ASTP

JSC-09144

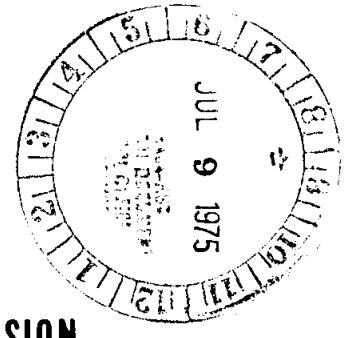
FINAL

REVISION A

PCN-1

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

JOINT OPERATIONS CHECKLIST



PREPARED BY
PROCEDURES BRANCH
CREW TRAINING & PROCEDURES DIVISION

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

JULY 1, 1975

ASTP
JOINT OPERATIONS CHECKLIST

JSC-09144
PA-N6-11170-2

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It is requested that any organization having comments, questions or suggestions concerning this document contact Dan A. Bland, Jr. or Robert R. Kain, CG2, Bldg. 4, ext. 4794.

This document is under the 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.

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ACKNOWLEDGMENTS

SECTIONS	NAME	LOCATION
J1-1 through J1-4	S. P. Grega, CT&PD	Rm 211,Bldg.4
J2-1 through J2-26	S. P. Grega, CT&PD	Rm 211,Bldg.4
J3-1 through J3-8	S. P. Grega, CT&PD	Rm 211,Bldg.4
J4-1 through J4-2	S. P. Grega, CT&PD	Rm 211,Bldg.4
J5-1 through J5-3	S. P. Grega, CT&PD	Rm 211,Bldg.4
J6-1 through J6-2	S. P. Grega, CT&PD	Rm 211,Bldg.4
J7-1 through J7-11	G. L. Shinkle, CT&PD	Rm 215,Bldg.4
J8-1 through J8-5	D. R. Brooks, CT&PD	Rm 220,Bldg.4
J9-1 through J9-3	R. L. Hahne, CT&PD	Rm 220,Bldg.4
J10-1 through J10-7	R. H. Nute, CT&PD	Rm 216,Bldg.4
General	B. A. Levy, TRW	Rm 256,Bldg.4

CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT — JOINT OPERATIONS — CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
001			DISAPPROVED
002	ASTP, FINAL	6/2/75	
003			SUPERCEDED BY 003A
003A	ASTP, FINAL	6/2/75	
004			DISAPPROVED
005	ASTP, FINAL	6/2/75	
006	ASTP, FINAL, REV A	6/25/75	
007	ASTP, FINAL, REV A	6/25/75	
008	ASTP, FINAL, REV A	6/25/75	
009	ASTP, FINAL, REV A	6/25/75	
010	ASTP, FINAL, REV A	6/25/75	
011	ASTP, FINAL, REV A, PCN-1	7/1/75	
012	ASTP, FINAL, REV A, PCN-1	7/1/75	

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

ASTP

JOINT OPERATIONS CHECKLIST

LIST OF EFFECTIVE PAGES

TRAINING 3/25/74
REVISION 8/29/74
REFERENCE 3/31/75
FINAL 6/2/75
REVISION A 6/25/75
PCN-1 7/1/75

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*ii	7/1/75	J/2-17	6/25/75
*iii	7/1/75	*J/2-18	7/1/75
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*Current Change

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*J/10-8	7/1/75
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*Current Change

JOINT OPERATIONS CHECKLIST

CONTENTS

DATE 7/1/75

ASTP 40600

J
1-1

DOCKING SYSTEM CHECKOUT


```
* * * * * * * *  CAUTION  * * * * * * * * * *
* GUIDE RING-EXTD/RETR MUST BE OPERATED      *
* BY SYSTEM A OR B ONLY (SINGLE MOTOR).      *
* DYNAMIC FORCES USING TWO MOTORS COULD      *
* CREATE STRUCTURAL LOADS BEYOND             *
* DESIGN LIMITS.                             *
*                                            *
* STRUCT LATCH-CLOSE/OPEN MUST BE OPERATED   *
* BY SYSTEM A OR B ONLY (SINGLE MOTOR).      *
* STALLED GEAR BOX LOAD USING TWO            *
* MOTORS COULD EXCEED CABLE BREAKING         *
* STRENGTH.                                  *
*                                            *
* MCC MAY ADVISE THAT MOTORS IN BOTH         *
* SYSTEMS ARE DEGRADED. THEREFORE,           *
* BOTH SYSTEMS (A&B) MAY BE OPERATED         *
* SIMULTANEOUSLY.                            *
* * * * * * * * * * * * * * * * * * * * * * *
```

PNL

NOTE

3 MONITOR FC 1 OR 2(SYSTEM A) OR FC 3 (SYSTEM B) CURRENT WHEN OPERATING STRUCT LATCH, GUIDE RING, OR BACKUP PASSIVE MOTORS.

DATE 6/25/75

```
* IF SYSTEM B MOTORS REQUIRED:              *
* CB MAIN B BAT BUS B-CLOSE(VERIFY)          *
* MAIN BUS TIE B/C-ON(UP)                    *
*                                            *
* IF SYSTEM A&B MOTORS REQUIRED:             *
* MAIN BUS TIE (2)-ON(UP)                    *
*                                            *
* TO AVOID EXCESS CURRENT DRAIN              *
* ON ENTRY BATTERIES:                        *
* MAIN BUS TIE (2)-OFF(DN)                   *
* AFTER SYSTEM TASK PERFORMED.               *
```

275
5

-30:00

1. CM4/NK(B2)/300MM-EYEPIECE(A5)
LENS BRKT(A5) / DAC MOUNT(U1)

ASTP 40600

DOCKING SYSTEM CHECKOUT

J
1-2

2. 2 GUIDE RING A&B-OFF(VERIFY)
CAPTURE LATCH RELEASE A&B-OFF(VERIFY)
STRUCT LATCH A&B-OFF(VERIFY)
BACKUP PASSIVE A&B-OFF(VERIFY)

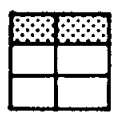
274 CB IND LOGIC MNA&MNB-OPEN
CB IND PWR AC1&AC2-OPEN
CB CONTROL BAT A&B-OPEN
CB MOTORS AC1(3) & AC2(3)-OPEN

MCC WILL ADVISE WHEN TO ACTIVATE
THE CB'S AND EXTEND/RETRACT
GUIDE RING.

3. 274 CB IND PWR AC1-CLOSE

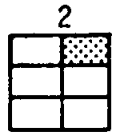
2 DOCKING LTS(6)-OUT(VERIFY)
DOCKING PB(6)-PUSH SEQUENTIALLY
DOCKING LT(6)-ON/OUT(VERIFY)

274 CB IND LOGIC MNA-CLOSE
CB CONTROL BAT A-CLOSE
CB MOTORS AC1(3)-CLOSE
CB DM POWER(2)-CLOSE(VERIFY)


STRUCT LATCH OPEN LT-ON
PASSIVE LT-ON

4. ROTATE CAMERA TO PLACE SMALLEST VISIBLE
LINE ON TARGET IN THE RANGEFINGER.
FOCUS CAMERA (FROM LOW END OF LENS SCALE)
AND RECORD RANGE.

WARNING: DO NOT DISTURB CAMERA UNTIL
GUIDE RING IS EXTENDED.

* *
5. * IF STRUCT LATCH OPEN LT-OUT: *
2 * STRUCT LATCH A-OPEN(~8 SEC) *

* STRUCT LATCH OPEN LT-ON *
* STRUCT LATCH A-OFF(CTR) *
* *

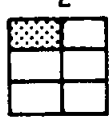
DATE 6/25/75

ASTP 40600

J
1-3

PNL

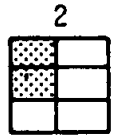
6. 2



```
* * * * * * * * * * * * * * * * * * * * *
* IF PASSIVE LT-OUT:                     *
* GUIDE RING A-RETRACT(~40 SEC)          *
* PASSIVE LT-ON                          *
* GUIDE RING A-OFF                       *
* * * * * * * * * * * * * * * * * * * * *
```

IF CHECKING SYSTEM B, GO TO STEP 9:

7. 2



GUIDE RING A-EXTND (~40 SEC)
PASSIVE LT-OUT
GUIDE RING EXTEND LT-ON

GUIDE RING A-OFF(CTR)

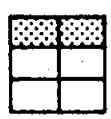
FOCUS CAMERA (FROM LOW END OF LENS SCALE) ON THE SAME LINE AND RECORD RANGE.

RANGE AT EXTENSION _____

RANGE AT RETRACTION _____

DISTANCE EXTENDED _____

COMPUTE GUIDE RING EXTENSION DISTANCE (RANGE AT EXTENSION MINUS RANGE AT RETRACTION).



GUIDE RING A-RETRACT (~40 SEC)
GUIDE RING EXTD LT-OFF
PASSIVE LT-ON

GUIDE RING A-OFF (CTR)

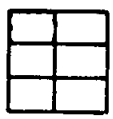
DATE 6/25/75

ASTP 40600

J
1-4

PNL

8. 274 CB IND LOGIC MNA-OPEN



STRUCT LATCH OPEN LT-OUT
PASSIVE LT-OUT

274 CB IND PWR AC1-OPEN

275 CB MAIN A BAT BUS A-CLOSE(VERIFY)
CB MAIN B BAT BUS B-CLOSE(VERIFY)

VERIFY SYSTEM B STARTING AT STEP 2:

9. DOCKING SYSTEM A:
274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN(VERIFY)
CB MOTORS AC1(3)-OPEN(VERIFY)

DOCKING SYSTEM B:
CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN(VERIFY)
CB MOTORS AC2(3)-OPEN(VERIFY)

5 MAIN BUS TIE B/C-OFF(VERIFY)

RESTOW CAMERA ASSEMBLY COMPONENTS

DATE 6/25/75

J
2-1

APOLLO ACTIVE APDS

APOLLO ACTIVE DOCKING

REF. DOCK/UNDOCK

```
* * * * * * * * CAUTION * * * * * * * * * *
* GUIDE RING-EXTD/RETR MUST BE OPERATED     *
* BY SYSTEM A OR B ONLY (SINGLE MOTOR).     *
* DYNAMIC FORCES USING TWO MOTORS COULD     *
* CREATE STRUCTURAL LOADS BEYOND            *
* DESIGN LIMITS.                            *
*                                           *
* STRUCT LATCH-CLOSE/OPEN MUST BE OPERATED  *
* BY SYSTEM A OR B ONLY (SINGLE MOTOR).     *
* STALLED GEAR BOX LOAD USING TWO           *
* MOTORS COULD EXCEED CABLE BREAKING        *
* STRENGTH.                                 *
*                                           *
* MCC MAY ADVISE THAT MOTORS IN BOTH        *
* SYSTEMS ARE DEGRADED. THEREFORE,          *
* BOTH SYSTEMS (A&B) MAY BE OPERATED        *
* SIMULTANEOUSLY.                           *
* * * * * * * * * * * * * * * * * * * * * *
```

DATE 6/25/75

PNL

NOTE

3 MONITOR FC 1 OR 2(SYSTEM A) OR FC 3 (SYSTEM B) CURRENT WHEN OPERATING STRUCT LATCH, GUIDE RING, OR BACKUP PASSIVE MOTORS.

```
      * IF SYSTEM B MOTORS REQUIRED:        *
275   *  CB MAIN B BAT BUS B-CLOSE(VERIFY)  *
  5   *  MAIN BUS TIE B/C-ON(UP)            *
      *                                     *
      * IF SYSTEM A&B MOTORS REQUIRED:      *
      *  MAIN BUS TIE (2)-ON(UP)            *
      *                                     *
      * TO AVOID EXCESS CURRENT DRAIN       *
      * ON ENTRY BATTERIES:                 *
      *  MAIN BUS TIE (2)-OFF(DN)           *
      * AFTER SYSTEM TASK PERFORMED.        *
```

PNL

REF. DOCK/UNDOCK

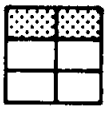
DOCKING SYSTEM PREPARATION:

DOCKING SYSTEM A:

274
- CB IND LOGIC MNA-CLOSE
- CB IND PWR AC1-CLOSE
- CB CONTROL BAT A-CLOSE
- CB MOTORS AC1(3)-CLOSE
- CB DM POWER (2)-CLOSE(VERIFY)

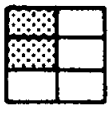
DOCKING SYSTEM B:

274
- CB IND LOGIC MNB-CLOSE
- CB IND PWR AC2-CLOSE
- CB CONTROL BAT B-CLOSE
- CB MOTORS AC2(3)-CLOSE



STRUCT LATCH OPEN LT-ON(VERIFY)
PASSIVE LT-ON(VERIFY)

GUIDE RING A-EXTD(~40 SEC)(MAY CAUSE JET FIRINGS)



PASSIVE LT - OUT
GUIDE RING EXTD LT-ON

GUIDE RING A-OFF(CTR)

◄INFORM SOYUZ : READY FOR DOCKING.
ARE YOU READY?

INFORM APOLLO : READY FOR DOCKING.

◄INFORM SOYUZ : APPROACHING SOYUZ.

TO INITIATE APPROACH:

* IF NO COMM BETWEEN SPACECRAFT AND SOYUZ WISHES TO TERMINATE APOLLO APPROACH: SOYUZ WILL TURN ON BEACON LTS FOR 10 SEC, THEN OFF (TWICE) *

DATE 6/25/75

J
2-3

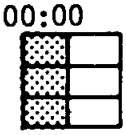
PNL
1
-05:00 VERIFY DOCKING ATTITUDE
EMS MODE-NORMAL
THC-THRUST +X (4 JET)(ΔVC=-100.5 FPS)
THC/RHC-MAINTAIN RELATIVE ALIGNMENT
(CLOSING ΔV=0.5 FPS)

AT CONTACT:

◄INFORM SOYUZ : CONTACT.

INFORM APOLLO : CONTACT.

00:00 THC-THRUST +X (4 JET) AT CONTACT FOR 5 SEC MAX.
GUIDE RING CAPTURE LT-ON(CAPTURE LT MAY BLINK)
OR WHEN SOYUZ REPORTS CAPTURE



```
* IF SCS CONTROL REQD:                *
* MAN ATT(3)-MIN IMP                  *
*   (<2 SEC AFTER CAPTURE)            *
* AUTO RCS SELECT : A3,C4,B3,D4-OFF   *
*                 : B/D ROLL(4)-OFF   *
* DBD/RATE-MIN/HI                     *
* BMAG MODE(3)-ATT 1/RATE 2           *
* MAN ATT(3)-RATE CMD                 *
* SC CONT-SCS                         *
```

1 SC CONT-CMC/FREE (<2 SEC AFTER CAPTURE)
8 AUTO RCS SELECT : A3,C4,B3,D4-OFF
1 SC CONT-CMC/AUTO

◄INFORM SOYUZ : CAPTURE.

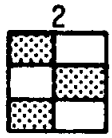
INFORM APOLLO : CAPTURE.

WAIT FOR SPACECRAFT TO STABILIZE(~2 MIN)

◄INFORM SOYUZ : INITIATING RETRACTION.

DATE 6/25/75

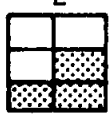
PNL 2



TO RETRACT:

GUIDE RING A-RETRACT(~40 SEC)
GUIDE RING EXTD LT-OUT
STRUCT RING CONTACT LT-ON
(WAIT 2 SEC)
GUIDE RING A-OFF(CTR)

2



TO PRELOAD STRUCTURAL LATCHES:

STRUCT LATCH A-CLOSE(~8 SEC)
STRUCT LATCH OPEN LT-OUT
STRUCT LATCH CLOSE LT-ON(LT MAY FLICKER)

STRUCT LATCH A-OFF(CTR)

◄INFORM SOYUZ : DOCKING COMPLETED.

INFORM APOLLO : INTERFACE SEAL COMPRESSED.
SOYUZ SYSTEM CHECK

PERFORM STANDARD APOLLO DOCKED CONFIGURATION CHECKLIST(J/5-1)

DATE 6/25/75

J
2-5

APOLLO ACTIVE UNDOCKING

PNL

HATCH 3-CLOSED (VERIFY)
HATCH 3 PEV-CLOSED (VERIFY)

V48E(61102,11111)(DO NOT ACTIVATE DAP)

1 EMS FUNC/MODE-ΔVSET/STBY
SET ΔVC=+100.0 FPS
EMS FUNC-ΔV

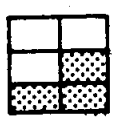
◄INFORM SOYUZ : PREPARING FOR UNDOCKING.

DOCKING SYSTEM PREPARATION:
DOCKING SYSTEM A:
274 CB IND LOGIC MNA-CLOSE
CB IND PWR AC1-CLOSE
CB CONTROL BAT A-CLOSE
CB MOTORS AC1(3)-CLOSE

DOCKING SYSTEM B:
CB IND LOGIC MNB-CLOSE
CB IND PWR AC2-CLOSE
CB CONTROL BAT B-CLOSE
CB MOTORS AC2(3)-CLOSE

DOCKING STATUS LIGHTS:
GUIDE RING CAPTURE LT-ON(VERIFY)
STRUCT RING CONTACT LT-ON(VERIFY)
STRUCT LATCH CLOSE LT-ON(VERIFY)

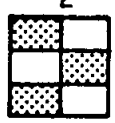
DATE 6/25/75



* IF SOYUZ CLOSED ACTIVE HOOKS: *
* *
* ◄INFORM SOYUZ : OPEN YOUR ACTIVE HOOKS. *
* *
* INFORM APOLLO : ACTIVE HOOKS OPEN. *

J
2-6

PNL
-05:00 ◄INFORM SOYUZ : OPENING ACTIVE HOOKS.

2 STRUCT LATCH A-OPEN(~8 SEC)

STRUCT LATCH CLOSE LT-OUT
STRUCT LATCH OPEN LT-ON

* IF STRUCT LATCH OPEN LT-OUT: *
* USE BU PROCEDURE FOR APOLLO ACTIVE *
* UNDOCKING JOINT OPS CKLT Pg J/3-4 *

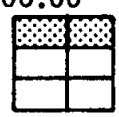
STRUCT LATCH A-OFF(CTR)

-02:00 ◄INFORM SOYUZ : READY FOR UNDOCKING.

INFORM APOLLO : READY FOR UNDOCKING.

TO INITIATE ACTIVE UNDOCKING:
1 EMS MODE-NORMAL

◄INFORM SOYUZ : INITIATING UNDOCKING
5,4,3,2,1 MARK

00:00 CAPTURE LATCH A&B-RELEASE(MOM)

GUIDE RING CAPTURE LT-OUT
PASSIVE LT-ON
STRUCT RING CONTACT LT-OUT

MONITOR UNDOCKING ΔVC=+100.2 FPS

8 AUTO RCS SELECT(16)-MNA/MNB
1 BMAG MODE(3)-ATT1/RATE2
MAN ATT(3)-RATE CMD
SC CONT-SCS
EMS FUNC/MODE-OFF/STBY
V46E(ACTIVATE APOLLO DAP)

DATE 6/25/75

J
2-7

PNL

◄INFORM SOYUZ : UNDOCKING COMPLETED.

INFORM APOLLO : UNDOCKING COMPLETED.

DOCKING SYSTEM A:

274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN
CB MOTORS AC1(3)-OPEN

DOCKING SYSTEM B:

CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN
CB MOTORS AC2(3)-OPEN

5 MAIN BUS TIE (2)-OFF(DN)

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2-9

APOLLO PASSIVE APDS

APOLLO PASSIVE DOCKING

PNL

1 EMS FUNC/MODE-ΔV SET/STBY
SET ΔVC=-100.0 FPS
EMS FUNC-ΔV

MANEUVER TO STATION KEEP ON SOYUZ +X AXIS

◄INFORM SOYUZ : INITIATING ORIENTATION OF APOLLO.

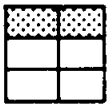
DOCKING SYSTEM PREPARATION:
DOCKING SYSTEM A:

274 CB IND LOGIC MNA-CLOSE
CB IND PWR AC1-CLOSE
CB CONTROL BAT A-CLOSE
CB MOTORS AC1(3)-CLOSE

DOCKING SYSTEM B:
CB IND LOGIC MNB-CLOSE
CB IND PWR AC2-CLOSE
CB CONTROL BAT B-CLOSE
CB MOTORS AC2(3)-CLOSE

2 GUIDE RING A-RETRACT(MAY CAUSE
JET FIRINGS)(VERIFY PASSIVE LT-ON)
GUIDE RING A-OFF(CTR)
STRUCT LATCH A-OPEN(≈8 SEC)(VERIFY OPEN)
STRUCT LATCH A-OFF(CTR)

DOCKING STATUS LIGHTS:
STRUCT LATCH OPEN LT-ON(VERIFY)
PASSIVE LT-ON(VERIFY)



DATE 6/25/75

PNL

◄INFORM SOYUZ : ORIENTATION ESTABLISHED.
READY FOR DOCKING.
ARE YOU READY?

INFORM APOLLO : READY FOR DOCKING.

◄INFORM SOYUZ : APPROACHING SOYUZ.

TO INITIATE APPROACH:

```
      * IF NO COMM BETWEEN SPACECRAFT AND     *
      *  SOYUZ WISHES TO TERMINATE APOLLO     *
      *  APPROACH:  SOYUZ WILL TURN ON BEACON *
      *  LTS FOR 10 SEC, THEN OFF (TWICE)     *
```

VERIFY DOCKING ATTITUDE

1 EMS MODE-NORMAL

-05:00 THC-THRUST +X (4 JET)(ΔVC=-100.5FPS)

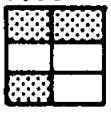
THC/RHC-MAINTAIN RELATIVE ALIGNMENT
(CLOSING ΔV=0.5 FPS)

AT CONTACT:

INFORM APOLLO : CONTACT.

◄INFORM SOYUZ : CONTACT.

00:00 THC-THRUST +X (4 JET) AT CONTACT FOR 5 SEC MAX.



GUIDE RING CAPTURE LT-ON(CAPTURE LT MAY BLINK)
OR WHEN SOYUZ REPORTS CAPTURE

```
      * IF SCS CONTROL REQD:                 *
      *  MAN ATT(3)-MIN IMP                  *
      *    (<2 SEC AFTER CAPTURE)            *
      *  AUTO RCS SELECT : A3,C4,B3,D4-OFF   *
      *                  : B/D ROLL(4)-OFF   *
      *  DBD/RATE-MIN/HI                     *
      *  BMAG MODE(3)-ATT 1/RATE 2           *
      *  MAN ATT(3)-RATE CMD                 *
      *  SC CONT-SCS                         *
```

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1 SC CONT-CMC/FREE (<2 SEC AFTER CAPTURE)

8 AUTO RCS SELECT : A3,C4,B3,D4-OFF

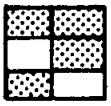
1 SC CONT-CMC/AUTO

INFORM APOLLO : CAPTURE.

◄INFORM SOYUZ : CAPTURE.

INFORM APOLLO : INITIATING RETRACTION.

MONITOR RETRACTION (~6 MIN):
STRUCT RING CONTACT LT-ON



INFORM APOLLO : INTERFACE SEAL COMPRESSED.
DOCKING SYSTEM POWER OFF.

SOYUZ SYSTEM CHECK

◄INFORM SOYUZ : DOCKING COMPLETED.

PERFORM STANDARD APOLLO DOCKED CONFIGURATION CHECKLIST(J/5-1)

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J
2-13

APOLLO PASSIVE UNDOCKING

PNL

HATCH 3-CLOSED (VERIFY)
HATCH 3 PEV-CLOSED (VERIFY)

V48E(61102,11111)(DO NOT ACTIVATE)

1 EMS FUNC/MODE-ΔV SET/STBY
SET ΔVC=+100.0 FPS
EMS FUNC-ΔV

INFORM APOLLO : PREPARING FOR UNDOCKING.

DOCKING SYSTEM PREPARATION:
DOCKING SYSTEM A:
274 CB IND LOGIC MNA-CLOSE
CB IND PWR AC1-CLOSE
CB CONTROL BAT A-CLOSE
CB MOTORS AC1(3)-CLOSE

DOCKING SYSTEM B:
CB IND LOGIC MNB-CLOSE
CB IND PWR AC2-CLOSE
CB CONTROL BAT B-CLOSE
CB MOTORS AC2(3)-CLOSE

* IF ACTIVE HOOKS CLOSED: *
* *
◄INFORM SOYUZ : OPENING ACTIVE HOOKS. *
* *
* STRUCT LATCH A-OPEN(~8 SEC) *
* STRUCT LATCH CLOSE LT-OUT *
* STRUCT LATCH OPEN LT-ON *

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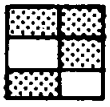
PNL



DOCKING STATUS LIGHTS:
STRUCT LATCH OPEN LT-ON(VERIFY)
GUIDE RING CAPTURE LT-ON(VERIFY)
PASSIVE LT-ON(VERIFY)
STRUCT RING CONTACT LT-ON(VERIFY)

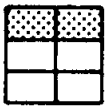
INFORM APOLLO : READY FOR UNDOCKING.

INFORM SOYUZ : READY FOR UNDOCKING.

INFORM APOLLO : INITIATING UNDOCKING.

EMS MODE-NORMAL
MONITOR PASSIVE UNDOCKING

AT UNDOCKING:



GUIDE RING CAPTURE LT-OUT
STRUCT RING CONTACT LT-OUT

MONITOR UNDOCKING ΔVC=+100.2 FPS

8 AUTO RCS SELECT(16)-MNA/MNB
1 BMAG MODE(3)-ATT1/RATE2
MAN ATT(3)-RATE CMD
SC CONT-SCS
EMS FUNC/MODE-OFF/STBY
V46E (ACTIVATE APOLLO DAP)

DATE 6/25/75

J
2-15

PNL

INFORM APOLLO : UNDOCKING COMPLETED.

◄INFORM SOYUZ : UNDOCKING COMPLETED.

DOCKING SYSTEM A:

274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN
CB MOTORS AC1(3)-OPEN

DOCKING SYSTEM B:

CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN
CB MOTORS AC2(3)-OPEN

5 MAIN BUS TIE(2)-OFF(VERIFY)

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BACKUP UNDOCKING

APOLLO BACKUP UNDOCKING

PNL

HATCH 3-CLOSED (VERIFY)
HATCH 3 PEV-CLOSED (VERIFY)

INFORM APOLLO : APOLLO BACKUP UNDOCKING REQUIRED.

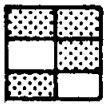
V48E(61102,11111)(DO NOT ACTIVATE DAP)

1 EMS FUNC/MODE-ΔV SET/STBY
SET ΔVC=+100.0 FPS
EMS FUNC-ΔV

DOCKING SYSTEM PREPARATION

DOCKING SYSTEM A:
274 CB IND LOGIC MNA-CLOSE
CB IND PWR AC1-CLOSE
CB CONTROL BAT A-CLOSE
CB MOTORS AC1(3)-CLOSE

DOCKING SYSTEM B:
CB IND LOGIC MNB-CLOSE
CB IND PWR AC2-CLOSE
CB CONTROL BAT B-CLOSE
CB MOTORS AC2(3)-CLOSE

PASSIVE DOCKING STATUS LIGHTS:

STRUCT LATCH OPEN LT-ON(VERIFY)
GUIDE RING CAPTURE LT-ON(VERIFY)
PASSIVE LT-ON(VERIFY)
STRUCT RING CONTACT LT-ON(VERIFY)

DATE 6/25/75

J
2-18

PNL

CONFIGURE BATTERY POWER:

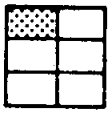
275 CB MAIN A BAT BUS A-CLOSE(VERIFY)
CB MAIN B BAT BUS B-CLOSE(VERIFY)

5 MAIN BUS TIE(2)-ON(UP)

TO INITIATE UNDOCKING:
EMS MODE-NORMAL

◄INFORM SOYUZ : INITIATING BACKUP UNDOCKING
5,4,3,2,1 MARK.

2 BACKUP PASSIVE A&B-RELEASE(~8 SEC)
CAPTURE LATCH A&B-RELEASE (MOM)



GUIDE RING CAPTURE LT-OUT
PASSIVE LT-OUT
STRUCT RING CONTACT LT-OUT

MONITOR UNDOCKING ΔVC=+100.2 FPS

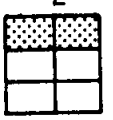
8 AUTO RCS SELECT(16)-MNA/MNB
1 BMAG MODE(3)-ATT1/RATE 2
MAN ATT (3)-RATE CMD
SC CONT-SCS
EMS FUNC/MODE-OFF/STBY
V46E(ACTIVATE APOLLO DAP)

◄INFORM SOYUZ : UNDOCKING COMPLETED.

INFORM APOLLO : UNDOCKING COMPLETED.

DATE 7/1/75

PNL



TO RESET PASSIVE HOOKS:

2 BACKUP PASSIVE A&B-RESET(~8 SEC)
PASSIVE LT-ON(LT MAY FLICKER)
STRUCT LATCH A-OPEN(~8 SEC)
STRUCT LATCH CLOSE LT-OUT
STRUCT LATCH OPEN LT-ON

DOCKING SYSTEM A:

274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN
CB MOTORS AC1(3)-OPEN

DOCKING SYSTEM B:

CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN
CB MOTORS AC2(3)-OPEN

5 MAIN BUS TIE(2)-OFF(VERIFY)

IF REQUIRED, CONTINUE NOMINAL APOLLO UNDOCKING PROCEDURES CONCERNING SOLAR ECLIPSE OR UVA.

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2-21

SOYUZ RESERVE UNDOCKING (PYROTECHNIC)

PNL

HATCH 3-CLOSED (VERIFY)
HATCH 3 PEV-CLOSED (VERIFY)
HATCH 1-CLOSED

◄INFORM SOYUZ : BACKUP UNDOCKING FAILURE.
MCC ADVICE REQUIRED. STANDBY.

V48E(61102,11111)(DO NOT ACTIVATE DAP)
EMS FUNC/MODE- ΔV SET/STBY
SET ΔVC=+100.0 FPS
EMS FUNC-ΔV

WITH MCC CONCURRENCE.

INFORM APOLLO : READY FOR RESERVE UNDOCKING.

EMS MODE-NORMAL
◄INFORM SOYUZ : READY FOR RESERVE UNDOCKING.

INFORM APOLLO : INITIATING RESERVE UNDOCKING
5,4,3,2,1 MARK.

MONITOR UNDOCKING ΔVC=+100.2 FPS

8 AUTO RCS SELECT(16)-MNA/MNB
1 BMAG MODE(3)-ATT1/RATE 2
MAN ATT (3)-RATE CMD
SC CONT-SCS
EMS FUNC/MODE-OFF/STBY
V46 (ACTIVATE APOLLO DAP)

DATE 6/25/75

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2-22

PNL

◄INFORM SOYUZ : UNDOCKING COMPLETED.

INFORM APOLLO : UNDOCKING COMPLETED.

DOCKING SYSTEM A:

274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN
CB MOTORS AC1(3)-OPEN

DOCKING SYSTEM B:

CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN
CB MOTORS AC2 (3)-OPEN

5 MAIN BUS TIE(2)-OFF(DN)

IF REQUIRED, CONTINUE NOMINAL APOLLO UNDOCKING PROCEDURES CONCERNING SOLAR ECLIPSE OR UVA.

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2-23

ACTIVE UNDOCKING/SEPARATION CHECKLIST

ACTIVE UNDOCKING/SEPARATION PREP

EMS FUNC/MODE - ΔV SET/STBY
SET ΔV = +100.0 FPS
EMS FUNC - ΔV
RHC PWR NORMAL #2 - AC/DC
RHC PWR DIRECT #2 - MNA/B
DBD/RATE - MIN/LOW
MAN ATT (P&Y) - RATE CMD (VER)
MAN ATT (ROLL) - MIN IMP (VER)
THC PWR - ON (UP)
COAS PWR - ON (UP)
RHC #2 - ARMED
THC - ARMED
EXT LTS RUN/EVA - OFF (VER)

* * * * * * * * CAUTION * * * * * * *
GUIDE RING-EXTD/RETR MUST BE OPERATED BY SYSTEM A OR B ONLY (SINGLE MOTOR). DYNAMIC FORCES USING 2 MOTORS COULD CREATE STRUCTURAL LOADS BEYOND DESIGN LIMITS.

STRUCT LATCH-OPEN MUST BE OPERATED BY SYSTEM A OR B ONLY (SINGLE MOTOR). STALLED GEAR BOX LOAD USING 2 MOTORS COULD EXCEED CABLE BREAKING STRENGTH.

MCC MAY ADVISE THAT MOTORS IN BOTH SYSTEMS ARE DEGRADED. THEREFORE, BOTH SYSTEMS (A&B) MAY BE OPERATED SIMULTANEOUSLY.
* * * * * * * * * * * * * * * * * * * *

3 NOTE:MONITOR FC 1 OR 2(SYSTEM A) OR FC 3(SYSTEM B) CURRENT WHEN OPERATING STRUCT LATCH,GUIDE RING,OR BACKUP PASSIVE MOTORS.

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```
     *IF SYSTEM B MOTORS REQUIRED:  *
     *                              *
275  *CB MAIN B BAT BUS B-CLOSE(VER)*
  5  *MAIN BUS TIE B/C - ON (UP)    *
     *                              *
     *IF SYSTEM A&B MOTORS REQUIRED:*
     *                              *
     *MAIN BUS TIE (2) - ON (UP)    *
     *                              *
     *TO AVOID EXCESS CURRENT DRAIN *
     *                              *
     *ON ENTRY BATTERIES:           *
     *                              *
     *MAIN BUS TIE (2) - OFF (DN)   *
     *  AFTER SYSTEM TASK PERFORMED *

  ←DP INFORM SOYUZ:
          PREPARING FOR UNDOCKING.


     DOCKING SYSTEM PREPARATION:

       DOCKING SYSTEM A:

274       CB IND LOGIC MNA - CLOSE
          CB IND PWR AC1 - CLOSE
          CB CONTROL BAT A - CLOSE
          CB MOTORS AC1 (3) - CLOSE

       DOCKING SYSTEM B:

274       CB IND LOGIC MNB - CLOSE
          CB IND PWR AC2 - CLOSE
          CB CONTROL BAT B - CLOSE
          CB MOTORS AC2 (3) - CLOSE

     SM RCS QUAD HTRS (4) -OFF

  3  DSE: (HBR/RCD/FWD/CMD RESET)
230  UP TLM - RELAY
```

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ACTIVE UNDOCKING/SEPARATION

DOCKING STATUS LIGHTS:
OUT OUT GUIDE RING CAPTURE LT - ON (VERIFY)
OUT LIT STRUCT RING CONTACT LT - ON (VERIFY)
LIT LIT STRUCT LATCH CLOSE LT - ON (VERIFY)

* IF SOYUZ CLOSED ACTIVE HOOKS: *
*
* ←DP INFORM SOYUZ: OPEN YOUR ACTIVE HOOKS. *
*
* [INFORM APOLLO: ACTIVE HOOKS OPEN.] *

55:00 ←DP INFORM SOYUZ: OPENING ACTIVE HOOKS.

2 STRUCT LATCH A - OPEN (~8 SEC)
STRUCT LATCH CLOSE LT - OUT
LIT OUT STRUCT LATCH OPEN LT - ON
OUT LIT * IF STRUCT LATCH OPEN LT - OUT: *
LIT OUT * USE BU PROCEDURE FOR APOLLO ACTIVE *
* UNDOCKING JOINT OPS CKLT PG J/3-4 *
STRUCT LATCH A - OFF (CTR)

56:00 AUTO RCS SEL (16) - MNA/B

58:00 ←DP INFORM SOYUZ: READY FOR UNDOCKING.

[INFORM APOLLO: READY FOR UNDOCKING.]

P48
59:00 VTR PWR (3) - ON
VTR HEAD WHEEL DRIVE MOTOR - ON
VTR TAPE MODE - RECORD
DAC - ON (VOICE MARK)

59:30 EMS MODE - NORMAL
V46E

59:55 ←DP INFORM SOYUZ: INITIATING UNDOCKING
5,4,3,2,1 MARK.

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2-26

00:00 CAPTURE LATCH A&B - RELEASE (MOM)
GUIDE RING CAPTURE LT - OUT
LIT LIT PASSIVE LT - ON
OUT OUT STRUCT RING CONTACT LT - OUT
OUT OUT
MONITOR UNDOCKING ΔVC = +100.2 FPS

←DP INFORM SOYUZ: UNDOCKING COMPLETED.

INFORM APOLLO: UNDOCKING COMPLETED.

00:15 THC - THRUST (-X) (4 JET) FOR 3 SEC
00:30 THC - THRUST (-X) (4 JET) FOR 4 SEC (1 MPS)

P00
EMS - OFF/STBY
THC PWR - OFF
RHC #2 - LOCKED

SM RCS QUAD HTR A - SEC
SM RCS QUAD HTRS B,C,D (3) - PRIM

07:00 DAC - OFF

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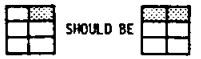
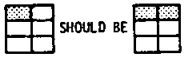
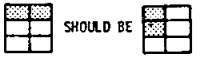
BACKUP PROCEDURES FOR APOLLO ACTIVE DOCKING

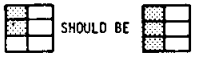
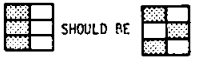
PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
DOCKING PREPARATION	STRUCT LATCH OPEN LT NOT ON  SHOULD BE OR  (ACTIVE HOOKS MAY BE CLOSED)	SENSE CIRCUIT FAILURE OR ACTIVE HOOKS ARE NOT OPEN (NORMALLY OPEN AT LAUNCH)	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) STRUCT LATCH B-OPEN (~8 SEC) MONITOR STATUS LT STRUCT LATCH B-OFF (CTR)	------	
			2. MAIN BUS TIE (2)-ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) STRUCT LATCH A&B-OPEN (~4 SEC) MONITOR STATUS LT STRUCT LATCH A&B-OFF (CTR)	------	
			3. CONTINUE ACTIVE DOCKING	------	
	PASSIVE LT NOT ON  SHOULD BE	SENSE CIRCUIT FAILURE OR GUIDE RING NOT FULLY RETRACTED OR PASSIVE HOOKS NOT CLOSED OR BODY LATCHES NOT LOCKED	1. MONITOR FC 1 CURRENT (PNL 3) GUIDE RING A-RETRACT (~40 SEC) MONITOR STATUS LT GUIDE RING A-OFF (CTR)	------	
			2. MAIN BUS TIE B/C-ON (UP) SEE CSM MALF PROC SYMPTOM 1 (Pg 14-3)	2. WE ARE HAVING DIFFICULTY WITH DOCKING PREPARATION. STANDBY.	2. У НАС ТРУДНОСТИ ПРИ ПОДГОТОВКЕ К СТЫКОВКЕ. БУДЬТЕ НА ПРИЕМЕ.
	GUIDE RING EXTD LT NOT ON  SHOULD BE OR  (GUIDE RING MAY BE PARTIALLY EXTENDED)	SENSE CIRCUIT FAILURE OR GUIDE RING DID NOT EXTEND	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) GUIDE RING B-EXTD (~40 SEC) (MAY CAUSE JET FIRING) MONITOR STATUS LT GUIDE RING B-OFF (CTR)	------	
			2. SEE CSM MALF PROC SYMPTOM 2 (Pg 14-5)	2. WE ARE HAVING DIFFICULTY WITH DOCKING PREPARATION. STANDBY.	2. У НАС ТРУДНОСТИ ПРИ ПОДГОТОВКЕ К СТЫКОВКЕ. БУДЬТЕ НА ПРИЕМЕ.

C 3-1

BACKUP DOCK/UNDOCK

BACKUP DOCK/UNDOCK

BACKUP PROCEDURES FOR APOLLO ACTIVE DOCKING (cont.)

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
CAPTURE	GUIDE RING CAPTURE LT NOT ON & NO SOYUZ CAPTURE LT  (APOLLO OR SOYUZ CAPTURE LT MAY BLINK)	SENSE CIRCUIT FAILURE OR CAPTURE LATCHES DID NOT ENGAGE	1. THRUST ASAP (THC -X ~1.0 SEC) A. IF CAPTURED AND APOLLO OR SOYUZ CAPTURE LT NOW ON, CONTINUE ACTIVE DOCKING B. IF CAPTURED AND STILL NO APOLLO OR SOYUZ CAPTURE LT, THRUST ASAP (THC -X ~1.0) CAPTURE LATCH A&B RELEASE (MOM) C. IF NO CAPTURE GO TO STEP 2.	1A. CAPTURE	1A. СЦЕПКА
			2. STATION KEEP AND ADVISE MCC. IF SOYUZ ORIENTATION SYSTEM WAS DISABLED AT CONTACT, DOCKING MUST BE DELAYED 1 REV. REATTEMPT DOCKING WITH MCC AND SOYUZ CONCURRENCE	2. MCC ADVICE REQUIRED. STANDBY. APOLLO READY TO REPEAT DOCKING. ARE YOU READY?	2. ТРЕБУЕТСЯ РЕКОМЕНДАЦИЯ ЦУПа. БУДЬТЕ НА ПРИЕМЕ. "АПОЛЛОН" ГОТОВ ПОВТОРИТЬ СТЫКОВКУ. ВЫ ГОТОВЫ?
			3. IF NO CAPTURE, GO TO STEP 1	-----	
STRUCTURAL RING CONTACT	GUIDE RING EXTD LT NOT OUT  OR STRUCT RING CONTACT LT NOT ON  (GUIDE RING MAY BE PARTIALLY RETRACTED)	SENSE CIRCUIT FAILURE OR GUIDE RING DID NOT RETRACT	1. VERIFY SOYUZ INTERFACE MATE LT	1. NO RETRACTION. IS YOUR INTERFACE MATE LT LIT?	1. НЕТ СТЯГИВАНИЯ. ВАШ ТРАНСПАРАНТ "СТЫК СОВМЕЩЕН" ГОРИТ?
			2. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) GUIDE RING B-RETRACT (~40 SEC) MONITOR STATUS LT GUIDE RING B-OFF (CTR)	2. PERFORMING BACKUP PROCEDURES. STANDBY.	2. ВЫПОЛНЯЕМ РЕЗЕРВНЫЕ ОПЕРАЦИИ. БУДЬТЕ НА ПРИЕМЕ.
			3. SEE CSM MALF PROC SYMPTOM 3 (Pg 14-6)	-----	

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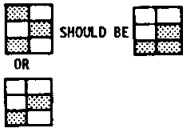
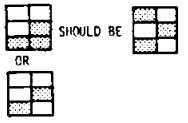
BACKUP PROCEDURES FOR APOLLO ACTIVE DOCKING (cont.)

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
STRUCTURAL RING CONTACT (cont'd)	STRUCT LATCH CLOSE LT NOT ON 	SENSE CIRCUIT FAILURE OR ACTIVE HOOKS DID NOT CLOSE	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) STRUCT LATCH B-OPEN (~8 SEC) STRUCT LATCH B-CLOSE (~8 SEC) MONITOR STATUS LT	------	
			2. VERIFY SOYUZ INTERFACE SEAL COMPRESS LT LIT. 2a. IF POSITIVE, SEE CSM MALF PROC SYMPTOM 4 BOX 4 (Pg 14-8) 2b. IF NEGATIVE, SEE CSM MALF PROC SYMPTOM 4a (Pg 14-8)	2. OUR ACTIVE HOOKS WILL NOT CLOSE. IS YOUR INTERFACE SEAL COMPRESS LT LIT?	2. НАШИ АКТИВНЫЕ КРЮКИ НЕ ЗАКРЫВАЮТСЯ. ВАШ ТРАНСПАРАНТ "СТЫК ОБЖАТЬ" ГОРИТ?

BACKUP PROCEDURES FOR APOLLO ACTIVE UNDOCKING

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
UNDOCKING PREPARATION	STRUCT LATCH OPEN LT NOT ON  SHOULD BE OR	SENSE CIRCUIT FAILURE OR ACTIVE HOOKS DID NOT OPEN	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) STRUCT LATCH A-OPEN (~8 SEC) MONITOR STATUS LT STRUCT LATCH B-OFF (CTR)	1. OUR ACTIVE HOOKS WILL NOT OPEN. STANDBY.	1. НАШИ АКТИВНЫЕ КРЮКИ НЕ ОТКРЫВАЮТСЯ. БУДЬТЕ НА ПРИЕМЕ.
			2. MAIN BUS TIE (2) - ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) STRUCT LATCH A&B-OPEN (~4 SEC) MONITOR STATUS LT STRUCT LATCH A&B-OFF (CTR)	-----	
			3. MONITOR FC 1 AND 3 CURRENT (PNL 3) BACKUP PASSIVE A&B-RELEASE (~8 SEC) (WILL NOT CHANGE LATCH STATUS LTS) CAPTURE LATCH A&B-RELEASE (MOM) MONITOR SEPARATION BACKUP PASSIVE A&B-RESET (~8 SEC) PASSIVE LT-ON (LT MAY FLICKER) STRUCT LATCH A-OPEN (~8 SEC) CONTINUE ACTIVE UNDOCKING PROCEDURES	3. INITIATING BACKUP UNDOCKING 5,4,3,2,1 MARK. UNDOCKING COMPLETED.	3. НАЧИНАЮ РЕЗЕРВНУЮ РАССТЫКОВКУ 5,4,3,2,1 МАРК. РАССТЫКОВКА ВЫПОЛНЕНА.
			4. IF NO SEPARATION, ADVISE MCC OF DOCKING SYSTEM STATUS WITH MCC CONCURRENCE, SOYUZ MAY RELEASE BODY LATCHES AND OPEN PASSIVE HOOKS (PYROTECHNICS) (SEE SOYUZ RESERVE UNDOCKING Pg 3/2-21)	-----	
	SOYUZ APDS MODE ACCOMPLISHED LT NOT ON AFTER SOYUZ ACTIVE HOOKS OPENING. (SOYUZ PASSIVE BUT ACTIVE HOOKS CLOSED)	SOYUZ ACTIVE HOOKS DID NOT OPEN	1. MAIN BUS TIE (2)-ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) BACKUP PASSIVE A&B-RELEASE (~8 SEC) CAPTURE LATCH A&B-RELEASE (MOM) MONITOR SEPARATION BACKUP PASSIVE A&B-RESET (~8 SEC) PASSIVE LT-ON (LT MAY FLICKER) STRUCT LATCH A-OPEN (~8 SEC)	1. INITIATING BACKUP UNDOCKING 5,4,3,2,1 MARK. UNDOCKING COMPLETED.	1. НАЧИНАЮ РАССТЫКОВКУ 5,4,3,2,1 МАРК. РАССТЫКОВКА ВЫПОЛНЕНА.
			2. WITH MCC CONCURRENCE, SOYUZ MAY OPEN ACTIVE HOOKS (PYROTECHNIC) (SEE SOYUZ RESERVE UNDOCKING Pg 3/2-21)	-----	

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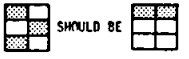
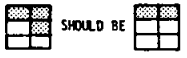
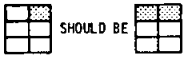
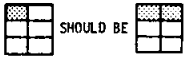
BACKUP PROCEDURES FOR APOLLO ACTIVE UNDOCKING (cont.)

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
SEPARATION	GUIDE RING CAPTURE LT NOT OUT (NO VISUAL SEPARATION CUE)  SHOULD BE	SENSE CIRCUIT FAILURE OR CAPTURE LATCHES DID NOT RELEASE	1. ADVISE MCC AND SOYUZ MONITOR SOYUZ COUNTDOWN TO SOYUZ BODY LATCH RELEASE	1. APOLLO CAPTURE LATCHES WILL NOT RELEASE. RELEASE YOUR BODY MOUNTED LATCHES.	1. ЗАЩЕЛКИ КОЛЬЦА "АПОЛЛОНА" НЕ ОТКРЫВАЮТСЯ. ОТКРОЙТЕ ВАШИ ЗАЩЕЛКИ КОРПУСА.
			2. IF STILL NO UNDOCKING, GO TO STANDARD DOCKED CONFIGURATION (Pg J/5-1) ADVISE MCC AND SOYUZ UNDOCKING DELAYED 1 REV.	2. UNDOCKING DELAYED 1 REVOLUTION.	2. РАССТЫКОВКА ПЕРЕНОСИТСЯ НА ОДИН ВИТОК.
	GUIDE RING CAPTURE LT OUT BUT NO VISUAL SEPARATION CUE.  SHOULD BE	APOLLO CAPTURE OR STRUCTURAL LATCH (ES) HUNG UP	1. MAIN BUS TIE (2)-ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) BACKUP PASSIVE A&B-RELEASE (~8 SEC) CAPTURE LATCH A&B-RELEASE (MOM) MONITOR SEPARATION BACKUP PASSIVE A&B-RESET (~8 SEC) PASSIVE LT-ON (LT MAY FLICKER) STRUCT LATCH A-OPEN (~8 SEC)	1. INITIATING BACKUP UNDOCKING 5,4,3,2,1 MARK. UNDOCKING COMPLETED.	1. НАЧИНАЮ РАССТЫКОВКУ 5,4,3,2,1 МАРК. РАССТЫКОВКА ВЫПОЛНЕНА.
			2. WITH MCC CONCURRENCE, SOYUZ MAY OPEN ACTIVE HOOKS (PYROTECHNIC) (SEE SOYUZ RESERVE UNDOCKING Pg J/2-21)	-----	

BACKUP PROCEDURES FOR APOLLO PASSIVE DOCKING

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
DOCKING PREPARATION	STRUCT LATCH OPEN LT NOT ON  SHOULD BE OR  (ACTIVE HOOKS MAY BE CLOSED)	SENSE CIRCUIT FAILURE OR ACTIVE HOOKS NOT OPEN	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) STRUCT LATCH B-OPEN (~8 SEC) MONITOR STATUS LT STRUCT LATCH B-OFF (CTR)	------	
			2. MAIN BUS TIE (2) - ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) STRUCT LATCH A&B-OPEN (~4 SEC) MONITOR STATUS LT STRUCT LATCH A&B-OFF (CTR)	------	
			3. CONTINUE PASSIVE DOCKING	------	
	PASSIVE LT NOT ON  SHOULD BE	SENSE CIRCUIT FAILURE OR GUIDE RING NOT FULLY RETRACTED OR PASSIVE HOOKS NOT CLOSED OR BODY LATCHES NOT LOCKED	1. MAIN BUS TIE B/C-ON (UP) MONITOR FC 3 CURRENT (PNL 3) GUIDE RING B-RETRACT (~40 SEC) MONITOR STATUS LT GUIDE RING B-OFF (CTR)	------	
			2. MAIN BUS TIE (2) - ON (UP) MONITOR FC 1 AND 3 CURRENT (PNL 3) BACKUP PASSIVE A&B-RESET (~8 SEC) PASSIVE LT-ON (LT MAY FLICKER) STRUCT LATCH A-OPEN (~8 SEC)	------	
			3. SEE CSM MALF PROC SYMPTOM 1 (Pg 14-3)	3. WE ARE HAVING DIFFICULTY WITH DOCKING PREPARATION. STANDBY.	3. У НАС ТРУДНОСТИ ПРИ ПОДГОТОВКЕ К СТЫКОВКЕ. БУДЬТЕ НА ПРИЕМЕ.

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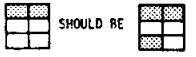
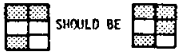
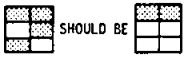
BACKUP PROCEDURES FOR APOLLO PASSIVE DOCKING (cont.)

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
CAPTURE	GUIDE RING CAPTURE LT NOT ON & NO SOYUZ CAPTURE LT  SHOULD BE	SENSE CIRCUIT FAILURE OR SOYUZ CAPTURE LATCHES DID NOT ENGAGE	1. THRUST ASAP (THC -X ~1.0 SEC) A. IF CAPTURED AND APOLLO OR SOYUZ CAPTURE LT NOW ON, CONTINUE PASSIVE DOCKING B. IF CAPTURED AND STILL NO APOLLO OR SOYUZ CAPTURE LT, INFORM SOYUZ TO RELEASE CAPTURE LATCHES C. IF NO CAPTURE, GO TO STEP 2.	1A. CAPTURE 1B. RELEASE YOUR CAPTURE LATCHES.	1A. СЦЕПКА 1Б. ОТКРОЙТЕ ВАШИ ЗАЩЕЛКИ КОЛЬЦА.
			2. STATION KEEP AND VERIFY APOLLO PASSIVE INDICATION AND ADVISE MCC. IF SOYUZ ORIENTATION SYSTEM WAS DISABLED AT CONTACT, DOCKING MUST BE DELAYED 1 REV. REATTEMPT PASSIVE DOCKING WITH MCC AND SOYUZ CONCURRENCE	2. MCC ADVICE REQUIRED. STANDBY. APOLLO READY TO REPEAT DOCKING.	2. ТРЕБУЕТСЯ РЕКОМЕНДАЦИЯ ЦУПа. БУДЬТЕ НА ПРИЕМЕ. "АПОЛЛОН" ГОТОВ ПОВТОРИТЬ СТЫКОВКУ.
			3. IF NO CAPTURE, GO TO STEP 1	-----	
STRUCTURAL RING CONTACT	STRUCT RING CONTACT LT NOT ON  SHOULD BE	SENSE CIRCUIT FAILURE OR SOYUZ GUIDE RING DID NOT RETRACT	1. AWAIT SOYUZ INTERFACE MATE LT STATUS	1. NO RETRACTION.	1. НЕТ СТЯГИВАНИЯ.
			2. MONITOR STATUS LT	2. DOCKING COMPLETED.	2. СТЫКОВКА ВЫПОЛНЕНА.
			3. ADVISE MCC	3. MCC ADVICE REQUIRED. STANDBY.	3. ТРЕБУЕТСЯ РЕКОМЕНДАЦИЯ ЦУПа. БУДЬТЕ НА ПРИЕМЕ.
STRUCTURAL LATCHES PRELOADED	SOYUZ INTERFACE SEALS COMPRESSED LT NOT ON	SOYUZ ACTIVE HOOKS DID NOT CLOSE	1. MCC REQUEST APOLLO TO CLOSE ACTIVE HOOKS MONITOR FC 1 CURRENT (PNL 3) STRUCT LATCH A-CLOSE (~8 SEC) MONITOR STRUCT LATCH CLOSE LT-ON STRUCT LATCH A-OFF (CTR)	1. CLOSING APOLLO ACTIVE HOOKS.	1. ЗАКРЫВАЮ АКТИВНЫЕ КРЮКИ "АПОЛЛОНА".

BACKUP PROCEDURES FOR APOLLO PASSIVE UNDOCKING

PHASE	SYMPTOM	PROBLEM	APOLLO PROCEDURE	INFORM SOYUZ:	
SEPARATION	GUIDE RING CAPTURE LT NOT OUT (STRUCT RING CONTACT LT NOT OUT AND NO VISUAL SEPARATION CUE)  SHOULD BE	SOYUZ CAPTURE LATCHES DID NOT RELEASE OR SOYUZ ACTIVE HOOKS DID NOT RELEASE	1. SOYUZ REQUEST APOLLO BACKUP UNDOCKING MONITOR FC 1 AND 3 CURRENT (PNL 3) (SEE APOLLO BACKUP UNDOCKING Pg J/2-17)	------	
		APOLLO PASSIVE HOOKS AND BODY LATCHES DID NOT RELEASE	2. ADVISE MCC (SEE SOYUZ RESERVE UNDOCKING Pg J/2-21)	------	

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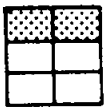
CONTINGENCY DOCKING SYSTEM EXTENSION VERIFICATION

PNL
-30:00 CM4/NK(B2)/300MM-EYEPIECE(A5)
LENS BRKT(A5)/DAC MOUNT(U1)



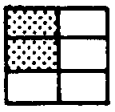
STRUCT LATCH OPEN LT-ON (VERIFY)
PASSIVE LT-ON (VERIFY)

ROTATE CAMERA TO PLACE SMALLEST VISIBLE LINE ON TARGET IN THE RANGEFINDER.
FOCUS CAMERA (FROM LOW END OF LENS SCALE) AND RECORD RANGE.

WARNING: DO NOT DISTURB CAMERA UNTIL GUIDE RING IS EXTENDED.

MCC WILL ADIVSE WHEN TO EXTEND AND RETRACT GUIDE RING.

0:00 GUIDE RING A-EXTEND (~40 SEC)
(MAY CAUSE JET FIRINGS)



PASSIVE LT-OUT
GUIDE RING EXTD LT-ON

GUIDE RING A-OFF (CTR)
FOCUS CAMERA (FROM LOW END OF LENS SCALE) ON THE SAME LINE AND RECORD RANGE.

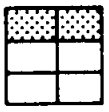
RANGE AT EXTENSION _____

RANGE AT RETRACTION _____

DISTANCES EXTENDED _____

COMPUTE GUIDE RING EXTENSION DISTANCE (RANGE AT EXTENSION MINUS RANGE AT RETRACTION).

2 GUIDE RING A-RETRACT (~40 SEC)



GUIDE RING EXTD LT-OUT
PASSIVE LT-ON

GUIDE RING A-OFF (CTR)

RESTOW CAMERA ASSEMBLY COMPONENTS

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DOCKING SYSTEM (CAMERA)

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DOCKING SYSTEM
(CAMERA)

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STANDARD APOLLO DOCKED CONFIGURATION

PNL

P00
V44E N87 R1 11111
R2 00146
R3 00000
N89 R1 +05000(RATE 0.5 DEG/SEC)
R2 +00050(DBD 0.5 DEG)

V45E(ACTIVATE DOCKED DAP)

RHC(BOTH)-LOCKED
THC-LOCKED

1 EMS FUNC/MODE-OFF/STBY
FDAI SCALE-5/1
FDAI SELECT-1/2
FDAI SOURCE-ATT SET
ATT SET-GDC
LIMIT CYCLE-OFF
DBD/RATE-MIN/HI
THC PWR-OFF
RHC PWR NORMAL(2)-OFF
RHC PWR DIRECT(2)-OFF

```
      * IF SCS ATTITUDE HOLD REQD:                *
8     *  AUTO RCS SELECT : A/C ROLL(4)-MNA/MNB   *
      *                  : B/D ROLL(4)-OFF       *
      *                  : C3,A4,D3,B4-MNA/MNB   *
      *                  : A3,C4,B3,D4-OFF       *
1     * FDAI SELECT-1                            *
      * BMAG MODE(3)-ATT 1/RATE 2                *
      * MAN ATT(3)-RATE CMD                      *
      * SC CONT-SCS                              *
```

MAN ATT(ROLL)-MIN IMP
MAN ATT(PITCH & YAW)-RATE CMD
SC CONT-CMC
CMC MODE-AUTO
BMAG MODE(3)-RATE 2

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STANDARD DOCKED CONFIGURATION

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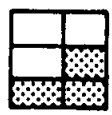
PNL

2 GUIDE RING A&B-OFF(CTR)
STRUCT LATCH A&B-OFF(CTR)



ACTIVE DOCKING SYSTEM:
GUIDE RING CAPTURE LT-ON
STRUCT RING CONTACT LT-ON
STRUCT LATCH CLOSE LT-ON

* PASSIVE DOCKING SYSTEM: *
* STRUCT LATCH OPEN LT-ON *
* GUIDE RING CAPTURE LT-ON *
* PASSIVE LT-ON *
* STRUCT RING CONTACT LT-ON *

2 SM RCS PSM PRPLNT TB(4)-GRAY
SM RCS PRIM PRPLNT TB(4)-BP
SEC PRPLNT TB(4)-BP
SM RCS QUAD HELIUM TB(4)-BP

3 VHF RANGING-OFF

5 CB G&N IMU(2)-CLOSED
CB G&N IMU HTR(2)-CLOSED
CB G&N CMPTR(2)-CLOSED
MAIN BUS TIE(2)-OFF

7 FDAI/GPI PWR-BOTH
LOGIC PWR 2/3-ON(UP)
SCS ELECTRONICS PWR-GDC/ECA
SIG CONDR/DRIVER BIAS PWR 1-AC1
SIG CONDR/DRIVER BIAS PWR 2-AC2
BMAG PWR(2)-ON

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PNL

8 AUTO RCS SELECT : A/C & B/D ROLL(8)-MNA/MNB
: PITCH & YAW(8)-OFF
* IF SCS REQD: *
* A/C ROLL(4)-MNA/MNB(VERIFY) *
* B/D ROLL(4)-OFF(VERIFY) *
* C3,A4,D3,B4-MNA/MNB(VERIFY) *
* A3,C4,B3,D4-OFF(VERIFY) *

13 FDAI(2)-INRTL

15 COAS PWR-OFF

100 G&N PWR/OPTICS-OFF
G&N PWR/IMU-ON(UP)

122 OPTICS ZERO-ZERO

DOCKING SYSTEM A:
274 CB IND LOGIC MNA-OPEN
CB IND PWR AC1-OPEN
CB CONTROL BAT A-OPEN
CB MOTORS AC1(3)-OPEN
CB DM POWER(2)-CLOSED(VERIFY)

DOCKING SYSTEM B:
CB IND LOGIC MNB-OPEN
CB IND PWR AC2-OPEN
CB CONTROL BAT B-OPEN
CB MOTORS AC2(3)-OPEN

◄INFORM SOYUZ : DOCKING SYSTEM POWER OFF.

DATE 6/25/75

APOLLO DOCKED ORIENTATION MANEUVERS

ASSUMES STANDARD APOLLO DOCKED
CONFIGURATION(J/5-1)
ASSUMES P52 COMPLETED AND GDC ALIGNED TO IMU

PNL

V44E N87 R1 11111
R2 00146
R3 00000
N89 R1+05000(RATE 0.5 DEG/SEC)
R2+00050(DBD 0.5 DEG)

1 CMC MODE-FREE
V45E
CMC MODE-AUTO

DBD/RATE-MIN/HI(VERIFY)
RHC PWR NORMAL #2-AC/DC
RHC#2-UNLOCKED

*IF SCS CONTROL REQD: *
8 * AUTO RCS SELECT : A/C ROLL(4)-MNA/MNB *
* : B/D ROLL(4)-OFF *
* : PITCH & YAW(8)-MNA/MNB *
1 * FDAI SELECT-1 *
* MAN ATT(3)-RATE CMD *
* SC CONT-SCS *
* BMAG MODE(3)-ATT 1/RATE 2 *
* SET ASCP THUMBWHEELS TO PAD ANGLES *

P00
V62E
V49E,LOAD N22 WITH PAD ANGLES

◄INFORM SOYUZ : READY FOR ORIENTATION.

INFORM APOLLO : READY FOR _____ ORIENTATION.
(INERTIAL)
(ORBITAL)
(SOLAR)
(UNDOCKING)

DATE 6/25/75

J
6-2

PNL ◄INFORM SOYUZ : ORIENTATION ESTABLISHED.

V44E N87 R1 11111
R2 00146
R3 00000
N89 R1+05000(RATE 0.5 DEG/SEC)
R2+00500(DBD 5.0 DEG)

1 CMC MODE-FREE
V45E
CMC MODE-AUTO
RHC#2-LOCKED

DATE 6/25/75

USA/USSR Photo & Movie Operations

DATA ACQUISITION CAMERA (DAC)

1. SET SHUTTER SPEED. Position SPEED knob to desired setting. For TIME exposures, SPEED must be set to 1/60.

2. SET SEQUENCING MODE. Five are available. Position mode switch to 2,6,12,or 24fps or TIME. Mode can be changed while camera running.

3. OPERATE DAC USING ON/OFF BUTTON. For 2, 6,12fps, and TIME modes, depress and release button to start camera, then repeat to stop. For 24fps button must be depressed continually for camera to run.

4. GREEN OPERATE LIGHT indicates camera operation. It will come on for 6 sec when power is applied to camera; this indicates a good circuit. (Small micro-switch at cam/magazine interface must be depressed to close circuit.) When cam is operating green light will flash at selected frame rate. For TIME exposure, light flashes once at shutter closing.

5. TEST. When camera is ready for operation a short 2 sec burst will indicate that everything is working properly.

LENSES - 5mm/10mm/25mm/75mm

1. INSTALL LENS ON DAC. Align orange index marks on lens and DAC, insert, and rotate CW to lock. Reverse to remove lens.

2. MAKE LENS SETTINGS. Using settings from checklist or the spotmeter, set fstop on the aperture ring. Detents are at full stops; half stops can be selected. Set focus ring for desired focus distance. (Focus is fixed on 5mm lens.) Detents are at infinity and one other setting (10mm - 2', 75mm - 10'). No detents for the 25mm.

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PHOTO/MOVIE OPS

J
7-2

140 FT MAGAZINE

1. INSTALL FILM MAGAZINE. Verify set of perf's is aligned with orange index line in mag opening. If not, move film per arrow no more than 2 frames total. Install mag on DAC. Tighten DAC locknut CW (green operate light should come on for approx 6 sec then go off). Reverse to remove mag.

2. CHECK FILM INDICATOR. Gross amount of film remaining (accurate to about 10%) is indicated by ball against % scale.

3. RED END-OF-FILM LIGHT indicates film depletion. It will initially illuminate when 1.8 meters (6 feet) of film remains and will stay on continuously. Camera will continue running when film is depleted.

POWER CABLE

1. ATTACH POWER CABLE. Align orange index marks of cable connector and DAC power connector, insert, and rotate CW. Reverse to remove. Cable attaches to UTILITY POWER connector in S/C.

SJ-BOX ADAPTER

******* TO BE USED ONLY IN SOYUZ *******

1. CONNECT ADAPTER (male end) to DAC power cable, then adapter (female end) to SJ-box.

FUSES

1. INSTALL REPLACEMENT FUSE (if reqd). Fuse is inserted in corner of camera body. Spares are located in R3 (Data Card Kit).

PHOTO/MOVIE OPS

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J
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DAC_TIMING_CABLE

1. ATTACH DAC TIMING CABLE (if reqd). Connect DAC end to POWER connector same as power cable. Connect S/C end to pnl 227. Turn SCI INST PWR sw to PWR.

REMOTE_CONTROL_CABLE

1. ATTACH REMOTE CONTROL CABLE (if reqd). Insure DAC is stopped. Connect cable by aligning blue index marks on cable and rearmost DAC connector, inserting and rotating connector. Operate DAC at 24fps only by placing toggle sw in the ON position. Camera will run until sw is placed in OFF. Remote cable will attach to DAC by means of the mounting shoe.

DAC_MOUNT

1. ATTACH DAC MOUNTING BRACKET to camera (if reqd). Slide rail into dovetail. Bracket can be mounted above LH or RH rndz windows to dovetail.

U-MOUNT

1. ATTACH UNIVERSAL MOUNT to camera (if reqd). Slide rail into dovetail with lens pointing in direction of arrow and lock. Depress button to remove. Attach bracket to any TV camera receptacle by inserting and rotating until locked. Set X,Y, and Z angles per checklist. Depress lock button to remove from receptacle.

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RIGHT_ANGLE_MIRROR

1. ATTACH RIGHT ANGLE MIRROR (if reqd). Align orange index lines of mirror and lens. Insert mirror lugs into lens mounting. Rotate mirror CW until snap locked.

J
7-4

RINGSIGHT

1. ATTACH RING SIGHT (if reqd). Slide into shoe on top of camera.

AUXILLARY_PHOTO_LIGHT

1. MOUNT LIGHT to DAC, to Velcro pad on S/C wall, or handhold (as called for in C/L).
2. TURN LIGHT ON using recessed switch. LOW position lights one tube ; HIGH lights both tubes. Light has a useful life of 18 hrs (6 hr/batt).BE SURE TO TURN OFF WHEN NOT REQD.
3. CHANGE BATTERIES (A5)

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STILL_CAMERA_FK-6

1. Lens: 3.5/45 mm
   Focusing range: 0.5 m - infinity

2. Apertures are set by aligning the desired f-stop with the principal reference mark on the lens housing.

3. The camera is focused optically using frosted glass with a range finder in the center of the field or by setting the distance scale on the lens.

4. DEPTH OF FIELD is determined by using the distance scale with a supplementary lens scale, and is checked by depressing the depth of field monitor lever.

5. The shutter provides standard speeds of 1/2 to 1/1000 sec and speed 'B' (time exposure).

6. The cocking lever is interlocked with the film advance mechanism, with the frame counter and with the mechanism which sets the mirror into operating position.

7. Shutter speed can be set with the shutter either tripped or cocked by aligning the selected value on the exposure ring with the index on the upper part of the camera housing.

8. The frame counter is automatically reset in initial position 'H' when the back plate of the camera is opened.

9. Photos are taken untill the letter 'K' appears in the frame counter window. The remaining leader is advanced by means of the cocking lever but without tripping the shutter.

10. Film is obtained from canisters 7, 8, 9 & 10.

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2 SECOND JOINT ACTIVITY PERIOD PHOTO PROCEDURES (IN APOLLO)

INITIAL SETUP: 606/DAC01(RHTSB)/5mm(RHTSB)/CI04(F2) - PWR CABLE(PNL 16),
*** REMOTE(RHTSB) X=330 Y=270 Z=290/PIN IN HOLE #1

DAC TV BRKT IN RHTSB

231/DAC02(LHTSB)/10mm(RHTSB)/CI09(F2) - PWR CABLE(PNL 100),REMOTE X=270 Y=320 Z=355/PIN IN HOLE #1

PORTABLE LIGHT - UNDER SPEAKER BOX(PL1) FACING LEB

*** MOUNT DAC TO TV CAM

PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	X Y Z	PIN #	LENS SET-TING	PORT LT LOC	SHOOTING DIRECTIONS
2.1	SC XFER TO CM	DAC01 *** 606	CI04	5mm	330 270 290	1	f2.0 1/60 --	PL1 FACING LEB	SHOOT UP MAG
P/M 8.1A	SC XFER TO CM	DAC02 231	CI09	10mm	270 320 355	1	f1.8 1/60 6'	PL1 FACING LEB	2 MIN
P/M 8.2A	DP WELCOME SC	DAC02 HH	CI09	10mm			f1.8 1/60 3'	POINT AT DP	30 SEC
2.2	CM TOUR	DAC01 606	CI05 (pocket)	5mm	320 180 260	2	f2.0 1/60 --	PL1 FACING LH COUCH	SHOOT UP MAG
P/M 8.3A	CM TOUR	FK-6	N7	45mm			f3.5 1/15	PL1 FACING LH COUCH	2-3FR
P/M 8.3.1A	CM TOUR - AC	DAC02 HH	CI09	10mm			f1.8 1/60 3'	PL1 FACING LH COUCH	30 SEC
P/M 8.4A	CM TOUR - SC	DAC02 HH	CI09	10mm			f1.8 1/60 3'	PL1 FACING LH COUCH	30 SEC
2.2.1	PLAQUE JOINING	DAC01 *** 606	CI06 (pocket)	5mm	330 270 290	1	f2.0 1/60 --	PL1 FACING LEB	30 SEC
P/M 8.5A	PREPARING FOR TOUR OF USSR	DAC01 11	CI06	5mm	65 20 162	1	f2.0 1/60 --	PL1 FACING WINDOW 3	1 MIN
P/M 8.6A	PREPARING FOR TOUR OF USSR	DAC02 HH	CI10 (LH TSB)	10mm			f1.8 1/60 3'	PL1 FACING WINDOW 3	20 SEC
P/M 8.7A	PREPARING FOR TOUR OF USSR	FK-6	N7	45mm			f3.5 1/15	PL1 FACING WINDOW 3	2-3FR
P/M 8.8A	SOYUZ THRU CM2	DAC02 HH	CI10	10mm			f11 1/250 15'	NO LIGHT	1 MIN
P/M 8.9A	SOYUZ THRU CM2	FK-6	N7	45mm			f8 1/250	NO LIGHT	6-8FR

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2 PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	X Y Z	PIN #	SET-TING	PORT LT LOC	SHOOTING DIRECTIONS
2.3	TOUR OF USSR	DAC01 11	CI06	5mm	65 20 162	1	f2.0 1/60 --	NO LIGHT	1 MIN
P/M 8.10A	AC & SC LOOK OUT WINDOW 3	FK-6	N8	45mm			f3.5 1/15	NO LIGHT	3-4FR
2.4	SC USING EXERCISER	DAC02 HH	CI10	10mm			f1.8 1/60 3'	MOUNT ON CAMERA	30 SEC
2.5	MEAL	DAC01 *** 606	CI06	5mm	330 270 290	1	f2.0 1/60 --	PL1 FACING LEB	1 MIN
P/M 8.11A	MEAL	DAC02 607	CI10	10mm	302 262 317	1	f1.8 1/60 6'	PL1 FACING LEB	20 SEC
P/M 8.12A	MEAL - AC & DP	DAC02 HH	CI10	10mm			f1.8 1/60 3'	MOUNT ON CAMERA	30 SEC
P/M 8.13A	MEAL - AC & SC	DAC02 HH	CI10	10mm			f1.8 1/60 3'	MOUNT ON CAMERA	30 SEC
P/M 8.14A	MEAL - AC & SC	FK-6	N8	45mm			f3.5 1/15	PL1 FACING LEB	3-4 FR
P/M 8.15A	MEAL	FK-6	N8	45mm			f3.5 1/15	PL1 FACING LEB	3-4 FR
P/M 8.16A	FURNACE OPS	FK-6	N9	45mm			f3.5 1/15	PL7 FACING FURNACE	3-4 FR
2.6	FURNACE OPS	DAC02 857	CI07 (DP)	5mm	0 270 350	3	f2.0 1/60 --	PL7 FACING FURNACE	SHOOT UP MAG
P/M 8.17A	FURNACE OPS AC & SC	DAC01 872	CI11 (LH TSB)	5mm	268 250 350	2	f2.0 1/60 --	PL7 FACING FURNACE	2 MIN
P/M 9.1A	AC & SC IN DM	FK-6	N9	45mm			f3.5 1/15	PL7 FACING FURNACE	3-4 FR
P/M 9.2A	SC TAKES CAR-TRIDGES AND XFERS TO OM	DAC01 872	CI11	5mm	268 250 350	2	f2.0 1/60 --	PL4 FACING FURNACE	SHOOT UP MAG
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THIRD JOINT ACTIVITY PERIOD PHOTO PROCEDURES (IN APOLLO)

INITIAL SETUP: 606/DAC02(LH TSB)/5mm/CI08(F2) - PWR CABLE(PNL 16),
*** REMOTE X=330 Y=270 Z=290/PIN IN HOLE #1

*** MOUNT DAC TO TV CAM

PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	X Y Z	PIN #	LENS SET-TING	PORT LT LOC	SHOOTING DIRECTIONS
P/M 9.3A	DP PREPARES TV CAMERA FOR PRESS CONF	FK-6 (LH TSB)	N9	45mm			f3.5 1/15	PL1 FACING RH COUCH	3-4 FR
P/M 9.4A	PRESS CONF	DAC01 607	CI12 (LH TSB)	10mm (LH TSB)	302 262 320	1	f1.8 1/60 6°	PL1 FACING LEB	2 MIN
3.1	PRESS CONF	DAC02 *** 606	CI08	5mm	330 270 290	1	f2.0 1/60 --	PL1 FACING LEB	2 MIN
P/M 9.5A	PRESS CONF	FK-6	N10	45mm			f3.5 1/15	PL1 FACING LEB	2 FR
3.2	MICROBIAL EX - FE SAMPLING	DAC02 *** 606	CI08	5mm	330 270 290	1	f2.0 1/60 --	PL1 FACING LEB	2 MIN
P/M 9.6A	MICROBIAL EX - FE SAMPLING	FK-6	N10	45mm			f3.5 1/15	PL1 FACING LEB	2-3 FR
P/M 9.7A	MICROBIAL EX - CP SAMPLING	DAC01 607	CI12	10mm	302 262 320	1	f1.8 1/60 6°	PL1 FACING LEB	2 MIN
P/M 9.8A	MICROBIAL EX - CP SAMPLING	FK-6	N10	45mm			f3.5 1/15	PL1 FACING LEB	2-3 FR
P/M 9.9A	PERF OF SYMB ACTIVITIES	FK-6	N10	45mm			f3.5 1/15	PL1 FAC-ING LEB	3-4 FR

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FIRST JOINT ACTIVITY PERIOD PHOTO PROCEDURES (IN SOYUZ)

PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	X Y Z	PIN #	LENS SET-TING	LIGHTING	SHOOTING DIRECTIONS
1.2S	SIGNING OF DOCKING CERTIFICATE	DAC01 TA1	CS01	5mm	0 270 310	1	f4 1/60	SL1-ON PLU-ON/T1	2 MIN
1.3S	SIGNING OF DOCKING CERTIFICATE	NK		35mm			f11 1/60 FOCUS	FLASH RANGE 2	4 FR
1.4S	MEAL	DAC01 TA1	CS01	5mm	0 90 300	3	f4 1/60	SL1-ON PLU-ON/T1	SHOOT UP MAG
1.5S	PANORAMA OF OM	DAC01 HH	CS02 TSB	10mm			f4 1/60 3'	SL1-ON PLU-ON/T1	USE AS MUCH FILM AS DESIRED
1.6S	MEAL	NK		35mm			f11 1/60 FOCUS	FLASH RANGE 2	8-10 FR
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SECOND JOINT ACTIVITY PERIOD PHOTO PROCEDURES (IN SOYUZ)

PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	LENS SET-TING	LIGHTING	SHOOTING DIRECTIONS
P/M 8.4	FE PERFORMING ZFF EXPERIMENT	K-3A HH	N3 CON3	20mm	f2.0	SL1-ON	20SEC
2.1S	TOUR OF DV	NK		35mm	f11,1/60 FOCUS	FLASH RANGE 2	8-10 FR
2.2S	JOINING OF PLAQUE	NK					2 FR
2.3S	CP USING EXERCISER	NK					2 FR
2.4S	FE DOING EARTH OBS	NK					2 FR
2.5S	FE PREPARING FOOD	NK					2 FR
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THIRD JOINT ACTIVITY PERIOD PHOTO PROCEDURES (IN SOYUZ)

PHOTO #	ACTIVITY	CAM LOC	MAG LOC	LENS	LENS SET-TING	LIGHTING	SHOOTING DIRECTIONS
P/M 9.2	SC CHECKS HATCH INTEGRITY	K-3A HH	N3 CON3	12.5mm	f2.0	SL1-ON SL2-ON	20 SEC
P/M 9.3	SC WORKS WITH PRESSURE LEAK C&D	K-3A HH	N3	20mm	f2.0	SL1-ON SL2-ON	15 SEC
P/M 9.6	SC COMMUNICATES WITH MCC	K-3A HH	N3	20mm	f2.0	SL1-ON PLU-ON/T1	20 SEC
3.1S	PRESS CONFERENCE - SC	NK		35mm	f11,1/60 FOCUS	FLASH RANGE 2	2 FR
3.2S	PRESS CONFERENCE - AC	NK					2 FR
3.3S	MICROBIAL EXCHANGE SC SAMPLES SOYUZ	NK					3 FR
3.4S	AC DOING TOUR OF FLORIDA	NK					2 FR
3.5S	EXCHANGE OF SEEDS	NK					2 FR
P/M 10.2	MICROBIAL EXCHANGE DP SAMPLES SC	K-3A HH	N4 CON3	12.5mm	f2.0	SL1-ON SL2-ON	20 SEC

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CM TV CUE CARD

TV
2.1

LEB PRESS CONF,
TOUR, FOOD DEMO

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 10,175,105
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,SLAVE,LINEAR
LOC	- 605 (HOLE 4)
LIGHTS	- MAX & PL (STRUT LTS OFF FOR TOUR) FILTERS REMOVED (U2)

TV
2.2

MAIN PANEL

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 305,90,45
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,SLAVE,LINEAR
LOC	- 231 (HOLE 1)
LIGHTS	- MAX - TV FILTERS INSTALLED (U2)

TV
2.9

OTW GROUND TOURS

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 20,90,225
F,ZOOM,FOC	- 22,100,inf (ZOOM LENS)
CAMR	- AVG,SLAVE,LINEAR
LOC	- 605 (HOLE 1)
LIGHTS	- MAX EXCEPT RH INTERIOR LTS OFF

TV
2.10

CM SIDE HATCH
AREA

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 290,40,200
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,SLAVE,LINEAR
LOC	- 11 (HOLE 3)
LIGHTS	- MAX & PL- TV FILTERS INSTALLED (U2)

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TV OPS

CM TV CUE CARD (CONT)

TV
2.14

HATCH 1 AREA

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 260,10,5
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,SLAVE,LINEAR (MASTER IF OM CAMR OFF)
LOC	- 11 (HOLE 4)
LIGHTS	- MAX

TV
2.15

CDR COUCH

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 80,175,95
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,SLAVE,LINEAR
LOC	- 11 (HOLE 4)
LIGHTS	- MAX - TV FILTERS INSTALLED (U2)

TV
2.18

AC & CP COUCHES

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 105,190,65
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- 11 (HOLE 4)
LIGHTS	- MAX - TV FILTERS INSTALLED (U2)

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TV OPS

CM TV CUE CARD (CONT)

TV
2.19

OTW OF SOYUZ, DM

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 325,90,155
F,ZOOM,FOC	- 22,25,15
CAMR	- AVG,SLAVE,LINEAR
LOC	- 606 (HOLE 1)
LIGHTS	- RH WALL LIGHT - OFF
REMARKS	- READJUST ZOOM AS RANGE REQUIRES
	- SELECT PEAK IF WHITE CONTENT OF SCENE DROPS BELOW APPROX 10%

TV
2.20

SAM EQUIP INSTALL

SHOE	- RIGHT
ARROW	- REAR
X,Y,Z	- 90,100,40
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- 11 (HOLE 1)
LIGHTS	- MAX

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SOYUZ TV CUE CARD

TV
2.7

OM PANEL & TOUR

SHOE	- RIGHT
ARROW	- REAR
X,Y,Z	- 0,0,105
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- TA3 (HOLE 4)
LIGHTS	- GRP I-OFF,GRP II-ON, PLU-ON/T2
	- WORK LTS - MAX

TV
2.8

DV INTERIOR & TOUR

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 30,70,20
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- TA4 (HOLE 1)
LIGHTS	- SPECIAL LTS-ON, SPECIAL LT 9-OFF
	- WORK LTS - MAX
	- INSTALL RH WINDOW SHADE

TV
2.12

OM SOFA

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 340,0,65
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- TA1 (HOLE 2)
LIGHTS	- GRP II-OFF,GRP I-ON, PLU-ON/T1
	- WORK LTS - MAX

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SOYUZ TV CUE CARD (CONT)

TV
2.16

HATCH 4 AREA

SHOE	- TOP
ARROW	- RIGHT
X,Y,Z	- 290,170,0
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- TA2 (HOLE 1)
LIGHTS	- GRP I-OFF, GRP II-ON, PLU-ON/T3 WORK LTS - OFF

TV
2.17

OM WINDOW AREA

SHOE	- LEFT
ARROW	- REAR
X,Y,Z	- 325,0,75
F,ZOOM,FOC	- 3.5,9,10
CAMR	- AVG,MASTER,LINEAR
LOC	- TA1 (HOLE 2)
LIGHTS	- GRP II-OFF, GRP I-ON, PLU-ON/T1 - WORK LTS - MAX

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APOLLO WASTE MANAGEMENT AND PERSONAL HYGIENE SYSTEM OPERATION

Urine collection

PRIMARY SYSTEM:

1. Urine Transfer System (UTS)
   - Obtain the UTS (R11) and verify that the valve is closed
   - Attach a roll-on cuff (R11) to the UTS receiver
   - Affix cuff to self
   - Open the UTS valve
   - Perform task
   - Close the UTS valve
   - Remove the roll-on cuff
   - Use tissue (A2) to absorb free urine in the cuff
   - Stow the UTS (temporary stowage)
   - When convenient, transfer urine by procedure 2. below

2. UTS/Urine bag transfer
   - UTS vlv - CLOSED (Verify)
   - Connect UTS to Urine Bag
   - Roll UTS Bag to transfer urine
   - When transfer complete, disconnect UTS from Urine Bag & stow

BACKUP SYSTEM:

Urine Receptacle Assembly (URA)
- Connect the urine line filter to the urine transfer hose
- Connect the urine transfer hose/filter to the urine-overboard QD
- Connect the urine receptacle to the urine transfer hose
- Place the URA valve to VENT
- Remove the receptacle cover
- Place the OVERBOARD DRAIN valve to DUMP

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NOTE

Direct urine stream parallel to honeycomb to prevent splashback. Avoid accelerations to URA during use. Remove last drop by touching screen at top of URA.

Perform task
Flush screen and honeycomb with water gun (10 sec maximum)
Replace the receptacle cover after liquid has cleared from URA
Verify the URA valve is in VENT and purge URA for 2-5 min
Close the URA valve
Stow the URA (Retainer strap-A1) for next use with urine transfer hose connected and OVERBOARD DRAIN valve in DUMP (Verify) to allow URA to vacuum dry

Defecation

Remove fecal collection assembly from stowage (U1 or A2)
Obtain defecation collection device from assembly
Remove germicide pouch & remove protective cover
Insert germicide pouch (protective cover removed) into inner fecal bag

WARNING

If germicide pouch is accidently ruptured, proceed as follows:
Germicide on CM surface or hardware; wipe up with tissue
Germicide on crewman's skin; blot with tissue and flush with water
Germicide in crewman's eyes; irrigate with water from water gun or soaked tissue
Germicide ingested; take magnesium compound and/or high protein food - do not induce vomiting.

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Remove the protective covering from the lip of inner fecal bag and place into bag
Affix the inner fecal bag to self
Perform task
Seal inner fecal bag (remove air prior to sealing)
Rupture the germicide pouch
Knead contents for 4 min
Insert into the outer fecal bag & seal outer bag
To vent odors from waste stowage container:
Connect UT hose/filter to WASTE STOWAGE QD
Connect UT hose to vent QD on stowage container (A-1)
Place the WASTE STOWAGE VENT valve to VENT for 30 seconds, then CLOSE
Stow the fecal bag in waste stowage container.

Emesis

Obtain a fecal bag (U1 or A2)
Perform task
Insert the germicide pouch (protective cover removed) into inner bag
Seal the inner bag
Rupture the germicide pouch
Insert the inner bag into the outer bag and seal
To vent odors from waste stowage container:
Connect UT hose/filter to WASTE STOWAGE QD
Connect UT hose to vent QD on stowage container (A1)
Place the WASTE STOWAGE VENT valve to VENT for 30 seconds then CLOSE
Stow the outer bag in the waste stowage container.

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ZONE FORMING FUNGI (AS-1)

ZFF PHOTOS

FIRST PERFORMANCE ONLY
Remove 2 ZFF devices from R-5
Mount on LEB wall (Right of PNL 121)

Turn all cabin interior lights on high (PNL 100,5,8 FIXED, fullbright)

HH/NK/35/CI/CRYSTAL GROWTH FRAMING DEVICE (U1)(f2.8,1/15,1') 2FR

Hold camera and bracket assembly against LEB with device centered when making exposures

Log photos taken (Required every 12 +/- 3 hours)

GET	FILM MAG	FR #	DEVICE S/N

JOINT EXPTS
AS-1, 2, 5

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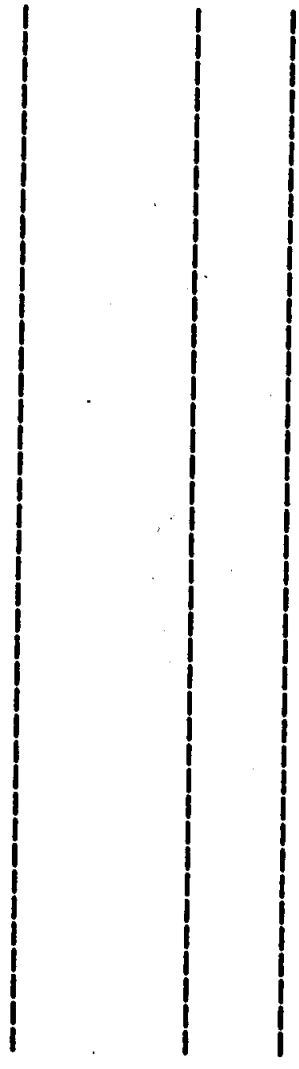
GET FILM MAG FR # DEVICE S/N



After last performance stow in R-5
parallel to Y-Z plane

JOINT EXPTS
AS-1, 2, 5

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MICROBIAL EXCHANGE (AS-2)

MICROBIAL EXCHANGE CSM

Obtain MICROBIAL EXCHANGE KIT # 3

Unfold and fasten with velcro to LEB wall

Replace used tubes in kit reversed from stowed position

NOTE - Log next to table any deviations of sampling locations from TABLE 1

TABLE 1

TUBE	AREA
1	HAIR
2	AUDITORY CANALS
3	BACK OF NECK BELOW HAIR LINE
4	NOSTRILS
5	ORAL CAVITY
6	PALM

Fold kit # 3 and place in bungee bag in LEB

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Obtain MICROBIAL EXCHANGE KIT # 4
Unfold and fasten with velcro
to a convenient place

CSM SAMPLING

Swab the entire area between the
black lines where applicable
per this list

Replace used tubes in kit reversed
from stowed position

TUBE	AREA
A1	Left X-X head strut
A2	Right X-X foot strut
A3	Right hand couch stablizer beam
A4	Between PNL 10 and 12
A5	RH flood light (side near window 4)
A6	Left hand rotational controller
A7	Right girth shelf
A8	PNL 325
A9	Area near location 607
A10	Cover of ORDEAL STOWAGE LOCKER
A11	B6 behind bag
A12	L3 inside door
A13	Top of VTR
A14	PNL 251 WASTE STOWAGE OD and URINE OVBD OD AREA
A15	Forward of PNL 225

Fold kit #4 and place in bungee
bag in LEB

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UV ABSORPTION (AS-5)

COAS CAL

1. Verify COAS CAL attitude
   (225,145,348)
   Verify VEGA near center of COAS
   PNL 1
   RHC PWR NORMAL (2) - AC/DC
   MAN ATT (3) - MIN IMP
   SC CONT - SCS
   Inhibit RCS jets - A3,C4,B3,D4

2. PNL 101
   SYSTEMS TEST mtr - C,8
   PNL 230 (verify)
   UV COVER - off(ctr)
   HE GLOW COVER - off(ctr)
   EUV COVER - off(ctr)
   X-RAY COVER - off(ctr)
   PNL 274
   ELECTROPHORESIS/COVERS MNA/MNB -
   close(verify)
   PNL 230
   EXPERIMENT COVERS MNA/MNB - close
   EXPERIMENT COVERS ARM/SAFE - ARM
   UV ABSORPTION POWER - OFF
   UV COVER - OPEN (tb bp for<5 sec
   then gray if not gray in 15
   sec -off(ctr))
   UV ABSORPTION POWER - ON
   Monitor SYSTEMS TEST METER PNL 101
   If meter < 2.0v tell DP to pitch
   S/C down
   If meter > 3.0v tell DP to pitch
   S/C up

   If meter oscillating S/C is >1.5
   DEG off center of FOV of
   startracker in yaw or 3 DEG
   in pitch

   PITCH CALIBRATION
   Help DP track star by calling out
   voltage and direction
   DP will MNVR S/C such that SYSTEMS
   TEST MTR is centered (2.5v)
   DP will Observe where star is
   located in the COAS
   Mark this position on COAS chart
   page 10-7

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5. YAW CALIBRATION
DP will yaw S/C left then
Give mark when meter oscillates
mark star position on COAS chart
DP will yaw S/C right and acquire star
Give mark when meter oscillates
mark star position on COAS chart

6. PNL 230
UV ABSORPTION POWER - OFF
UV COVER - CLOSE (tb bp for<5 sec then gray, if not gray in 15 sec - off(ctr))
UV ABSORPTION POWER - ON
EXPERIMENT COVERS ARM/SAFE - SAFE

7. Enable all RCS jets (16)
PNL 1
SC CONT - CMC
MAN ATT (3) - RATE CMD

8. Correct COAS chart for parallax

150m pitch tracking point is .8 DEG below and .3 DEG to the right of pitch calibration point

500m pitch tracking point is .2 DEG below and .1 DEG to the right of pitch calibration point

1000m use pitch calibration point

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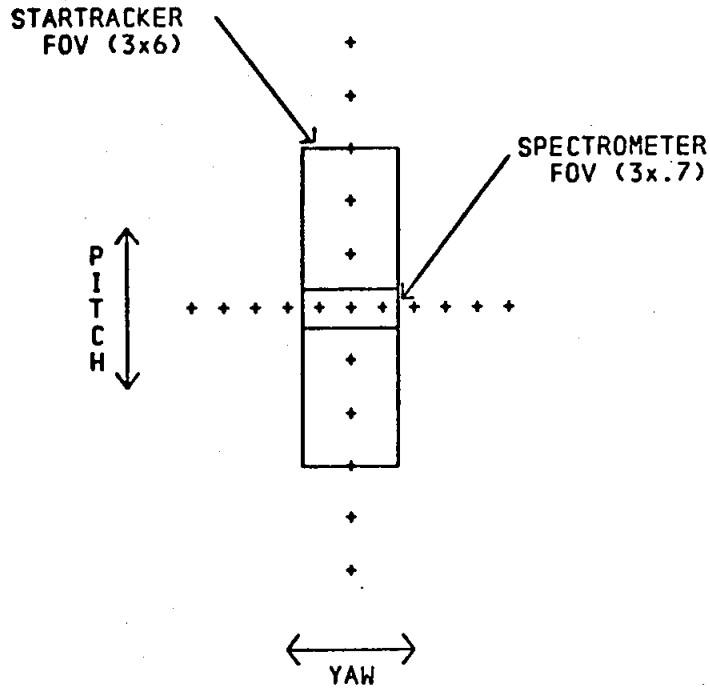
UVA_SHUTDOWN

PNL 230
UV ABSORPTION LAMPS - OFF
UV ABSORPTION POWER - OFF
UV COVER - CLOSE (tb bp <5 sec
then gray, if not gray in 15
sec - off(ctr))

UVA_STOW

Obtain DRAG THRU POWER UMBILICAL
BAG(A1)
DISCONNECT cable and place
in bag
Stow bag in DM JETTISON STOWAGE
BAG

COAS RETICLE



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SOYUZ REFLECTOR COVER FAILURES

1) IF SOYUZ SIDE REFLECTOR COVER DOES NOT OPEN:

   A. INFORM SOYUZ: YOUR SIDE REFLECTOR COVER IS CLOSED. PERFORM BACKUP AS-5 ORIENTATION AS PROGRAMMED.
   Ваша крышка бокового отражателя закрыта. Выполните резервную ориентацию АС-5 по программе.

   B. THE 150M TRAJECTORY WILL BE FLOWN AS PLANNED BUT NO DATA CAN BE OBTAINED.

   C. BEFORE THE 500M DATA TAKE SOYUZ WILL YAW TO POINT THE AFT REFLECTOR NORTH SO IT MAY BE USED FOR THE 500M DATA TAKE.

   D. AFTER THE 500M DATA TAKE THE SOYUZ WILL YAW TO THE NOMINAL ATTITUDE SO APOLLO CAN BE VIEWED RETURNING TO THE IN PLANE STATIONKEEPING POSITION.

   E. THERE IS NO CHANGE TO THE 1000M IN PLANE PROCEDURES.

2) IF SOYUZ TOP FACING REFLECTOR COVER DOES NOT OPEN, FOLLOW NOMINAL PROCEDURES BUT NO DATA CAN BE OBTAINED ON 1000M TRAJECTORY.

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