.000	.000	.000	-31.25	50.00					
3A-075	-9.00				61.25	31.25	1020.00	1100.00	436.00	430.70	3061
		.000	.000	.330	61.25	31.25					
3A-076	-9.00				61.25	31.25	1020.00	1540.00	437.50	411.00	3061
		.000	.000	.000	61.25	31.25					
3A-077	16.00				61.25	31.25	1090.97	474.90	434.18	369.28	3068
		.000	.000	.330	61.25	31.25					
3A-078	16.00				61.25	31.25	1091.46	1353.04	436.83	432.98	3068
		.000	.000	.330	61.25	31.25					
3A-079	3.00				61.25	31.25	1160.00	2450.00	442.40	30.78	3075
		.000	.000	.330	61.25	31.25					
3A-080	3.00				61.25	31.25	1160.00	2650.00	443.70	-118.50	3075
		.000	.000	.000	61.25	31.25					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	TEMP (O)	TEMP OP (P)	TEMP CL (Q)
348: 1: 5:20:708	6: 0:208	0:39:500	3A-081	S	S	1	MAN	X	4	5	G3	6	X	HI	OK	OK
348: 1: 6:32:708	9:12:208	2:39:500	3A-082	L	L	1	MAN	X	4	5	G3	6	X	HI	OK	OK
348:14:36: 3:958	37: 3:208	0:59:250	3A-083	L	L	1	MAN	2	4	5		6	X	HI	OK	OK
348:14:38:29:708	38:48:958	0:19:250	3A-084	S	S	1	MAN	2	4	5		6	X	HI	OK	OK
348:21:33:46:507	34:29: 7	0:42:500	3A-085	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
349: 1:26:14:758	29:14:508	0:59:750	3A-086	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
349: 1:29:44:258	30: 3:508	0:19:250	3A-087	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
349: 1:41: 3: 41	41:22:290	0:19:249	3A-088	S	S	1	MAN	X	4	5	G3	6	X	HI	OK	OK
349: 1:41:37:872	42:37:287	0:59:415	3A-089	L	L	1	MAN	X	4	5	G3	6	X	HI	OK	OK
349:13:57: 2: 58	58: 1: 58	0:59: 0	3A-090	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
349:13:58:20: 58	58:39: 58	0:19: 0	3A-091	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
350: 2:19:31:359	22:10:609	2:39:250	3A-092	L	L	1	MAN	X	4	5	G3	6	X	HI	OK	OK
350: 2:22:39:609	23:58:609	1:19: 0	3A-093	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
350:13:14: 6: 0	15:15: 0	0:59: 0	3A-094	L	L	1	MAN	2	X	5	ML	6	X	HI	OK	OK
350:13:16:28: 0	16:47: 0	0:19: 0	3A-095	S	S	1	MAN	2	X	5	ML	6	X	HI	OK	OK
350:13:54:43:358	55:23:358	0:40: 0	3A-096	S	S	1	MAN	2	X	5	ML	6	X	HI	OK	OK
350:19:36:32:908	37:12:408	0:39:500	3A-097	S	S	1	MAN	X	X	5	MA	6	B	HI	OK	OK
350:19:43:11:658	44:11:158	0:59:500	3A-098	L	L	1	MAN	X	X	5	GS	6	B	HI	OK	OK
350:20: 9: 8:542	9:28:542	0:20: 0	3A-099	S	S	1	MAN	X	4	5		6	X	HI	OK	OK
350:20:10: 4:706	10: 7:206	0: 2:500	3A-100	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) GXB1	GYB1	ANGLE (ARCMINS) -R- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-081	-5388.00				61.25	31.25	1229.14	3187.48	460.17	-577.98	3081
		.000	.000	.990	61.25	31.25					
3A-082	-5388.00				61.25	31.25	1229.34	2998.31	459.71	-388.52	3081
		.000	.000	.990	61.25	31.25					
3A-083	-4.00				61.25	31.25	1310.00	667.00	434.70	341.90	3089
		.000	.000	.000	61.25	31.25					
3A-084	-4.00				61.25	31.25	1310.00	1100.00	436.40	430.60	3089
		.000	.000	.000	61.25	31.25					
3A-085	-3119.00				61.25	31.25	1340.00	-218.00	438.20	424.50	3094
		.000	.000	.330	61.25	31.25					
3A-086	5.00				61.25	31.25	1363.27	627.23	435.04	322.49	3096
		.000	.000	.000	61.25	31.25					
3A-087	5.00				61.25	31.25	1362.17	846.37	435.04	391.52	3096
		.000	.000	.000	61.25	31.25					
3A-088	-5399.00				61.25	31.25	1361.86	3123.75	449.71	-534.80	3096
		.000	.000	.000	61.25	31.25					
3A-089	-5399.00				61.25	31.25	1361.86	3123.75	449.71	-534.80	3096
		.000	.000	.000	61.25	31.25					
3A-090	2.00				61.25	31.25	1420.00	1070.00	437.00	429.30	3103
		.000	.000	.000	61.25	31.25					
3A-091	2.00				61.25	31.25	1420.00	1280.00	438.10	437.50	3103
		.000	.000	.330	61.25	31.25					
3A-092	18.00				67.50	31.25	1470.00	189.00	433.60	122.00	3111
		.000	.000	.000	67.50	31.25					
3A-093	18.00				67.50	31.25	1470.00	822.00	436.30	386.70	3111
		.000	.000	.000	67.50	31.25					
3A-094	-5400.00				67.50	31.25	1502.02	627.53	435.70	322.49	3117
		.000	.000	.000	67.50	31.25					
3A-095	-5400.00				67.50	31.25	1505.04	1044.82	437.91	125.53	3117
		.000	.000	.000	67.50	31.25					
3A-096	10074.00				67.50	31.25	1505.50	794.00	442.10	383.70	3118
		.000	.000	.000	67.50	31.25					
3A-097	-1065.00				67.50	31.25	1523.10	2427.44	447.94	-1184.21	3121
		.000	.000	.000	67.50	31.25					
3A-098	-1065.00				67.50	31.25	1522.40	3574.90	457.30	-1029.00	3121
		.000	.000	.000	67.50	31.25					
3A-099	-5395.00				67.50	31.25	1525.40	395.90	438.50	234.10	3122
		.000	.000	1.000	67.50	31.25					
3A-100	-5395.00				67.50	31.25	1525.50	186.70	436.90	120.90	3122
		.000	.000	.000	67.50	31.25					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
350:20:10: 9:205	10:19:122	0: 9:917	3A-101	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:10:21:122	11: 0:953	0:39:831	3A-102	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:11: 2:869	11: 7:869	0: 5: 0	3A-103	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:11: 9:869	11:29:784	0:19:915	3A-104	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:11:31:700	12:51:363	1:19:663	3A-105	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:12:53:363	12:55:862	0: 2:499	3A-106	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:12:57:779	13: 7:779	0:10: 0	3A-107	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:13: 9:694	13:49:526	0:39:832	3A-108	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:13:51:526	14: 1:441	0: 9:915	3A-109	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:14: 3:441	14:25:525	0:22: 84	3A-110	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
350:20:59:43:896	0: 2:979	0:19: 83	3A-111	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
350:22:51: 2:408	52: 1:658	0:59:250	3A-112	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
351: 0: 3:15:409	3:34:659	0:19:250	3A-113	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
351: 0:31:53:409	32: 7:409	0:14: 0	3A-114	S	S	1	MAN	X	4	5	ML	6	X	HI	OK	OK
351: 0:33:17:159	33:19:659	0: 2:500	3A-115	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:33:21:659	33:31:409	0: 9:750	3A-116	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:33:33:409	34:13:409	0:40: 0	3A-117	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:34:15:409	34:20:159	0: 4:750	3A-118	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:34:22:159	34:42:159	0:20: 0	3A-119	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:34:44:159	36: 3:659	1:19:500	3A-120	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	--NRL BIAS-- (ARCSEC) GXB1	GYB1	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-101	-5396.00				67.50	31.25	1525.50	186.70	436.90	120.90	3122
		.000	.000	1.000	67.50	31.25					
3A-102	-5396.00				67.50	31.25	1525.50	186.70	436.90	120.90	3122
		.000	.000	1.000	67.50	31.25					
3A-103	-5396.00				67.50	31.25	1525.60	-32.90	435.20	434.94	3122
		.000	.000	.300	67.50	31.25					
3A-104	-5396.00				67.50	31.25	1525.60	-57.30	435.10	434.15	3122
		.000	.000	.300	67.50	31.25					
3A-105	-5396.00				67.50	31.25	1525.60	-133.50	434.60	429.40	3122
		.000	.000	1.300	67.50	31.25					
3A-106	-5396.00				67.50	31.25	1525.70	-417.40	433.90	383.75	3122
		.000	.000	.000	67.50	31.25					
3A-107	-5396.00				67.50	31.25	1525.70	-431.40	433.90	380.34	3122
		.000	.000	.300	67.50	31.25					
3A-108	-5396.00				67.50	31.25	1525.80	-473.20	432.60	368.18	3122
		.000	.000	.300	67.50	31.25					
3A-109	-5396.00				67.50	31.25	1525.80	-619.70	432.60	322.24	3122
		.000	.000	.300	67.50	31.25					
3A-110	-5396.00				67.50	31.25	1525.80	-661.50	431.40	305.72	3122
		.000	.000	.300	67.50	31.25					
3A-111	-5391.00				67.50	31.25	1527.90	339.40	434.50	204.90	3122
		.000	.000	1.000	67.50	31.25					
3A-112	-5387.00				67.50	31.25	1530.70	3720.20	458.80	-1209.90	3123
		.000	.000	.000	67.50	31.25					
3A-113	-5397.00				67.50	31.25	1535.86	-194.57	432.52	421.61	3124
		.000	.000	.000	67.50	31.25					
3A-114	-5396.00				67.50	31.25	1534.80	3650.10	461.00	-1114.30	3124
		.000	.000	.000	67.50	31.25					
3A-115	-5396.00				67.50	31.25	1535.00	3403.40	460.20	-816.70	3124
		.000	.000	.000	67.50	31.25					
3A-116	-5396.00				67.50	31.25	1535.00	3403.40	460.20	-816.70	3124
		.000	.000	.000	67.50	31.25					
3A-117	-5396.00				67.50	31.25	1535.00	3403.40	460.20	-816.70	3124
		.000	.000	.000	67.50	31.25					
3A-118	-5396.00				67.50	31.25	1535.10	3256.30	459.60	-653.00	3124
		.000	.000	.000	67.50	31.25					
3A-119	-5396.00				67.50	31.25	1535.10	3256.30	459.60	-653.00	3124
		.000	.000	.000	67.50	31.25					
3A-120	-5396.00				67.50	31.25	1535.10	3256.30	459.60	-653.00	3124
		.000	.000	.000	67.50	31.25					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
351: 0:36: 5:659	36: 8:159	0: 2:500	3A-121	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:36:10:159	36:20:159	0:10: 0	3A-122	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:36:22:159	37: 1:909	0:39:750	3A-123	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:37: 3:909	37:13:909	0:10: 0	3A-124	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:37:15:909	37:55:659	0:39:750	3A-125	S	S	1	FLARE	X	4	5	ML	6	X	HI	OK	OK
351: 0:37:57:659	40:36:909	2:39:250	3A-126	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:40:38:909	40:48:909	0:10: 0	3A-127	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:40:50:909	41:30:659	0:39:750	3A-128	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:41:32:659	44:11:909	2:39:250	3A-129	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:44:13:909	44:16:409	0: 2:500	3A-130	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:44:18:409	44:28:409	0:10: 0	3A-131	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:44:30:159	45:10:159	0:40: 0	3A-132	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:45:12:159	45:21:909	0: 9:750	3A-133	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:45:23:909	46: 3:909	0:40: 0	3A-134	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:46: 5:909	48:45:159	2:39:250	3A-135	S	S	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:48:47:159	48:56:909	0: 9:750	3A-136	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:48:58:909	49:38:909	0:40: 0	3A-137	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 0:49:40:659	52:20:159	2:39:500	3A-138	L	L	1	FLARE	X	4	5	ML	6	B	HI	OK	OK
351: 1:39: 6:409	39:25:409	0:19: 0	3A-139	S	S	1	MAN	X	4	5	MA	6	B	HI	OK	OK
351: 1:49:28:494	49:47:244	0:18:750	3A-140	S	S	1	MAN	X	4	5	MA	6	B	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	--NRL BIAS-- (ARCSEC) GXBI	GYBI	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-121	-5396.00				67.50	31.25	1535.40	2928.60	457.80	-326.90	3124
		.000	.000	.000	67.50	31.25					
3A-122	-5396.00				67.50	31.25	1535.40	2928.60	457.80	-326.90	3124
		.000	.000	.000	67.50	31.25					
3A-123	-5396.00				67.50	31.25	1535.40	2928.60	457.80	-326.90	3124
		.000	.000	.000	67.50	31.25					
3A-124	-5396.00				67.50	31.25	1535.60	2752.20	456.70	-174.00	3124
		.000	.000	.000	67.50	31.25					
3A-125	-5396.00				67.50	31.25	1535.60	2752.20	456.70	-174.00	3124
		.000	.000	.000	67.50	31.25					
3A-126	-5396.00				67.50	31.25	1535.60	2752.20	456.70	-174.00	3124
		.000	.000	.000	67.50	31.25					
3A-127	-5396.00				67.50	31.25	1536.20	2189.60	452.60	203.60	3124
		.000	.000	.000	67.50	31.25					
3A-128	-5396.00				67.50	31.25	1536.20	2189.60	452.60	203.60	3124
		.000	.000	.000	67.50	31.25					
3A-129	-5395.00				67.50	31.25	1536.40	1994.00	451.10	294.60	3124
		.000	.000	.000	67.50	31.25					
3A-130	-5395.00				67.50	31.25	1537.00	1391.90	446.20	440.40	3124
		.000	.000	.000	67.50	31.25					
3A-131	-5395.00				67.50	31.25	1537.00	1391.90	446.20	440.40	3124
		.000	.000	.000	67.50	31.25					
3A-132	-5395.00				67.50	31.25	1537.00	1391.90	446.20	440.40	3124
		.000	.000	.000	67.50	31.25					
3A-133	-5395.00				67.50	31.25	1537.20	1187.40	444.50	443.40	3124
		.000	.000	.000	67.50	31.25					
3A-134	-5395.00				67.50	31.25	1537.20	1187.40	444.50	443.40	3124
		.000	.000	.000	67.50	31.25					
3A-135	-5395.00				67.50	31.25	1537.30	981.50	442.80	422.70	3124
		.000	.000	.000	67.50	31.25					
3A-136	-5395.00				67.50	31.25	1537.60	566.70	439.40	308.70	3124
		.000	.000	.000	67.50	31.25					
3A-137	-5395.00				67.50	31.25	1537.60	566.70	439.40	308.70	3124
		.000	.000	.000	67.50	31.25					
3A-138	-5395.00				67.50	31.25	1537.80	358.20	437.80	215.40	3124
		.000	.000	.300	67.50	31.25					
3A-139	-1217.00				67.50	31.25	1540.00	375.50	434.90	223.10	3125
		.000	.000	.000	67.50	31.25					
3A-140	-1217.00				67.50	31.25	1539.40	2401.90	448.30	70.50	3125
		.000	.000	.000	67.50	31.25					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
351: 1:59:57:549	0:55:876	0:58:329	3A-141	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
351: 2:11:19:909	11:39:409	0:19:500	3A-142	S	S	1	MAN	X	4	5	G3	6	X	HI	OK	OK
351: 2:12: 0:409	12:59:409	0:59: 0	3A-143	L	L	1	MAN	X	4	5	G3	6	X	HI	OK	OK
351:15:37:27:208	38:25:958	0:58:750	3A-144	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
351:15:39:16:458	39:35:958	0:19:500	3A-145	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
351:23:26:33:735	26:52:566	0:18:831	3A-146	S	S	1	MAN	2	X	5	M3	6	X	HI	OK	OK
352:13:24:24: 8	25:23: 8	0:59: 0	3A-147	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
352:13:25:37:508	25:57: 8	0:19:500	3A-148	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
353: 6:32: 7:422	32:17:421	0: 9:999	3A-149	S	S	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353: 6:32:19:421	32:39:336	0:19:915	3A-150	L	L	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353: 6:32:41:253	33:21: 86	0:39:833	3A-151	S	S	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353: 6:33:23: 86	34:42:751	1:19:665	3A-152	L	L	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353: 6:34:44:668	37:24: 58	2:39:390	3A-153	S	S	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353: 6:37:26: 58	42:44:558	5:18:500	3A-154	L	L	1	AUTO 2	X	X	5	MA	6	X	HI	OK	OK
353:12:59:40: 83	1:39:558	1:59:475	3A-155	L	L	1	MAN	X	4	5	MA	6	B	HI	OK	OK
353:13: 8:56: 58	9:35:558	0:39:500	3A-156	S	S	1	MAN	X	X	5	MA	6	B	HI	OK	OK
353:14:19:57:308	20:56:808	0:59:500	3A-157	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
353:14:21:16: 58	21:35:808	0:19:750	3A-158	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
353:19:38:31: 57	38:50: 57	0:19: 0	3A-159	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
353:20:27: 3: 77	27:22:577	0:19:500	3A-160	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMA	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) GXB1	GYB1	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-141	-3.40				67.50	31.25	1538.50	3812.70	460.10	-1329.10	3125
		.000	.000	.000	67.50	31.25					
3A-142	-5455.00				67.50	31.25	1539.60	2618.80	455.70	-69.20	3125
		.000	.000	.000	67.50	31.25					
3A-143	-5455.00				67.50	31.25	1539.80	2432.40	454.40	61.40	3125
		.000	.000	.700	67.50	31.25					
3A-144	-10800.00				67.50	31.25	1569.71	66.04	433.94	432.68	3133
		.000	.000	.000	67.50	31.25					
3A-145	-10800.00				67.50	31.25	1569.78	482.30	436.04	272.71	3133
		.000	.000	.000	67.50	31.25					
3A-146	-5399.00				67.50	31.25	1580.00	610.00	437.10	323.70	3138
		.000	.000	1.320	67.50	31.25					
3A-147	-10797.00				67.50	31.25	1600.00	300.00	435.90	185.00	3149
		.000	.000	.989	67.50	31.25					
3A-148	-10797.00				67.50	31.25	1600.00	507.00	437.20	283.90	3149
		.000	.000	.000	67.50	31.25					
3A-149	-5196.00				67.50	31.25	1598.08	704.00	439.36	296.88	3157
		.000	.000	.660	67.50	31.25					
3A-150	-5196.00				67.50	31.25	1598.08	704.00	439.36	296.88	3157
		.000	.000	.660	67.50	31.25					
3A-151	-5196.00				67.50	31.25	1598.08	704.00	439.36	296.88	3157
		.000	.000	.660	67.50	31.25					
3A-152	-5196.00				67.50	31.25	1600.00	910.00	440.80	408.80	3157
		.000	.000	.660	67.50	31.25					
3A-153	-5196.00				67.50	31.25	1600.00	1110.00	442.30	437.40	3157
		.000	.000	.660	67.50	31.25					
3A-154	-5196.00				67.50	31.25	1600.00	1720.00	447.10	384.20	3157
		.000	.000	.660	67.50	31.25					
3A-155	-10334.00				67.50	31.25	1592.80	3304.50	459.30	-706.60	3161
		.000	.000	.000	67.50	31.25					
3A-156	10492.00				67.50	31.25	1592.50	3674.50	460.20	-1147.50	3161
		.000	.000	.000	67.50	31.25					
3A-157	4.00				67.50	31.25	1593.80	831.30	440.90	392.10	3161
		.000	.000	.000	67.50	31.25					
3A-158	4.00				67.50	31.25	1593.50	1240.10	444.10	444.00	3161
		.000	.000	.000	67.50	31.25					
3A-159	4.00				67.50	31.25	1590.00	745.00	436.20	366.70	3165
		.000	.000	.000	67.50	31.25					
3A-160	49.00				67.50	31.25	1590.00	-215.00	434.30	420.98	3165
		.000	.000	.000	67.50	31.25					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	OP EXP (I)	(J)	(K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
353:20:40:49:807	41: 8:807	0:19: 0	3A-161	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
354:13:34:50:358	35:49:858	0:59:500	3A-162	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
354:13:36:48:358	37: 7:858	0:19:500	3A-163	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
354:15:16:25:858	18:44:608	0:18:750	3A-164	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
354:16:57:34:608	57:54:358	0:19:750	3A-165	S	S	1	MAN	X	X	5	GS	6	X	HI	OK	OK
354:20: 2:32:408	2:51:908	0:19:500	3A-166	S	S	1	MAN	X	4	5	GS	6	X	HI	OK	OK
354:22:53:41:321	53:53:820	0:12:499	3A-167	S	S	1	MAN	X	4	5	G3	6	X	HI	OK	OK
355: 2:21:52:659	22:51:899	0:59:240	3A-168	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
355: 2:23:14:648	23:33:896	0:19:248	3A-169	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
355:12:55:59:458	56: 8:458	0: 9: 0	3A-170	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
355:14:26:16:958	27:18:208	0:59:250	3A-171	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
355:14:28:16:708	28:26:208	0: 9:500	3A-172	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK
355:19:18: 0:208	18: 9:458	0: 9:250	3A-173	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
355:21:22: 9:708	22:18:958	0: 9:250	3A-174	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
355:22:41:18:708	41:27:708	0: 9: 0	3A-175	S	S	1	MAN	X	4	5	GS	6	X	HI	OK	OK
356: 0:22:44: 8	23: 3:258	0:19:250	3A-176	S	S	1	MAN	X	4	5	ML	6	B	HI	OK	OK
356: 1:18:51:258	19:50: 8	0:58:750	3A-177	L	L	1	MAN	X	X	5	MA	6	X	HI	OK	OK
356: 1:20:54:508	21: 4: 8	0: 9:500	3A-178	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
356:13:52: 3:808	53: 3:308	0:59:500	3A-179	L	L	1	MAN	2	4	5	MA	6	X	HI	OK	OK
356:13:53:31:808	53:51:308	0:19:500	3A-180	S	S	1	MAN	2	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	NRL BIAS (ARCSEC) GXBI	GYBI	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-161	7.00				67.50	31.25	1590.00	2400.00	453.60	81.35	3165
		.000	.000	.000	67.50	31.25					
3A-162	-10800.00				67.50	31.25	1560.00	150.00	436.30	98.34	3175
		.000	.000	.000	67.50	31.25					
3A-163	-10800.00				67.50	31.25	1560.00	392.00	439.20	232.70	3175
		.000	.000	.000	67.50	31.25					
3A-164	6.00				67.50	31.25	1560.00	2160.00	453.20	219.40	3176
		.000	.000	.000	67.50	31.25					
3A-165	6.00				67.50	31.25	1550.00	3190.00	459.70	-576.40	3178
		.000	.000	.000	67.50	31.25					
3A-166	11.00				67.50	31.25	1546.70	2934.46	458.57	-1884.50	3179
		.000	.000	.000	67.50	31.25					
3A-167	-5400.00				67.50	31.25	1541.60	-15.90	436.00	435.93	3180
		.000	.000	.000	67.50	31.25					
3A-168	7.00				67.50	31.25	1530.24	3744.24	461.38	-1234.96	3183
		.000	.000	.660	67.50	31.25					
3A-169	7.00				67.50	31.25	1530.24	3850.78	460.93	-1378.26	3183
		.000	.000	.660	67.50	31.25					
3A-170	-2.00				82.50	28.75	1500.00	375.00	440.60	224.70	3189
		.000	.000	.000	82.50	28.75					
3A-171	6.00				82.50	28.75	1500.00	-38.90	437.40	436.96	3190
		.000	.000	.330	82.50	28.75					
3A-172	6.00				82.50	28.75	1500.00	318.00	440.50	195.50	3190
		.000	.000	.000	82.50	28.75					
3A-173	-9.00				82.50	28.75	1479.22	2399.44	456.45	-1141.79	3193
		.000	.000	.000	82.50	28.75					
3A-174	-4.00				82.50	28.75	1472.38	3773.80	461.26	-1274.21	3195
		.000	.000	.000	82.50	28.75					
3A-175	1.00				82.50	28.75	1466.71	3587.37	455.19	-1049.53	3197
		.000	.000	.000	82.50	28.75					
3A-176	-321.00				82.50	28.75	1461.62	2257.75	443.56	-975.47	3198
		.000	.000	.000	82.50	28.75					
3A-177	-10797.00				82.50	28.75	1458.81	-111.54	436.60	433.01	3199
		.000	.000	.000	82.50	28.75					
3A-178	-10797.00				82.50	28.75	1458.60	131.36	439.65	87.36	3199
		.000	.000	.000	82.50	28.75					
3A-179	-10800.00				82.50	28.75	1410.00	1370.00	450.40	447.00	3204
		.000	.000	.000	82.50	28.75					
3A-180	-10800.00				82.50	28.75	1410.00	1570.00	452.00	423.40	3204
		.000	.000	.000	82.50	28.75					

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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SHUTTER OPEN (A)	SHUTTER CLOSE (B)	EXPOSURE TIME (C)	FRAME COUNT (D)	WVL -G- (E)	WVL -M- (F)	MULT (G)	MODE (H)	(I)	(J)	OP EXP (K)	(L)	(M)	(N)	(O)	TEMP OP (P)	TEMP CL (Q)
356:15:20:50:558	21: 0: 58	0: 9:500	3A-181	S	S	1	MAN	X	X	5	ML	6	X	HI	OK	OK
356:17:12:43:808	12:53: 56	0: 9:250	3A-182	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
356:18:27:38:307	27:48: 57	0: 9:750	3A-183	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
356:20:10:26:807	10:36:557	0: 9:750	3A-184	S	S	1	MAN	X	X	5	ML	6	X	HI	OK	OK
356:21:33: 2:572	33:12:238	0: 9:666	3A-185	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
356:23:12:37:959	12:46:875	0: 8:916	3A-186	S	S	1	MAN	X	X	5	ML	6	X	HI	OK	OK
357: 2:15: 3:558	16: 2:558	0:59: 0	3A-187	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
357: 2:16:17:558	16:36:558	0:19: 0	3A-188	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
357:13: 6:21:608	8:23:108	0: 1:500	3A-189	S	S	1	MAN	X	X	5		6	X	HI	OK	OK
357:13:14:17:838	15:17:584	0:59:746	3A-190	L	L	1	MAN	X	4	5	MA	6	B	HI	OK	OK
357:13:17:34:576	17:53:575	0:18:999	3A-191	S	S	1	MAN	X	4	5	MA	6	B	HI	OK	OK
357:16:36:25:608	38:35:108	0: 9:500	3A-192	S	S	1	MAN	X	4	5		6	X	HI	OK	OK
358: 1:45:27:159	46:26:909	0:59:750	3A-193	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
358: 1:47:19:909	47:28:909	0: 9: 0	3A-194	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
358:14:11:44:772	12:44:101	0:59:329	3A-195	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK
358:14:13:16:683	13:36: 99	0:19:416	3A-196	S	S	1	MAN	X	4	5	MA	6	X	HI	OK	OK
358:17:26:15: 54	26:24:554	0: 9:500	3A-197	S	S	1	MAN	X	X	5	MA	6	X	HI	OK	OK
358:17:46:51:412	47:10:494	0:19: 82	3A-198	S	S	1	MAN	X	X	5	ML	6	X	HI	OK	OK
358:17:48:10:574	49: 9:486	0:58:912	3A-199	L	L	1	MAN	X	X	5	ML	6	X	HI	OK	OK
359: 1:14: 5:508	15: 5:258	0:59:750	3A-200	L	L	1	MAN	X	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC) GAMX	GAMY	(ARCMINS) GAMRR	-NRL BIAS- (ARCSEC) GXBI	GYBI	ANGLE (ARCMINS) -B- OPEN	-E- OPEN	ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
(P)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-181	2.00				82.50	28.75	1400.00	256.00	441.80	162.20	3205
		.000	.000	.000	82.50	28.75					
3A-182	.00				82.50	28.75	1390.00	3800.00	461.00	-1304.00	3207
		.000	.000	.000	82.50	28.75					
3A-183	4.00				82.50	28.75	1390.00	356.00	442.80	215.90	3207
		.000	.000	.000	82.50	28.75					
3A-184	-10.00				82.50	28.75	1380.00	2380.00	457.50	102.70	3208
		.000	.000	.000	82.50	28.75					
3A-185	10.00				82.50	28.75	1370.00	-397.00	437.30	391.91	3209
		.000	.000	.000	82.50	28.75					
3A-186	17.00				82.50	28.75	1360.00	1460.00	451.50	440.00	3210
		.000	.000	.000	82.50	28.75					
3A-187	.00				82.50	28.75	1349.20	713.80	445.90	363.20	3212
		.000	.000	.609	82.50	28.75					
3A-188	.00				82.50	28.75	1349.00	926.00	447.60	417.00	3212
		.000	.000	.000	82.50	28.75					
3A-189	-5355.00				82.50	28.75	1292.69	750.71	447.20	374.95	3218
		.000	.000	.000	82.50	28.75					
3A-190	.00				82.50	28.75	1291.23	2015.77	456.20	293.09	3219
		.000	.000	.000	82.50	28.75					
3A-191	.00				82.50	28.75	1290.51	2622.93	459.26	-65.58	3219
		.000	.000	.000	82.50	28.75					
3A-192	-2.30				82.50	28.75	1272.21	3895.04	453.85	-1456.58	3221
		.000	.000	.330	82.50	28.75					
3A-193	3.00				82.50	28.75	1219.26	3023.28	460.58	-410.77	3226
		.000	.000	.000	82.50	28.75					
3A-194	3.00				82.50	28.75	1218.89	3394.05	461.07	-803.87	3226
		.000	.000	.000	82.50	28.75					
3A-195	.00				82.50	28.75	1142.37	3041.61	460.65	-428.50	3234
		.000	.000	.000	82.50	28.75					
3A-196	.00				82.50	28.75	1142.00	3422.21	460.95	-836.81	3234
		.000	.000	.330	82.50	28.75					
3A-197	9.00				82.50	28.75	1121.29	4260.34	457.27	-1977.92	3236
		.000	.000	.990	82.50	28.75					
3A-198	6.00				82.50	28.75	1121.35	868.62	432.80	394.75	3236
		.000	.000	.330	82.50	28.75					
3A-199	7.00				82.50	28.75	1121.07	429.49	431.58	247.57	3236
		.000	.000	.000	82.50	28.75					
3A-200	4.00				82.50	28.75	1068.99	4295.75	455.12	-4220.65	3240
		.000	.000	.000	82.50	28.75					

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---------- SHUTTER ---------			FRAME COUNT	---WVL---		MULT	MODE	---------- OP EXP ----------							TEMP	
OPEN	CLOSE	EXPOSURE TIME		-G-	-M-										OP	CL
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)
359: 1:15:47:258	16: 6:256	0:19: 0	3A-201	S	5	1	MAN	X	4	5	MA	6	X	HI	OK	OK

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INSTRUMENT OPERATION 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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FRAME COUNT	GAMRR (ARCMINS)	MAX PT EXC (ARCSEC)		(ARCMINS)	--NRL BIAS-- (ARCSEC)		ANGLE (ARCMINS)		ALTITUDE (KM)	Z(M) (KM)	ORBIT NUMBER
		GAMX	GAMY	GAMRR	GXB1	GYB1	-R- OPEN	-E- OPEN			
(D)	(R)	(S)	(T)	(U)			(V)	(W)	(X)	(Y)	(Z)
3A-201	4.00				82.50	28.75	1069.00	4225.28	453.89	-1933.67	3240
		.000	.000	.000	82.50	28.75					

6.0 TEMPERATURE DATA - MSFC

The temperature data was originated at MSFC from the telemetered data during the Skylab Missions. This data is a computer tabulation which has been corrected by coordination with other sources of information. All columns are entered below the respective measurement numbers and the time of each entry is recorded in the left hand column. An entry in each column is made at each SHUTTER OPEN and approximately each five (5) minutes during the time period the shutter remains open. Entries are not made more often than four (4) minute intervals, consequently not all "Shutter Open" will have associated temperature data. This data is provided in the form of a computer printout and is recorded on magnetic tape.

S082A TEMPERATURE

Column	Description
Time	Greenwich Mean Time of Entry
REAR (C090)	Absolute Temperature, Rear Center Base
CENT (C091)	Absolute Temperature, Center Base
FNT (C092)	Absolute Temperature, Front Center Base
REAR (C095)	Absolute Temperature, Rear Center, Right Side
CENT (C096)	Absolute Temperature, Center, Left Side
FNT (C197)	Absolute Temperature, Front Center, Left Side
GRATING (C200)	Absolute Temperature, Grating, Lower Edge
F. CENT (C201)	Differential Temperature, Front Center, Lid to Base
CENT (C202)	Differential Temperature, Center, Lid to Base
R. CENT (C203)	Differential Temperature, Rear Center, Lid to Base
F. CENT (C204)	Differential Temperature, Front Center, Side to Side
CENT (C205)	Differential Temperature, Center, Side to Side
R. CENT (C206)	Differential Temperature, Rear Center, Side to Side

See Figure 6-1 for locations of measurements.

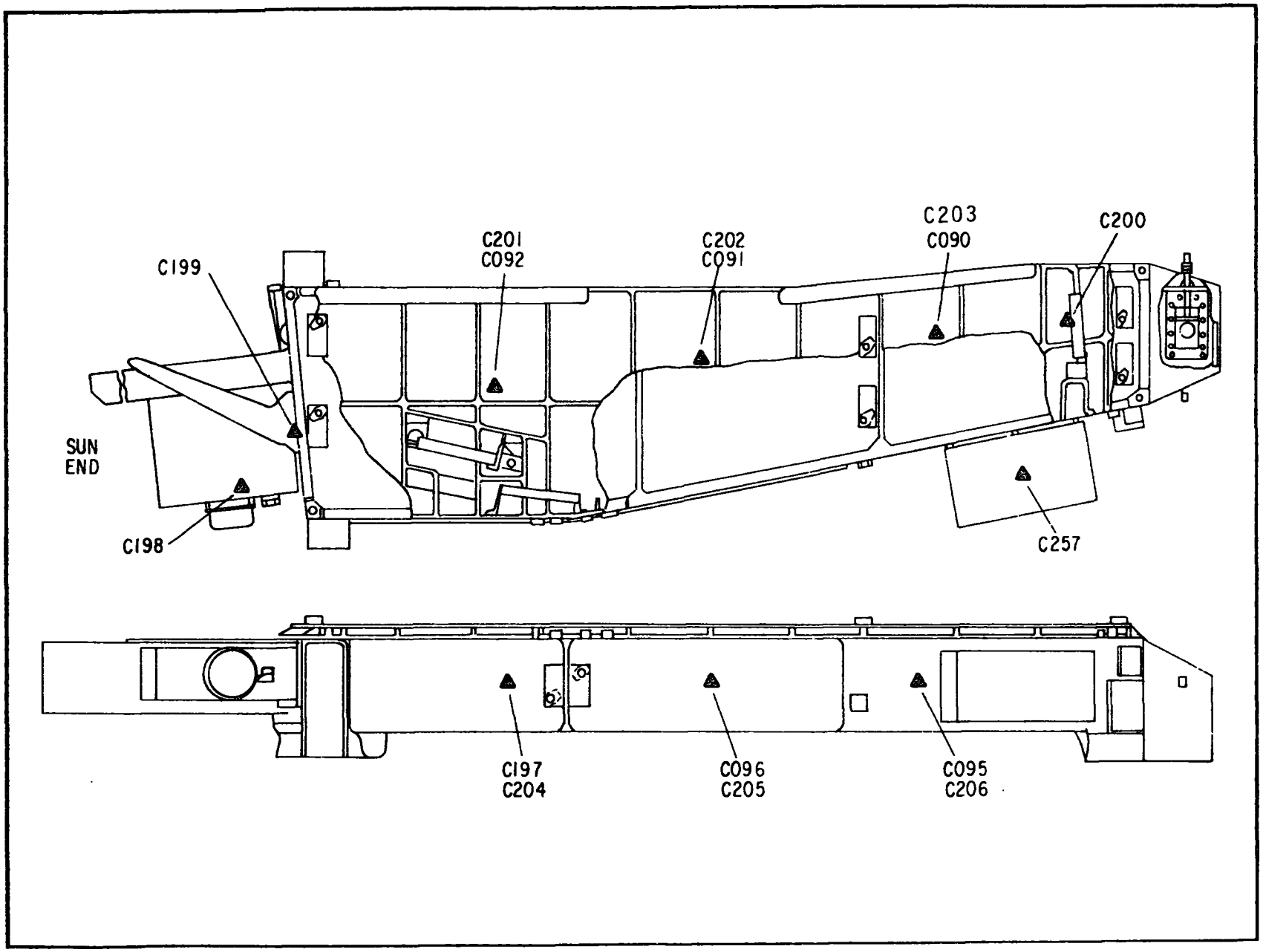

Figure 6-1. Measurement Locations for NRL-A (S082A)

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TEMPERATURE DATA 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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		ABSOLUTE TEMPERATURES							DIFFERENCE TEMPERATURES					
		BASE TEMP (57 TO 83 DEGF)			SIDE TEMP (57 TO 83 DEGF)		GRATING (63 TO 83 DEGF)		LID - BASE (-5 TO 5 DEGF)			SIDE - SIDE (-5 TO 5 DEGF)		
FRAME	TIME	REAR (C090)	CENT (C091)	FNT (C092)	REAR (C095)	CENT (C096)	FNT (C197)	(C200)	F CENT (C201)	CENT (C202)	R CENT (C203)	F CENT (C204)	CENT (C205)	R CENT (C206)
3A-175	355:22:41:18:705	68.59	69.11	69.51	68.62	69.51	69.61	69.66	.58	.25	.29	-.37	.01	-.10
3A-176	356: 0:22:44: 8	68.74	69.33	69.58	68.87	69.58	69.64	70.06	.57	.24	.28	-.42	-.06	-.10
3A-177	356: 1:18:51:259	68.74	69.39	69.58	68.96	69.61	69.67	70.23	.60	.23	.24	-.39	-.09	-.11
3A-178	356: 1:20:54:508	69.74	69.39	69.58	68.96	69.61	69.67	70.23	.60	.23	.24	-.39	-.09	-.11
3A-179	356:13:37:22:710	68.10	69.09	77.35	68.34	69.33	69.61	67.93	.60	.32	.41	-.43	-.02	-.02
3A-180	356:13:52: 3:808	68.10	69.08	69.45	68.31	69.36	69.61	67.93	.62	.30	.40	-.39	-.02	-.02
3A-181	356:15:20:50:568	69.13	69.08	69.45	68.34	69.36	69.61	68.50	.57	.28	.40	-.42	-.02	-.09
3A-182	356:17:12:43:808	68.47	69.11	69.46	68.56	69.48	69.61	69.31	.60	.27	.32	-.37	-.05	-.09
3A-183	356:18:27:38:307	68.59	69.24	69.51	68.71	69.48	69.61	69.48	.57	.24	.30	-.37	-.04	-.10
3A-184	356:20:10:26:807	68.62	69.33	69.58	68.84	69.51	69.61	70.06	.57	.24	.28	-.39	-.06	-.12
3A-185	356:21:33: 2:572	68.84	69.39	69.58	68.93	69.58	69.70	70.40	.57	.24	.24	-.42	-.09	-.10
3A-186	356:23:12:37:957	68.90	69.45	69.58	69.08	69.70	69.73	70.58	.56	.23	.24	-.39	-.09	-.10
3A-187	357: 2:15:17:558	68.96	69.45	69.61	69.11	69.70	69.82	70.06	.56	.23	.24	-.41	-.09	-.09
3A-188	357: 2:16:17:558	68.96	69.45	69.61	69.11	69.70	69.82	70.06	.56	.23	.24	-.41	-.09	-.09
3A-189	357:13: 8:21:608	68.13	69.08	69.45	68.28	69.33	69.61	67.87	.57	.32	.41	-.39	-.05	-.03
3A-190	357:13:14:17:638	68.13	69.08	69.45	68.34	69.33	69.58	67.70	.60	.32	.41	-.35	-.02	-.02
3A-191	357:13:56:44:108	68.10	69.09	69.48	68.34	69.33	69.61	68.04	.60	.32	.41	-.41	-.01	-.05
3A-192	357:16:38:25:608	68.13	69.06	69.33	68.37	69.33	69.51	68.22	.63	.28	.40	-.35	-.04	-.05
3A-193	358: 1:45:27:159	68.10	69.02	69.45	68.28	69.30	69.61	67.70	.57	.29	.41	-.42	-.09	-.02
3A-194	358: 1:47:19:909	68.10	69.08	69.58	68.22	69.33	69.61	67.70	.57	.29	.41	-.39	-.04	-.02
3A-195	358:14:11:44:772	67.97	68.96	69.42	68.13	69.24	69.58	67.52	.59	.32	.45	-.42	.01	-.02
3A-197	358:17:26:15: 54	68.22	69.08	69.45	68.37	69.39	69.61	68.62	.62	.32	.37	-.39	-.02	-.09
3A-198	358:17:46:51:412	68.28	69.08	69.45	68.59	69.45	69.58	68.73	.60	.28	.38	-.42	-.04	-.06
3A-200	359: 1:14: 5:508	68.13	69.11	69.61	68.37	69.39	69.82	67.93	.56	.27	.40	-.39	-.07	-.02

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TEMPERATURE DATA 5- 7-75 AT 9 HOURS 7 MINS 15 SECS
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		ABSOLUTE TEMPERATURES							DIFFERENCE TEMPERATURES					
		BASE TEMP (57 TO 83 DEGF)			SIDE TEMP (57 TO 83 DEGF)		GRATING (63 TO 83 DEGF)		LID - BASE (-5 TO 5 DEGF)			SIDE - SIDE (-5 TO 5 DEGF)		
FRAME	TIME	REAR (C090)	CENT (C091)	FNT (C092)	REAR (C095)	CENT (C096)	FNT (C197)	(C200)	F CENT (C201)	CENT (C202)	R CENT (C203)	F CENT (C204)	CENT (C205)	R CENT (C206)
3A-115	351: 0:33:17:159	68.71	69.27	69.45	68.81	69.51	69.61	70.00	.57	.24	.32	-.42	-.05	-.10
3A-121	351: 0:36: 5:659	68.71	69.27	69.48	68.84	69.58	69.61	69.83	.63	.24	.27	-.35	-.05	-.10
3A-124	351: 0:37: 3:909	68.62	69.24	69.48	68.84	69.58	69.61	70.00	.57	.24	.29	-.39	-.06	-.10
3A-129	351: 0:41:32:659	68.71	69.33	69.51	68.84	69.58	69.61	70.06	.57	.24	.29	-.39	-.06	-.09
3A-130	351: 0:44:13:909	68.62	69.30	69.51	68.84	69.58	69.61	70.06	.57	.24	.24	-.42	-.06	-.09
3A-136	351: 0:48:47:159	68.71	69.33	69.48	68.84	69.51	69.61	70.06	.60	.24	.27	-.39	-.05	-.10
3A-138	351: 0:49:40:659	68.71	69.33	69.48	68.87	69.51	69.64	70.29	.57	.25	.34	-.35	-.09	-.10
3A-139	351: 1:39: 6:409	68.81	69.33	69.51	68.99	69.58	69.64	70.46	.57	.23	.24	-.34	-.08	-.10
3A-140	351: 1:49:28:494	68.81	69.33	69.51	68.96	69.61	69.61	70.58	.57	.24	.27	-.35	-.05	-.10
3A-141	351: 1:59:57:549	68.84	69.33	69.51	69.02	69.58	69.61	70.58	.57	.23	.24	-.35	-.09	-.10
3A-142	351: 2:11:19:909	68.87	69.39	69.58	68.99	69.58	69.61	70.69	.57	.23	.24	-.37	-.09	-.12
3A-143	351: 2:12: 0:409	68.87	69.39	69.58	68.99	69.58	69.61	70.69	.57	.23	.24	-.37	-.09	-.12
3A-144	351:15:37:27:208	67.97	69.02	69.39	68.13	69.33	69.51	67.58	.62	.32	.44	-.37	-.02	-.04
3A-146	351:23:26:33:735	68.62	69.27	69.51	68.90	69.58	69.61	69.54	.57	.24	.32	-.42	-.09	-.09
3A-147	352:13:24:24: P	67.94	68.84	69.14	68.13	69.11	69.27	67.52	.66	.34	.48	-.34	.01	-.02
3A-148	352:13:25:37:508	67.91	68.90	69.11	68.13	69.11	69.24	67.52	.66	.34	.41	-.31	.01	-.02
3A-149	353: 6:32: 7:422	68.59	69.33	69.46	68.90	69.58	69.61	69.08	.57	.23	.32	-.42	-.09	-.09
3A-153	353: 6:37: 7:741	68.59	69.33	69.58	68.87	69.58	69.61	69.14	.58	.24	.32	-.42	-.06	-.06
3A-154	353: 6:37:26: 58	68.59	69.33	69.48	68.74	69.51	69.61	69.14	.57	.24	.32	-.42	-.08	-.02
3A-154	353: 6:42: 7:741	68.62	69.33	69.58	68.81	69.58	69.61	69.31	.56	.24	.32	-.43	-.06	-.09
3A-155	353:12:59:40: 83	68.28	69.11	69.58	68.34	69.39	69.61	68.39	.60	.27	.38	-.42	-.06	.01
3A-156	353:13: 8:56: 58	68.28	69.21	69.51	68.47	69.45	69.61	68.50	.57	.28	.40	-.37	-.05	-.06
3A-157	353:14:19:57:308	68.34	69.11	69.51	68.50	69.42	69.61	68.85	.57	.28	.35	-.37	-.04	-.09
3A-158	353:14:19:57:491	68.34	69.11	69.51	68.50	69.42	69.61	68.85	.57	.28	.35	-.37	-.04	-.09
3A-159	353:19:38:31: 57	68.34	69.21	69.51	68.59	69.39	69.61	68.75	.57	.27	.34	-.43	-.06	-.06
3A-160	353:20:27: 3: 77	68.47	69.11	69.58	68.59	69.45	69.61	68.91	.57	.29	.32	-.43	-.05	-.06
3A-161	353:20:27: 3:126	68.47	69.11	69.58	68.59	69.45	69.61	68.91	.57	.29	.32	-.43	-.06	-.06
3A-162	354:13:34:50:358	68.04	68.96	69.39	68.13	69.24	69.51	67.57	.57	.32	.41	-.39	-.02	-.02
3A-163	354:13:34:50:542	68.04	68.96	69.39	68.13	69.24	69.51	67.58	.57	.32	.41	-.39	-.02	-.02
3A-164	354:15:18:25:858	68.10	68.99	69.33	68.28	69.27	69.48	68.39	.65	.32	.40	-.34	-.02	-.09
3A-165	354:16:57:34:608	68.37	69.11	69.39	68.53	69.36	69.48	69.66	.60	.29	.35	-.42	-.09	-.09
3A-166	354:20: 2:32:409	68.62	69.27	69.58	68.87	69.58	69.61	70.06	.57	.23	.29	-.42	-.09	-.12
3A-167	354:22:53:41:321	68.84	69.45	69.61	68.96	69.61	69.76	69.89	.56	.24	.27	-.43	-.09	-.08
3A-168	355: 2:21:52:659	68.62	69.36	69.58	68.87	69.61	69.82	69.14	.57	.24	.32	-.40	-.09	-.09
3A-169	355: 2:21:52:700	68.62	69.36	69.58	68.87	69.57	69.61	69.43	.57	.23	.32	-.42	-.06	-.08
3A-170	355:12:55:59:458	68.04	69.08	69.42	68.22	69.33	69.61	67.70	.60	.30	.44	-.39	-.02	-.02
3A-171	355:14:26:18:958	68.13	68.99	69.45	68.34	69.33	69.58	68.78	.60	.24	.41	-.37	-.02	-.06
3A-172	355:14:26:18:975	68.13	68.99	69.45	68.34	69.33	69.58	68.78	.60	.24	.41	-.37	-.02	-.06
3A-173	355:19:18: 0:209	68.34	69.11	69.58	68.53	69.39	69.70	68.50	.57	.24	.37	-.42	-.09	-.05
3A-174	355:21:22: 9:708	68.47	69.21	69.51	68.59	69.45	69.73	69.14	.57	.27	.33	-.38	-.04	-.09

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		ABSOLUTE TEMPERATURES							DIFFERENCE TEMPERATURES					
		BASE TEMP (57 TO 83 DEGF)			SIDE TEMP (57 TO 83 DEGF)		GRATING (63 TO 83 DEGF)		LID - BASE (-5 TO 5 DEGF)			SIDE - SIDE (-5 TO 5 DEGF)		
FRAME	TIME	REAR (C090)	CENT (C091)	FNT (C092)	REAR (C095)	CENT (C096)	FNT (C197)	(C200)	F CENT (C201)	CENT (C202)	R CENT (C203)	F CENT (C204)	CENT (C205)	R CENT (C206)
3A-061	342:16:21: 4:908	68.04	68.84	69.11	68.13	69.21	69.24	68.10	.69	.33	.41	-.38	.03	-.06
3A-062	343:13:24: 2:602	67.73	68.62	68.81	68.04	69.02	68.99	67.24	.73	.38	.48	-.28	.01	-.02
3A-063	343:13:27:16: 96	67.73	68.62	68.81	68.04	69.02	68.99	67.24	.73	.38	.48	-.28	.01	-.02
3A-064	344:15:47: 6:264	67.85	68.84	69.24	68.04	69.21	69.45	67.29	.65	.33	.48	-.39	.01	.01
3A-065	344:15:48:30:595	67.91	68.84	69.27	68.04	69.21	69.36	67.29	.65	.36	.46	-.37	.01	-.02
3A-066	344:23:46: 3:658	68.13	69.05	69.39	68.34	69.33	69.51	68.22	.63	.32	.40	-.35	-.04	-.06
3A-067	345: 0: 9:46:409	68.13	69.05	69.33	68.37	69.33	69.51	68.45	.63	.28	.40	-.35	-.02	-.04
3A-069	345:15: 5:28:855	67.85	68.84	69.27	68.04	69.11	69.45	67.29	.65	.34	.46	-.39	-.02	-.02
3A-070	345:15: 6:52:603	67.85	68.84	69.27	68.04	69.11	69.45	67.29	.65	.34	.46	-.39	-.02	-.02
3A-071	345:16:40:23: 8	68.00	68.96	69.27	68.13	69.21	69.36	68.22	.65	.33	.41	-.35	-.02	-.06
3A-072	345:16:52: 5:509	68.10	69.00	69.31	68.19	69.22	69.39	68.51	.65	.33	.42	-.37	-.02	-.07
3A-073	345:18:12: 0:988	68.25	69.08	69.33	68.41	69.33	69.48	69.08	.65	.29	.36	-.35	-.03	-.10
3A-074	345:18:19:36:757	68.13	69.02	69.33	68.47	69.33	69.52	69.14	.62	.32	.37	-.34	.00	-.09
3A-075	346:16: 0: 3:808	67.97	68.96	69.33	68.13	69.27	69.52	67.70	.63	.32	.44	-.39	.00	-.02
3A-076	346:16: 2: 8: 58	67.97	68.96	69.33	68.13	69.24	69.49	67.52	.63	.33	.45	-.35	-.02	-.02
3A-077	347: 2:50:39:859	68.71	69.33	69.51	68.64	69.58	69.70	69.66	.57	.24	.29	-.42	-.06	-.09
3A-079	347:13:52:15:608	68.04	68.96	69.39	68.22	69.27	69.51	67.70	.63	.32	.41	-.39	-.02	-.02
3A-080	347:13:52:15:625	68.04	69.96	69.39	68.22	69.27	69.51	67.70	.63	.32	.41	-.39	-.02	-.02
3A-081	348: 1: 5:20:708	68.87	69.42	69.58	69.08	69.61	69.70	70.40	.57	.20	.23	-.39	-.06	-.10
3A-082	348: 1: 5:20:892	68.87	69.42	69.58	69.08	69.61	69.70	70.40	.57	.20	.23	-.39	-.06	-.10
3A-083	348:14:36: 3:958	68.00	69.08	69.39	68.22	69.33	69.51	67.70	.60	.32	.44	-.42	.01	-.02
3A-084	348:14:38:29:708	67.97	69.02	69.45	68.22	69.33	69.58	67.70	.63	.32	.41	-.42	.00	-.02
3A-085	349:21:33:46:507	68.59	69.21	69.56	68.71	69.45	69.70	70.06	.57	.25	.32	-.37	-.05	-.10
3A-086	349: 1:28:14:758	68.59	69.27	69.33	68.78	69.48	69.51	69.14	.62	.24	.33	-.35	-.04	-.08
3A-088	349: 1:41: 3: 41	68.59	69.24	69.24	68.74	69.45	69.48	69.14	.65	.24	.37	-.39	-.06	-.09
3A-090	349:13:57: 2: 58	68.03	68.99	69.33	68.13	69.26	69.45	67.76	.63	.32	.41	-.42	-.02	-.02
3A-091	349:13:58:20: 58	67.97	68.91	69.33	68.13	69.33	69.45	67.58	.65	.32	.44	-.38	-.05	-.04
3A-092	350: 2:19:31:359	68.44	69.27	69.58	68.62	69.45	69.73	68.73	.57	.24	.33	-.42	-.04	-.06
3A-094	350:13:14: 6: 0	68.00	69.02	69.39	68.13	69.27	69.58	67.70	.60	.32	.41	-.42	.01	-.02
3A-095	350:13:16:28: 0	68.00	69.12	69.40	68.13	69.24	69.58	67.70	.60	.32	.42	-.42	.00	-.02
3A-096	350:13:54:43:350	68.00	68.96	69.45	68.13	69.33	69.58	67.58	.63	.32	.46	-.42	-.05	-.02
3A-097	350:19:36:32:908	68.34	69.11	69.45	68.53	69.39	69.58	68.73	.57	.27	.37	-.37	-.05	-.04
3A-098	350:19:43:11:658	68.34	69.11	69.45	68.53	69.51	69.58	68.62	.60	.27	.36	-.39	-.02	-.06
3A-099	350:20: 9: 8:542	68.37	69.11	69.45	68.59	69.33	69.58	69.14	.57	.27	.36	-.37	-.04	-.09
3A-100	350:20:10: 4:706	68.37	69.11	69.45	68.59	69.33	69.58	69.14	.57	.27	.36	-.37	-.04	-.09
3A-108	350:20:13: 9:694	68.37	69.08	69.45	68.53	69.45	69.61	69.14	.60	.27	.36	-.35	-.02	-.09
3A-111	350:20:59:43:896	68.47	69.11	69.45	68.59	69.45	69.61	69.37	.60	.27	.36	-.35	-.02	-.09
3A-112	350:22:51: 2:408	68.59	69.18	69.45	68.78	69.48	69.61	69.66	.57	.24	.29	-.39	.01	-.09
3A-113	351: 0: 3:15:409	68.62	69.24	69.45	68.84	69.51	69.61	69.89	.57	.23	.26	-.33	-.04	-.10
3A-114	351: 0:31:53:409	68.62	69.27	69.45	68.84	69.51	69.61	69.94	.63	.24	.28	-.35	-.06	-.10

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FRAME	TIME	ABSOLUTE TEMPERATURES: BASE TEMP (57 TO 83 DEGF) REAR (C090)	BASE TEMP CENT (C091)	BASE TEMP FNT (C092)	SIDE TEMP (57 TO 83 DEGF) REAR (C095)	SIDE TEMP CENT (C096)	GRATING (63 TO 83 DEGF) FNT (C197)	GRATING (C200)	DIFFERENCE TEMPERATURES: LID - BASE (-5 TO 5 DEGF) F CENT (C201)	LID - BASE CENT (C202)	LID - BASE R CENT (C203)	SIDE - SIDE (-5 TO 5 DEGF) F CENT (C204)	SIDE - SIDE CENT (C205)	SIDE - SIDE R CENT (C206)
3A-001	326:19:10:52:250	67.48	68.84	69.48	67.76	69.11	69.61	67.12	.58	.38	.57	-.34	.03	.14
3A-002	331: 1:27:34:308	67.73	68.84	69.08	68.04	69.08	69.11	67.29	.66	.40	.48	-.26	.04	-.02
3A-004	331:13:58:52:602	67.85	68.84	69.08	68.04	69.11	69.27	67.29	.70	.36	.48	-.30	.03	-.01
3A-005	331:14: 1: 2:908	67.79	68.84	69.08	68.04	69.08	69.21	67.29	.69	.36	.48	-.29	.03	-.05
3A-006	332:14:44:57:500	67.85	68.84	69.05	68.10	69.11	69.33	67.29	.66	.36	.46	-.38	.03	-.02
3A-007	332:14:51: 7:597	67.85	68.84	69.08	68.10	69.08	69.21	67.29	.69	.36	.48	-.33	.01	.01
3A-008	332:17:51:32:203	68.10	68.96	69.11	68.28	69.24	69.33	68.16	.65	.32	.41	-.35	.01	-.06
3A-009	332:17:58:55: 92	68.10	68.96	69.21	68.13	69.24	69.36	68.16	.66	.33	.41	-.35	-.02	-.04
3A-010	332:18: 0:23:757	68.07	68.96	69.21	68.25	69.27	69.33	68.22	.66	.29	.41	-.35	.00	-.01
3A-013	332:18: 4:55:324	68.10	68.87	69.15	68.19	69.18	69.30	68.22	.66	.32	.41	-.33	.01	-.05
3A-015	332:18: 7:55:400	68.10	68.96	69.11	68.25	69.27	69.33	68.22	.66	.34	.40	-.32	.01	-.06
3A-018	332:18:12:26:793	68.04	68.96	69.27	68.28	69.24	69.36	68.40	.67	.32	.40	-.32	.01	-.05
3A-021	332:18:16:54:958	68.04	68.93	69.21	68.28	69.24	69.40	68.22	.66	.32	.41	-.35	-.02	-.05
3A-024	332:18:21:25: 33	68.10	68.96	69.24	68.28	69.27	69.40	68.45	.65	.32	.41	-.31	.01	-.05
3A-026	332:18:24:24:939	69.13	68.96	69.24	68.34	69.30	69.45	68.50	.65	.33	.41	-.35	-.01	-.06
3A-027	332:18:27:23:458	68.10	68.96	69.27	68.34	69.27	69.42	68.62	.65	.32	.41	-.38	.01	-.06
3A-028	333:14:14:25:350	67.91	68.84	69.08	68.13	69.11	69.24	67.52	.69	.36	.46	-.34	.04	-.02
3A-029	333:14:16:17:926	67.97	68.84	69.05	68.10	69.11	69.33	67.70	.67	.36	.46	-.35	.01	-.02
3A-030	333:17:10:31:508	68.34	69.08	69.33	68.47	69.36	69.45	69.02	.62	.29	.37	-.37	-.02	-.09
3A-031	334:14:54:49:240	67.91	68.84	69.08	68.13	69.14	69.24	67.70	.68	.36	.48	-.30	-.01	-.05
3A-032	334:14:57: 8:308	69.91	68.84	69.10	68.13	69.21	69.24	67.71	.68	.36	.48	-.30	-.01	-.05
3A-033	335: 1:46:32:359	67.76	68.74	68.87	68.04	69.08	69.08	67.47	.73	.40	.48	-.26	.02	-.02
3A-034	335: 1:48:29:859	67.76	68.74	68.87	68.04	69.08	69.08	67.47	.73	.40	.48	-.26	.02	-.02
3A-035	335:15:50:10:920	67.79	68.62	68.74	67.97	69.02	69.02	67.29	.70	.37	.48	-.26	.03	-.02
3A-036	335:15:53:12:658	67.79	68.62	68.74	67.97	69.02	69.02	67.29	.70	.37	.48	-.26	.03	-.02
3A-037	336:15: 4: 8:717	67.85	68.84	68.96	68.10	69.08	69.11	67.47	.74	.36	.46	-.29	.02	-.02
3A-039	336:15:15:39:434	67.85	68.78	69.02	68.10	69.11	69.11	67.47	.71	.36	.46	-.33	-.01	-.02
3A-046	337:12:53: 2:274	67.91	68.84	68.99	68.10	69.11	69.11	67.29	.71	.36	.45	-.29	.03	-.02
3A-048	338: 2:48:36:359	68.84	69.39	69.46	69.02	69.61	69.61	70.46	.60	.24	.27	-.42	-.04	-.10
3A-049	338:13:47: 5:557	67.97	68.87	69.08	68.22	69.11	69.27	67.70	.70	.33	.44	-.35	.02	-.02
3A-051	338:14:23: 1:359	68.00	68.90	69.08	68.13	69.14	69.27	68.04	.66	.36	.44	-.37	-.02	-.05
3A-053	339:13: 0: 8:955	67.79	68.74	68.96	68.10	69.08	69.11	67.29	.66	.36	.48	-.28	-.01	-.06
3A-054	339:13: 3: 2:946	67.79	68.74	68.96	68.10	69.08	69.11	67.29	.66	.36	.48	-.28	-.01	-.06
3A-055	341:12:11:27:106	67.79	68.65	68.96	68.00	69.08	69.11	67.24	.71	.37	.48	-.30	.05	-.02
3A-056	341:12:11:27:108	67.79	68.65	68.96	68.00	69.08	69.11	67.24	.71	.37	.48	-.30	.05	-.02
3A-057	341:12:11:27:108	67.79	68.65	68.96	68.00	69.08	69.11	67.24	.71	.37	.48	-.30	.05	-.02
3A-058	341:20:55:16:608	67.74	68.62	68.84	68.00	68.93	68.96	67.29	.73	.37	.48	-.25	.03	-.02
3A-059	342:12:45:27:505	67.85	68.78	68.96	68.10	69.11	69.11	67.47	.71	.36	.44	-.28	-.01	-.02
3A-060	342:12:48:14:913	67.85	68.78	68.96	68.10	69.11	69.11	67.47	.71	.36	.44	-.28	-.01	-.02
3A-061	342:15:51: 5:408	67.97	68.84	69.08	68.13	69.11	69.21	67.93	.69	.36	.41	-.30	.01	-.05

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