JSC-09149

ASTP

FINAL

PCN-1

NOTE: This is a PAGE CHANGE NOTICE to be incorporated into the previous edition. DISCARD ONLY the changed out pages.

PHOTO OPERATIONS BOOK

PREPARED BY
PROCEDURES BRANCH
CREW TRAINING & PROCEDURES DIVISION

National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas

JUNE 23, 1975

86

JSC-09149
PA-N6-11180-4

ASTP

PHOTO OPS BOOK

JUNE 23, 1975

PREPARED BY: Gerald Shinkle
GERALD SHINKLE
BOOK MANAGER

APPROVED BY: J C Smith Jr 6-24-75
J.C. SMITH, CHIEF
EXPERIMENT PROCEDURES SECTION
CREW TRAINING & PROCEDURES DIV

It is requested that any organization having comments, questions, or suggestions concerning this document contact Gerald Shinkle, telephone 483-4637.

This document is under configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the ASTP Flight Data File Manager, T. W. Holloway, CG5, Bldg. 4, Rm 225A, telephone 483-4471.

Distribution of this document is controlled by Ted A. Guillory, CG54, 483-4471.

CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT PHOTO OPS BOOK CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
001	PCN-1	4/1/75	
002	PCN-1	4/1/75	
003	PCN-1	4/1/75	
004	FINAL	5/23/75	
005	FINAL	5/23/75	
006	FINAL	5/23/75	
007	FINAL	5/23/75	
008	FINAL	5/23/75	
009	FINAL	5/23/75	
010	PCN-1	6/23/75	
011	PCN-1	6/23/75	
012	PCN-1	6/23/75	
013	PCN-1	6/23/75	

☆ U.S. GOVERNMENT PRINTING OFFICE: 1975—671-210/141

PCN-1
DATE 6/23/75

DELETED

Delete the following pages:

3-3
3-4
3-5
3-6
3-7
3-8
A-1
A-2
A-3
A-4
A-5
A-6
B-1
B-2
B-3
B-4

PHOTO OPS BOOK

LIST OF EFFECTIVE PAGES

~~FINAL 5/23/75~~
PCN-1 6/23/75

PAGE	DATE	PAGE	DATE
*i	6/23/75	5-10	5/23/75
*ii	6/23/75	5-11	5/23/75
*iii	6/23/75	5-12	5/23/75
iv	5/23/75	5-13	5/23/75
*v	6/23/75	*5-14	6/23/75
vi	5/23/75	5-15	5/23/75
*1-1	6/23/75	5-16	5/23/75
1-2	5/23/75	6-1	5/23/75
*1-3	6/23/75	6-2	5/23/75
1-4	5/23/75	6-3	5/23/75
2-1	5/23/75	6-4	5/23/75
*2-2	6/23/75	7-1	5/23/75
*2-3	6/23/75	7-2	5/23/75
2-4	5/23/75	*7-3	6/23/75
*2-5	6/23/75	7-4	5/23/75
*2-6	6/23/75	8-1	5/23/75
2-7	5/23/75	8-2	5/23/75
2-8	5/23/75	8-3	5/23/75
*3-1	6/23/75	8-4	5/23/75
*3-2	6/23/75	8-5	5/23/75
*3-3	DELETED	8-6	5/23/75
*3-4	DELETED	8-7	5/23/75
*3-5	DELETED	8-8	5/23/75
*3-6	DELETED	9-1	5/23/75
*3-7	DELETED	9-2	5/23/75
*3-8	6/23/75	9-3	5/23/75
4-1	5/23/75	9-4	5/23/75
*4-2	6/23/75	*10-1	6/23/75
5-1	5/23/75	*10-2	6/23/75
5-2	5/23/75	*A-1	DELETED
5-3	5/23/75	*A-2	DELETED
5-4	5/23/75	*A-3	DELETED
5-5	5/23/75	*A-4	DELETED
5-6	5/23/75	*A-5	DELETED
5-7	5/23/75	*A-6	DELETED
5-8	5/23/75		
5-9	5/23/75	*Current Change	

PAGE	DATE
*B-1	DELETED
*B-2	DELETED
*B-3	DELETED
*B-4	DELETED

*Current Change

CONTENTS

THIS PAGE INTENTIONALLY BLANK

INTRODUCTION

The information contained herein was derived from several sources. Film stowage and the approved list of equipment are based on the latest stowage maps (dated 5/12/75). The joint photo reqts and procedures are as negotiated at the April, '75 joint US-USSR WG meeting. Solo Photo Reqts are based on the 4/16/75 Mission Requirements Document.

THIS PAGE INTENTIONALLY BLANK

1.0 FILM STOWAGE AND IDENTIFICATION

This section lists the film magazines and cassettes, their stowage locations for launch and entry, the allocated uses (if non-dedicated), the dedicated uses, and the footage or frames in each.

The following film codes are used:

CI - SO168 (ASA 500) color interior
CX - SO368 (ASA 64) color exterior
CT - SO242 color terrain
CS - EFB color compatible with tungsten lighting
IR - SO289 infrared
IF - 2443 false color infrared

BACK

COLOR_____

1-2 DATE 5/23/75

FILM STOWAGE

MAG ID	MAG TYPE	FOOTAGE /FRAMES	LOC LNCH	LOC NTRY	ACTIVITY DED	ACTIVITY NON-DED
CI01	16MM	140'	D3	D3	SOLO FLIGHT	
CI02	16MM	|	CAM/D3	D3	DM CHECKOUT	
CI03	16MM	|	D3	D3	INIT GREETING	
CI04	16MM	|	D3	D3	2ND JAP-APOLLO	
CI05	16MM	|	D3	D3	2ND JAP-APOLLO	
CI06	16MM	|	D3	D3	2ND JAP-APOLLO	
CI07	16MM	|	D3	D3	2ND JAP-APOLLO	
CI08	16MM	|	D3	D3	3RD JAP-APOLLO	
CI09	16MM	|	D3	SOYUZ	USSR-2ND JAP	
CI10	16MM	|	D3	SOYUZ	USSR-2ND JAP	
CI11	16MM	|	D3	SOYUZ	USSR-2ND JAP	
CI12	16MM	|	D3	SOYUZ	USSR-3RD JAP	
CI25	16MM	|	D3	D3	SCIENCE DEMO	
CI26	16MM	|	D3	D3	SCIENCE DEMO	
CI27	16MM	|	D3	D3	SCIENCE DEMO	
CI28	16MM	|	D3	D3	FISH EXPT	|
CI13	35MM	60FR	CAM/B2	B2		SAM-ZFF
CI14	35MM	|	B2	B2		CRYSTAL
CI15	35MM	|	B2	B2		PAO
CI16	35MM	|	B5	B5		PAO
CI17	35MM	|	B5	B5		PAO
CI18	35MM	|	B5	B5		PAO
CI19	35MM	|	B5	B5		PAO
CI20	35MM	|	B5	B5		PAO
CI21	35MM	|	B5	B5		PAO
CI22	35MM	|	B5	B5		PAO |
CS01	16MM	140'	B5	B5	1ST JAP-SOYUZ	
CS02	16MM	140'	B5	B5	1ST JAP-SOYUZ	
CS03	35MM	60FR	B5	B5	SOYUZ DOC*	|

* IN CASE OF FLASH FAILURE \|

MAG ID	MAG TYPE	FOOTAGE /FRAMES	LOC LNCH	LOC NTRY	ACTIVITY DED	ACTIVITY NON-DED
CX01	16MM	140'	CAM/B3	B5	TD&E	
CX02	16MM	140'	B5	B5	DOCK	
CX03	16MM	140'	B5	D3	TEST DOCK/UNDK	
CX04	16MM	140'	B5	B5	SOYUZ PHOTOS	
CX05	16MM	140'	D3	CAM/B3	ENTRY	
CX06	HRC	70FR	CAM/B5	B5		PAO
CX07	HRC	70FR	B5	B5		PAO
CX08	HRC	70FR	B5	B5		PAO
CX09	HRC	70FR	B5	CAM/B5		PAO
CX10	HRC	70FR	U1	U1		EARTH OB
CX11	HRC	70FR	A6	U1		EARTH OB
CX12	HRC	70FR	A6	U1		EARTH OB
CX13	HDC	170FR	U1	U1		EARTH OB
CX14	HRC	70FR	A6	A6		EARTH OB
CX15	HRC	70FR	A6	A6		EARTH OB
CX16	HRC	70FR	A6	A6		EARTH OB
CX17	HRC	70FR	A6	A6		EARTH OB
CX18	35MM	60FR	B2	CAM/B2		DOC
CX19	HDC	170FR	U1	U1	ELECTROPHOR**	
CX20	HDC	170FR	U1	U1	ELECTROPHOR**	
CT01	16MM	125'	D3	D3	EARTH/DM JETT	
CT02	HDC	170FR	CAM/B3	A6	EARTH OB	
CT03	HDC	170FR	A6	A6	EARTH OB	
CT04	HDC	170FR	A6	A6	EARTH OB	
CT05	HDC	170FR	A6	A6	EARTH OB	
CT06	HDC	170FR	U1	U1	EARTH OB	
CT09	16MM	125'	B5	B5	SOLAR ECLIPSE	
IR01	HRC	70FR	U1	U1	SAM	
IR02	HRC	70FR	U1	U1	SAM	
IF01	HRC	70FR	A6	A6	EARTH OB	
IF02	HRC	70FR	A6	CAM/B3	EARTH OB	

** 60 FR EA AVAILABLE FOR EARTH OB

THIS PAGE INTENTIONALLY BLANK

2.0 JOINT PHOTO REQUIREMENTS

A general list of scenes agreed to by both sides appears in document 40010. The detailed requirements are included in this section as negotiated in the Apr,75 joint meeting and as signed off in document 40600.

JOINT
PHOTO REQTS

BACK

COLOR_____

2-2

DATE 6/23/75

USA PHOTO REQTS - IN APOLLO

PHOTO #	GET	ACTIVITY	LOC/ CAM /LENS	DUR (MIN:SEC) OR # FR	OPR
1.1	55:56	INITIAL GREETINGS	874*/DAC02/5mm	4:00	DP
2.1	70:35	SC ENTERS CM	606/DAC01/5mm	4:00	DP
2.2	70:54	CM TOUR	606/DAC01/5mm	2:00	DP
2.2.1	71:20	PLAQUE JOINING	606/DAC01/5mm	0:30	DP
2.3	72:25	EARTH OBSERVATIONS-AC & SC	11/DAC01/5mm	1:00	SC
2.4	73:19	SC USING EXERCISER	HH/DAC02/10mm	0:30	AC
2.5	73:50	MEAL	606/DAC01/5mm	2:00	DP
2.6	74:57	FURNACE OPS	857/DAC02/5mm	2:00	SC
3.1	77:10	PRESS CONFERENCE	606/DAC01/5mm	2:00	DP
3.2	77:54	MICROBIAL - FE BY DP	606/DAC01/5mm	1:00	CP

* If DAC-TO-TV VIBRATION TEST is successful; otherwise, 857.

USA PHOTO REQTS - IN SOYUZ

PHOTO #	GET	ACTIVITY	LOC/ CAM /LENS	DUR (MIN:SEC) OR # FR	OPR
1.2S	55:53	SIGNING OF DOCKING CERT.	TA1/DAC01/5mm	1:00	DP
1.3S	55:59	SIGNING OF DOCKING CERT.	NK	4 FR	AC
1.4S	56:10	MEAL	TA1/DAC01/5mm	1:00	DP
1.5S	56:12	PANORAMA OF OM	HH/DAC01/5mm	2:00	DP
1.6S	56:17	MEAL	NK	8-10 FR	ALL
2.1S	71:08	TOUR OF DV	NK	8-10 FR	CP
2.2S	71:26	JOINING OF PLAQUE	NK	2 FR	CP
2.3S	71:48	CP USING EXERCISER	NK	2 FR	FE
2.4S	72:35	FE DOING EARTH OBSERVATIONS	NK	2 FR	CP
2.5S	73:25	FE PREPARING FOOD	NK	2 FR	CP
3.1S	77:40	PRESS CONFERENCE	NK	2 FR	AC
3.2S	77:41	PRESS CONFERENCE	NK	2 FR	SC
3.3S	78:13	MICROBIAL - SOYUZ BY SC	NK	3 FR	AC
3.4S	78:23	AC DOING EARTH OBSERVATIONS	NK	2 FR	SC
3.5S	78:47	EXCHANGE OF SEEDS	NK	2 FR	AC

USSR PHOTO REQTS - IN APOLLO

PHOTO #	GET	ACTIVITY	LOC/ CAM /LENS	DUR (MIN:SEC) OR # FR	OPR
8.1A	70:35	SC ENTERS CM	231/DAC02/10mm	2:00	DP
8.2A	70:38	DP WELCOMES SC	HH/DAC02/10mm	0:30	SC
8.3A	70:56	CM TOUR	FK-6	2-3 FR	DP
8.3.1A	71:12	CM TOUR & AC	HH/DAC02/10mm	0:30	SC
8.4A	71:17	CM TOUR & SC	HH/DAC02/10mm	0:30	AC
8.5A	71:41	PREPARING FOR GROUND TOUR	11/DAC01/5mm	1:00	SC
8.6A	71:43	PREPARING FOR GROUND TOUR	HH/DAC02/10mm	0:20	SC
8.7A	71:45	PREPARING FOR GROUND TOUR	FK-6	2-3 FR	SC
8.8A	72:02	SOYUZ THRU CM2 WINDOW	HH/DAC02/10mm	1:00	SC
8.9A	72:04	SOYUZ THRU CM2 WINDOW	FK-6	6-8 FR	SC
8.10A	72:37	AC & SC LOOKING OUT CM3	FK-6	3-4 FR	DP
8.11A	74:11	MEAL	607/DAC02/10mm	0:20	SC
8.12A	74:33	MEAL	HH/DAC02/10mm	0:30	SC
8.13A	74:35	MEAL	HH/DAC02/10mm	0:30	DP
8.14A	74:18	MEAL	FK-6	3-4 FR	DP
8.15A	74:20	MEAL	FK-6	3-4 FR	SC
8.16A	74:56	FURNACE OPS - AC	FK-6	2-3 FR	SC
8.17A	75:02	FURNACE OPS - AC & SC	872/DAC01/5mm	2:00	AC
9.1A	75:06	AC & SC IN DM	FK-6	3-4 FR	DP
9.2A	75:46	SC XFERS SAMPLES TO OM	872/DAC01/5mm	2:00	SC
9.3A	76:49	CP FIXES HOSES IN TUNNEL	FK-6	3-4 FR	FE
9.4A	77:19	PRESS CONFERENCE	607/DAC01/10mm	2:00	FE
9.5A	77:30	PRESS CONFERENCE	FK-6	2 FR	FE
9.6A	77:59	MICROBIAL - FE BY DP	FK-6	2-3 FR	CP
9.7A	77:51	MICROBIAL - CP BY DP	607/DAC01/10mm	2:00	FE
9.8A	77:52	MICROBIAL - CP BY DP	FK-6	2-3 FR	FE
9.9A	78:45	GIFT EXCHANGE - SIGNING	FK-6	3-4 FR	CP

USSR PHOTO REQTS - IN SOYUZ (1ST JOINT PERIOD)

PHOTO #	GET	ACTIVITY	LOC/ CAM /LENS	DUR (MIN:SEC) OR # FR	OPR
7.1	54:48	SC OPENS HATCH 4	TA2/16KM/10mm	0:25	FE
7.2	54:56	INITIAL GREETINGS	TA2/16KM/10mm	0:25	SC
7.3	54:56	INITIAL GREETINGS	HH/K-3A/12.5mm	0:20	FE
7.4	54:56	INITIAL GREETINGS	HH/K-3A/20mm	0:15	FE
7.5	54:59	INITIAL GREETINGS	TA2/16KM/10mm	1:10	FE
		INITIAL GREETINGS	FK-6	2-3 FR	FE
7.6	55:12	GIFT EXCHANGE	K1/16KM/10mm	2:00	SC
		GIFT EXCHANGE	FK-6	6 FR	SC
7.7	55:13	CLOSEUP OF GIFTS	HH/K-3A/12.5mm	0:20	FE
7.8	55:25	DP CONNECTS CABLES	HH/K-3A/12.5mm	0:20	SC
7.9	55:32	AC CONNECTS INTERCOM	HH/K-3A/20mm	0:20	SC
7.10	55:54	SIGNING OF DOCKING CERT.	K1/16KM/10mm	1:00	FE
		SIGNING OF DOCKING CERT.	HH/K-3A/12.5mm	0:30	FE
7.11.1	56:05	MEAL	K1/16KM/10mm	0:30	FE
7.11.2	56:18	MEAL	K3/16KM/10mm	0:30	SC
7.11.3	56:25	MEAL	HH/K-3A/20mm	0:15	SC
		MEAL	FK-6	2-3 FR	SC
7.12	56:34	MEAL	FK-6	4 FR	FE
7.13	56:37	SC XFERS EXPT EQUIP TO AC	K3/16KM/10mm	0:30	FE
7.14	56:38	SC XFERS EXPT EQUIP TO AC	HH/K-3A/12.5mm	0:20	FE
7.15	56:41	AC XFERS ZFF EQUIP TO SC	HH/K-3A/20mm	0:15	FE
7.16	56:42	AC XFERS ZFF EQUIP TO SC	FK-6	4 FR	FE
7.17	56:54	DP & FE XFER TO DM	FK-6	4 FR	SC
7.18	57:10	AC,DP PREPARE TO XFER	T3/16KM/10mm	0:30	SC
7.19	57:10	AC XFERS TO DM	FK-6	4 FR	FE
7.20	57:12	AC,DP IN DM NEAR HATCH 3	FK-6	4 FR	FE
7.21	57:15	FE CLOSES HATCH 4	HH/K-3A/12.5mm	0:20	SC
7.22	57:16	FE CLOSES HATCH 4	HH/K-3A/20mm	0:20	SC
7.23	57:40	FE OPERATES ZFF	HH/K-3A/12.5mm	0:20	SC
7.24	57:40	FE OPERATES ZFF	HH/K-3A/12.5mm	0:20	SC

USSR PHOTO REQTS - IN SOYUZ (2ND & 3RD JOINT PERIODS)

PHOTO #	GET	ACTIVITY	LOC/ CAM/LENS	DUR (MIN:SEC) OR # FR	OPR
8.1	69:34	CP XFERS TO OM	TA1/16KM/10mm	0:30	SC
8.2	69:48	SC XFERS TO DM	TA1/16KM/10mm	0:30	FE
8.3	70:30	FE UNSTOWS ZFF	K3/16KM/10mm	0:30	FE
8.4	70:32	FE PERFORMS ZFF	HH/K-3A/20mm	0:20	CP
8.5	71:26	CP EXERCISES	K1/16KM/10mm	0:30	FE
8.6	71:31	CP EXERCISES	HH/K-3A/12.5mm	0:30	FE
8.7	71:34	CP EXERCISES	HH/K-3A/20mm	0:20	FE
8.8	72:56	SCIENCE DEMONSTRATION	K1/16KM/10mm	2:00	FE
8.9	73:02	SCIENCE DEMONSTRATION	HH/K-3A/12.5mm	0:25	FE
8.10	73:09	SCIENCE DEMONSTRATION	HH/K-3A/20mm	0:20	FE
8.11	73:13	SCIENCE DEMONSTRATION	HH/K-3A/12.5mm	0:20	FE
9.1	76:17	SC CHECKS HATCH 3 & 4	K2/16KM/10mm	0:30	SC
9.2	76:18	SC CHECKS HATCH 3 & 4	HH/K-3A/12.5mm	0:20	AC
9.3	76:19	SC OPERATES PRESS CONTROLS	HH/K-3A/20mm	0:15	AC
9.4	77:36	PRESS CONFERENCE - AC & SC	K1/16KM/10mm	1:00	SC
9.5	77:38	PRESS CONFERENCE - AC	HH/K-3A/20mm	0:20	SC
9.6	77:39	PRESS CONFERENCE - SC	HH/K-3A/20mm	0:20	AC
9.7	78:40	SEED EXCHANGE	K1/16KM/10mm	0:30	SC
9.8	78:41	SEED EXCHANGE	HH/K-3A/12.5mm	0:35	SC
10.1	79:35	DP XFER EQUIPMENT TO OM	TA1/16KM/10mm	0:30	SC
10.2	79:46	MICROBIAL - SC BY DP	HH/K-3A/12.5mm	0:20	AC
10.3	79:47	MICROBIAL - AC BY DP	HH/K-3A/12.5mm	0:20	SC
10.4	79:47	MICROBIAL - AC BY DP	HH/K-3A/20mm	0:20	SC
10.5	79:54	FE XFER TO OM	TA1/16KM/10mm	0:30	SC
10.6	80:04	AC DISCONNECTS CABLES	HH/K-3A/12.5mm	0:20	SC
10.7	80:04	AC DISCONNECTS CABLES	HH/K-3A/20mm	0:20	SC
10.8	80:24	AC XFER TO DM	TA2/16KM/10mm	1:00	SC

3.0 JOINT PROCEDURES

This section is being omitted in the flight book since these procedures appear in two other places in the FDF: the Joint Ops C/L and the cue cards.

THIS PAGE INTENTIONALLY BLANK

4.0 SOLO PHOTO REQUIREMENTS

SOLO
PHOTO REQTS

SOLO PHOTO REQTS									
ACTIVITY	CAMERA	LENS	LOC	FILM TYPE	PERFs	FT/FR PER PERF	TOTAL FILM USED	FRAME RATE	REMARKS
EXPTS									
SAM(MA007)	HRC	250mm	CM5	IR	2	36 FR(1) 12 FR(1)	48 FR	1 FR/ 2.5 SEC	
	NK	35mm	HH	CI	1	6 FR	6 FR		
ELECTROPHOR-ESIS(MA011)	HDC	80mm	*	CX	8	30 FR(6) 20 FR(2)	220 FR	1 FR/ 180 SEC	*CAM MOUNT-ED TO EXPT
CRYSTAL (MA028)	NK	35mm	HH*	CI	10	4 FR	40 FR	-	*USES FRAM-ING DEVICE
DOPPLER (MA089)	DAC	75mm	CM4	CT	1	15'	15'	2FPS	
EARTH OBS (MA136)	HDC	100mm	CM5	CT CX	-	-	5 MAG 1 MAG	-	
	HRC	250mm 50mm	HH	CX IF			7 MAG 2 MAG		
	DAC	25mm 75mm	HH	CT	1	33'	33'	2FPS	
ZFF(MA147)	NK	35mm	HH	CI	18	2 FR	36 FR	-	
FISH	DAC	10mm	874*	CI	3	30'	90'	12 FPS	*HH ON DAY2
PAO									
TD&E	DAC	25mm	CM2	CX	1	140'	140'	12 FPS	
	HRC	50mm	CM2	CX	1	-	-	-	
DM JETT	DAC	75mm	CM4	CT	1	55'	55'	2&12FPS	
ENTRY	DAC	10mm	CM2	CX	1	140'	140'	12FPS	

BACK

COLOR

4-2

DATE 6/23/75

FUSES

CHANGE FUSES (if reqd) by opening battery compartment door, removing bad fuse, and replacing with fuse from spare fuse holder.

5.3.4 VARIABLE INTERVALOMETER

1. ATTACH INTERVALOMETER to the HDC or HRC accessory connectors on the side of the battery housing. Align cable using blue alignment marks, insert and rotate CW.

2. SELECT TIMING INTERVAL from data in C/L. Available selections are 2.5, 6.25, 10, and 180 sec. (TEST position is for ground use only.)

3. TURN INTERVALOMETER ON. Camera will cycle as soon as IVL is turned on and thereafter at the interval selected.

4. IF IVL IS IN GROUND TEST POSITION and then turned on, camera may cycle immediately (one time only).

HASSELBLAD TM CABLE

ATTACH CABLE to either HDC or HRC connector, then to pnl 227 (SCI INSTR PWR). If a strip is desired, attach third connector to IVL and operate IVL normally. Verify SCI PWR is on.

5.3.5 EARTH OBSERVATION HASSELBLAD MOUNT

MOUNT BRKT in RH side window receptacle. Either HDC or HRC may be attached.

EXTERIOR PHOTOS

EXTERIOR PHOTOS

A. HRC with 250mm lens:
Use with CX film only - 1/500 sec

SUN ANGLE	GENERAL	DESERT/ CLOUDS	VEGETATION	JUNGLE
90-30 deg	f8	f11	f5.6	***
30-15 deg	f5.6	f8	***	---
15-10 deg	***	f5.6	---	---
10-5 deg	---	***	---	---

*** - f5.6 at 1/250 sec

B. HRC with 50mm lens:
Use with CX film only - 1/250 sec

SUN ANGLE	GENERAL	DESERT/ CLOUDS	VEGETATION	JUNGLE
90-30 deg	f11	f16	f8	f5.6
30-15 deg	f8	f11	f5.6	f4
15-10 deg	f5.6	f8	f4	---
10-5 deg	f4	f5.6	---	---

C. HDC with 100mm lens:
Use with CX film only - 1/250 sec

SUN ANGLE	GENERAL	DESERT/ CLOUDS	VEGETATION	JUNGLE
90-30 deg	f11	f16	f8	f5.6
30-15 deg	f8	f11	f5.6	f4
15-10 deg	f5.6	f8	f4	f3.5
10-5 deg	f4	f5.6	f3.5	---

D. HDC with 60mm lens:
Use with CX film only - 1/250 sec

SUN ANGLE	GENERAL	DESERT/ CLOUDS	VEGETATION	JUNGLE
90-30 deg	f8	f11	f5.6	***
30-15 deg	f5.6	f8	***	---
15-10 deg	***	f5.6	---	---
10-5 deg	---	***	---	---

*** - f5.6 at 1/250 sec

SUNRISE/SUNSET
EARTH LIMB (f6.7 +/- 1 stop,1/125,INF)

MOONSET (f8 +/- 1/2 stop,1/250,INF)

FILM TYPE	ASA	NO. ROLLS (EXP/ROLL)	USE
CX	64	HRC:11(70)	7 - EARTH OBS 4 - PAO
		HDC:1 (170) 2 (60)	EARTH OBS
CT	12	HDC:5 (170)	EARTH OBS
IF	100	HRC:2 (70)	EARTH OBS

PROCEDURES:
1. Make settings from proper table - DO NOT USE SPOTMETER
2. Use shutter speed of 1/500 for 250mm lens, 1/250 for other lenses
3. Film counter counts up

OTHER COMMENTS:

-JUNGLE: Tropical rain forest areas with dense vegetation - Try for near vertical photos

-OCEANS: Use GENERAL settings for surface and VEGETATION settings for sub-surface

-TROPICAL STORMS: Use DESERT/CLOUDS settings, but increase fstop by one full stop (e.g.f11 to f16) at all sun angles except 10-5 deg

-ALL: Avoid highly oblique photos at full open lens apertures, unless haze or pollution is the subject

FILM AVAILABLE - EXTERNAL

HRC-CX06	CX10	CX15	IF01	HDC-CT02	CT06
CX07	CX11	CX16	IF02	CT03	CX13
CX08	CX12	CX17		CT04	*CX19
CX09	CX14			CT05	*CX20
				*60 FR EA	

THIS PAGE INTENTIONALLY BLANK

10.0 INSTRUCTIONS FOR ALTERNATE LAUNCH OPPORTUNITIES

The following list of joint photo items (as contained in the Joint Photo Cue Cards) are to be performed on the 4th and 5th launch opportunities. The remaining items are to be deleted from the cards.

4TH OPP: 1.2S
1.3S
1.4S
1.5S
1.6S

2.1
8.1A
8.2A
8.3A
8.4A
2.2.1

9.9A

8.4
2.2S

3.3S
3.5S

5TH OPP: 1.2S (8.1A and 8.2A are included
1.3S in the transfer procedures)
1.4S
1.5S
1.6S

8.4
2.2S

THIS PAGE INTENTIONALLY BLANK