

CB/A. Forostenko

JSC - 09146

ASTP

FINAL

PCN-1

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

# EXPERIMENTS CHECKLIST

PREPARED BY  
PROCEDURES BRANCH  
CREW TRAINING & PROCEDURES DIVISION



National Aeronautics and Space Administration  
**LYNDON B. JOHNSON SPACE CENTER**

Houston, Texas

JUNE 23, 1975

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PCN-1  
EXPERIMENTS CHECKLIST

JUNE 23, 1975

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

Distribution of this document is controlled by Ted A. Guillory, CG54, 483-4271.

ACKNOWLEDGEMENT

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## CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT

Experiments

CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
001	Final	5/16/75	
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003	Final	5/16/75	
004	Final	5/16/75	
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022	Final	5/16/75	
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024A	Final	5/16/75	
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## CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT

ExperimentsCHECKLIST

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047	PCN-1	6/23/75	200
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		Jan17	100
		Jan17	200
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		Feb17	400
		Feb17	500
		Feb17	600
		Feb17	700
		Feb17	800
		Feb17	900
		Feb17	100
		Feb17	110
		Feb17	120
		Feb17	130
		Feb17	140
		Feb17	150
		Feb17	160
		Feb17	170
		Feb17	180
		Feb17	190
		Feb17	200
		Feb17	210
		Feb17	220
		Feb17	230
		Feb17	240
		Feb17	250
		Feb17	260
		Feb17	270
		Feb17	280
		Feb17	290
		Feb17	300
		Feb17	310
		Feb17	320
		Feb17	330
		Feb17	340
		Feb17	350
		Feb17	360
		Feb17	370
		Feb17	380
		Feb17	390
		Feb17	400
		Feb17	410
		Feb17	420
		Feb17	430
		Feb17	440
		Feb17	450
		Feb17	460
		Feb17	470
		Feb17	480
		Feb17	490
		Feb17	500
		Feb17	510
		Feb17	520
		Feb17	530
		Feb17	540
		Feb17	550
		Feb17	560
		Feb17	570
		Feb17	580
		Feb17	590
		Feb17	600
		Feb17	610
		Feb17	620
		Feb17	630
		Feb17	640
		Feb17	650
		Feb17	660
		Feb17	670
		Feb17	680
		Feb17	690
		Feb17	700
		Feb17	710
		Feb17	720
		Feb17	730
		Feb17	740
		Feb17	750
		Feb17	760
		Feb17	770
		Feb17	780
		Feb17	790
		Feb17	800
		Feb17	810
		Feb17	820
		Feb17	830
		Feb17	840
		Feb17	850
		Feb17	860
		Feb17	870
		Feb17	880
		Feb17	890
		Feb17	900
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EXPERIMENTS CHECKLIST

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NOTE

Due the necessity for simultaneous scheduling of some experiments the flight copy of this book is divided into two volumes. Volume I contains the experiment procedures listed above and volume II contains the remainder of the solo phase experiment procedures.

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ELECTROPHORESIS TECHNOLOGY (MA011)

ETE PREP (USA)

1. Obtain from A6  
ELECTROPHORESIS CABLE, ETE BRACKET,  
COLUMN COVER (in the same bag)  
INTERVALOMETER, 80mm LENS, EXTENDER  
PNL 5  
cb AC UTIL (3) - close  
PNL 201  
AC UTIL PWR - OFF(verify)  
Connect cable to J1 and route across  
LEB to ETE use clips  
Connect cable to ETE (POWER, bottom)
2. Lift cover and lock - (calfax(2))  
Verify on ETE  
POWER - OFF  
TEMP SELECT - OFF  
MODE SELECT - OFF  
SPACER - DISENGAGED  
Disconnect light cable from launch  
stowage connector and connect to ETE
3. Remove light assy and velcro to lid  
(top velcro patch)  
Attach light shield to lid (bottom  
velcro patch)  
Obtain COLUMN COVER and velcro to ETE  
PNL 201  
AC UTIL POWER - ON  
ETE  
Verify fluid connects are connected  
to ETE  
POWER - ON  
MODE SELECT - ELECTRO

DATE

ELECTROPHORESIS  
TECH (MA011)

BACK

COLOR \_\_\_\_\_

1-6

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ELECTROPHORESIS  
TECH (MA011)

4. Attach bracket to ETE cover  
Configure HDC(B3) (black)  
Attach extender to camera  
Attach 80mm lens to extender  
(f3.5,1/15,INF) and mag CX19(U1)  
For sample #1 thru #4 install mag  
CX19(U1)  
For sample #5 thru #8 install mag  
CX20(U1)  
Attach camera to BRKT  
Attach IVL to camera and set to 180  
Verify lamp cable not in camera FOV
5. Obtain CRYO FREEZER and place near ETE
6. WAIT 2 min  
ETE  
MODE SELECT - OFF  
WAIT 2 min

1-7

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ETE OPS SAMPLE \_\_\_\_ (per FP)

1.

POWER - OFF

Remove a swab from the column bag and  
swab electrode connections on ETE

POWER - ON

Inspect column for leakage if column is  
leaking discard and use next number  
column and sample

Remove column from bag by cutting bag  
with scissors

Place column on thermoelectric cradle

SPACER - (see TABLE 1 pg 1-8)

COLUMN COVER - (see TABLE 1)

Attach column holddown arm

Connect fluid tubes to column

Samples 4 and 8 do not have any fluid  
connections

Inspect & clean ETE airflow screen

2.

ETE

CURRENT SELECT - (see TABLE 1)

TIME SELECT - (see TABLE 1)

3.

NOTE - Do not leave freezer cap off for  
more than 40 seconds or the  
freezer insert extended for  
more than 15 sec

Remove sample from CRYO FREEZER and  
seat sample slide against the blank  
slide and firmly push into column  
until slide bottoms out then replace  
freezer cap

WAIT 10 MIN then continue

TEMP SELECT -(see TABLE 1)

COLUMN TEMP - Verify +10 to 12 deg C  
for samples 2,3,6 & 7 only

1-8

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4. INTERVALOMETER - ON  
ETE  
    MODE SELECT - (see TABLE 1)  
    Set portable timer to 60 min (45 for sample 4 and 8)
5. For samples 1,2,3,5,6,7 only  
Observe column (at 60 MIN)  
    NOTE- For first and fifth samples inform STDN of location and shape of bands at 60 minutes at next station pass  
    Reset portable timer to 15 min

TABLE 1

SAMPLE	1.5	2.6	3.7	4,8	
SPACER	ENGAGE	DISENGAGE	ENGAGE		
TIME SELECT	75	75	75	45	1
CURRENT SELECT	HI	HI	HI	LO	
TEMP SELECT	OFF	COOL	COOL	OFF	
COLUMN COVER	OFF	ON	ON	OFF	
MODE SELECT	ELECTRO	ELECTRO	ELECTRO	ISOTACH	

## # SAMPLE NAME

- |     |                       |
|-----|-----------------------|
| 1,5 | FIXED RED BLOOD CELLS |
| 2,6 | LYMPHOCYTES           |
| 3,7 | KIDNEY CELLS          |
| 4,8 | FIXED RED BLOOD CELLS |

## ETE FREEZE

1. Observe column (at 75 MIN)  
NOTE- For first and fifth samples inform STDN of location and shape of bands at 75 minutes at next station pass
2. Run complete when S/C timer reads zero and COLUMN VOLTAGE near zero
3. ETE  
MODE SELECT - OFF
4. ETE  
Remove COLUMN COVER if on and velcro  
Detach intervalometer from cam(velcro)  
Cycle twice INTERVALOMETER OFF then ON  
  
For samples 1 and 5 only  
SPACER - DISENGAGE  
Seat column carefully on cradle  
  
Replace COLUMN COVER (DO NOT DISTURB COLUMN)  
Attach column holddown arm
5. ETE  
TEMP SELECT - FREEZE  
Set portable timer to 30 min

1-10

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ETE SHUTDOWN

1. After S/C timer reads zero  
Remove COLUMN COVER  
Cycle INTERVALOMETER OFF then on
  2. ETE  
TEMP SELECT - OFF  
POWER - OFF  
INTERVALOMETER - OFF
  3. Obtain tissue (A2) and remove fluid  
connects wipe up any excess fluid then  
attach to bypass  
Remove frozen column from ETE  
Obtain column wrench and twist off each  
electrode  
Place frozen column in CRYO FREEZER
- NOTE - Do not leave freezer cap off for  
more than 40 seconds or the  
freezer insert extended for  
more than 15 sec

1-11

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ETE TERMINATE

1. ETE

POWER - OFF

MODE SELECT - OFF

INTERVALOMETER - OFF

SPACER - DISENGAGE

Remove column assembly from ETE

Stow assembly in bag in ETE

2. For sample 8 only

PNL 201

AC UTIL PWR - OFF

Disconnect cable from ETE and PNL 201  
and stow in A6 bag

Stow HDC, film mag, lens and extender

Stow in one bag in A6

ELECTROPHORESIS CABLE, ETE BRACKET,  
COLUMN COVER

Disconnect light assy from ETE and stow  
in ETE

Stow light shield on ETE

Close and lock ETE COVER

Tighten CRYO FREEZER cover using tool E  
for reentry then stow

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X-RAY OBSERVATIONS (MA048)

X-RAY OPERATION

1. Verify X-RAY Attitude (FP)

2. PNL 230

X-RAY HV PWR - off (ctr) (verify)  
X-RAY COVER - OPEN (tb-bp<5 sec then  
gray - if not gray in 15 sec off(ctr))  
X-RAY LV PWR - ON(HV tb-bp)  
X-RAY HV PWR - 1 (HV tb-gray, if not, go  
X-RAY HV PWR - 2, tb should go gray,  
notify STDN)

X-RAY POWERDOWN

1. PNL 230

X-RAY PURGE - CAL(mom-hold for 30 sec)  
X-RAY HV PWR - off(ctr)(HV tb-bp)  
X-RAY LV PWR - OFF(HV tb-gray)  
X-RAY COVER - CLOSE (tb-bp<5 sec then  
gray - if not gray in 15 sec off(ctr)  
and do not maneuver before contacting  
STDN)

DATE

X-RAY OBSERVATIONS  
(MA048)

BACK



COLOR \_\_\_\_\_

1-22

DATE 6/23/75

X-RAY CAL/BACKGROUND

1. Wait for STDN cue

2. PNL 230

X-RAY COVER - CLOSE(verify)  
X-RAY HV PWR - off (ctr)(verify)  
X-RAY LV PWR - ON(HV tb-bp)  
X-RAY HV PWR - 1 (HV tb-gray, if not, go  
X-RAY HV PWR - 2, tb should go gray,  
notify STDN)

Wait 1 min and for STDN cue

X-RAY PURGE - CAL (mon-hold for 30 sec)

X-RAY PURGE

1. Verify X-RAY Attitude (FP)

2. PNL 230

HELIUM GLOW power sw - OFF (verify)  
He GLOW COVER - CLOSE (verify)  
EUV TELESCOPE power sw - OFF (verify)  
EUV COVER - CLOSE (verify)  
X-RAY COVER - OPEN (tb-bp<5 sec then  
gray - if not gray in 15 sec off(ctr)  
and do not proceed)  
X-RAY HV PWR - off (ctr)(verify)  
X-RAY LV PWR - ON (HV tb-bp)

X-RAY OBSERVATIONS  
(MA048)



1-23

DATE 6/23/75

3.PNL 230

X-RAY PURGE - START

Check X-RAY BACKUP PURGE tb. If it is bp  
perform the following contingency  
procedure

\*\*\*\*\*  
\* X-RAY BACKUP PURGE - OFF(mom)(tb-gray) \*  
\* Return to step 3, repeat once only and do\*  
\* not proceed if X-RAY BACKUP PURGE goes \*  
\* bp again \*  
\*\*\*\*\*

Wait 10 min

X-RAY HV PWR - 1 (HV tb-gray, if not, go  
X-RAY HV PWR - 2, tb should go gray,  
notify STDN)

X-RAY BACKUP PURGE

1.Verify X-RAY attitude (FP)

2.PNL 230

HELIUM GLOW power sw - OFF (verify)

He GLOW COVER - CLOSE (verify)

EUV TELESCOPE power sw - OFF (verify)

EUV COVER - CLOSE (verify)

X-RAY COVER - OPEN (verify)

X-RAY HV PWR - off(ctr)(verify)

X-RAY LV PWR - ON (HV tb-bp)

X-RAY BACKUP PURGE - ON (mom)(tb-bp)

Wait 5 min

X-RAY BACKUP PURGE - OFF (mom)(tb-gray)

Wait 10 min

X-RAY HV PWR - 1 (HV tb-gray, if not, go

X-RAY HV PWR - 2, tb should go gray,  
notify STDN)

1-24

DATE 5/16/75

\*\*\*\*\*  
\* X-RAY CONTINGENCY POWERDOWN \*  
\*  
\* Perform only as advised by STDN \*  
\*  
\* 1. PNL 230 \*  
\*     HELIUM GLOW power sw - OFF (verify) \*  
\*     He GLOW COVER - CLOSE (verify) \*  
\*     EUV TELESCOPE power sw - OFF (verify) \*  
\*     EUV COVER - CLOSE (verify) \*  
\*     X-RAY COVER - OPEN (verify) \*  
\*     X-RAY HV PWR - off(ctr)(verify) \*  
\*     X-RAY LV PWR - ON(HV tb-bp) \*  
\*     X-RAY PURGE - START (mom) \*

CAUTION

\* Perform next step immediately  
\* (within one min)

\* X-RAY LV PWR - OFF(HV tb-gray)  
\* Wait 15 sec  
\* X-RAY LV PWR - ON(HV tb-bp)  
\* Wait 5 min  
\* X-RAY COVER - CLOSE (tb-bp<5 sec then  
\*       gray)

\*\*\*\*\*

1-29

DATE 6/23/75

DM JETT PHOTOS (set up at approx DM Jett  
-30 min)

1. Photo setup

CM4/DAC(B3)/75mm(B3)/CT01(F2), DAC Timing  
Cable(A6), Mount(U2), MIR(B3),  
(T4, 1/125, infinity) 2fps(15%)

2 PNL 227

SCI INST PWR - OFF  
Connect DAC Timing Cable  
SCI INST PWR - PWR  
Cover lens and turn DAC - ON for 10 sec

3. Monitor DET and prepare to give voice mark  
at precise time of DAC - ON

DET

+01:00 DAC - ON (voice mark)

+08:00 DAC - OFF

4. Cover lens and turn DAC - ON for 10 sec

5. Log photo data:

GET \_\_\_:\_MAG ID\_\_\_\_percent rem\_\_\_\_\_

1-30

DATE 5/16/75

DOPPLER SHUTDOWN (DM Jett +18 hrs)

1. PNL 230  
DOPPLER RECEIVER - OFF
2. PNL 274  
cb UV/DOPPLER MNA -open
3. Disconnect recorder cable and stow  
recorder and cable in A6 (Stow recorder  
with rotation axes of reels lying  
parallel to YZ plane)

1-33

DATE 6/23/75

SAM OPERATIONS (SUNSET)

1. Verify SAM attitude (FP)
2. Set DET counting up to SAM START time (FP)
3. Photo setup:  
HH/HRC(B5)/250mm(B5)/IR01,IR02(U1)/  
IR filter(black)(B5),IVL(A6) 2.5 sec  
(f45,1/500,infinity)36FR  
Install IR01 for first Sunset/Sunrise  
pass and IR02 for second
4. At SAM START time (FP):  
0:00 SCI INST - ON (PNL 227)(verify)  
Configure DSE (HBR/RCD/FWD/CMD RE-  
SET)  
Prepare to give voice mark  
Dim S/C LTS  
Hold camera lens flush against  
window  
0:40 V22N79 (+00300) E  
1:00 IVL - ON (voice mark)  
2:30 IVL - OFF (voice mark)  
3:00 S/C LTS ON  
DSE STOP  
CMC MODE - FREE  
V22N79(+00050)  
CMC MODE - AUTO
5. Log photo data:  
GET \_\_\_\_ : MAG ID \_\_\_\_ Frame Count \_\_\_\_  
Voice frame count to ground at next STDN  
pass

1-34

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SAM OPERATIONS (SUNRISE)

1. Verify SAM attitude (FP)
2. Set DET counting up to SAM START time (FP)

3. Photo setup:

HH/HRC(B5)/250mm(B5)/IR(U1)/IR filter  
(black)(B5)/IVL(A6) 2.5 sec  
(f45,1/500,infinity)12FR

4. At SAM START time (FP):

0:00 SCI INST - ON (PNL 227)(verify)  
Prepare to give voice mark  
Dim S/C LTS  
Hold camera lens flush against  
window

0:30 V22N79 (+00300)E  
IVL - ON (voice mark)  
1:00 IVL - OFF (voice mark)  
2:30 CMC MODE - FREE  
V22N79(+00050)  
CMC MODE - AUTO  
3:00 S/C LTS ON

5. Log photo data:

GET \_\_\_ : \_\_\_ MAG ID \_\_\_ Frame Count \_\_\_  
Voice record frame count  
Install IR02 after first Sunrise pass

1-41

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LIGHT\_FLASH\_(MA106)

**LIGHT FLASH SETUP**

1. Install window shades
2. Unstow from D4:  
Power & Logic Unit  
Mask pouches (2)
3. Open recorder door in end of Power & Logic Unit and check that recorder head is securely locked onto cassette by pressing recorder head onto cassette
4. Attach Power & Logic Unit to MDC2 with straps and snaps on unit  
Snap detectors to outboard side of X-X head struts according to color code with colored side down (toward -X). Tape each to strut in two places  
Temporarily restrain masks and PB's on appropriate couches according to color code  
Connect detector, PB, and mask cables to Power & Logic Unit according to color code  
PNL 6 & 9  
POWER - OFF  
SUIT POWER - OFF  
Disconnect comm carrier from CWG adapter and connect MA106 LWHS's  
Temporarily stow mask pouches
5. Power & Logic Unit sw configuration:  
MODE SELECT - STANDBY  
DARK ADAPT LEVEL sel - 1  
POWER - OFF

LIGHT FLASH  
(MA106)

DATE

BACK



COLOR \_\_\_\_\_

SERIAL #740

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DATE 6/23/75

LIGHT FLASH  
(MA106)

6. PNL 100  
    UTILITY POWER - OFF  
    Connect Power & Logic Unit Power Cable  
        to utility outlet  
    UTILITY POWER - ON
7. Obtain Voice Recorder and two LIGHT FLASH  
    Cassettes(A4)
8. Install TAPE 1 in Recorder and put TAPE 2  
    in pocket
9. Restrain Recorder to MDC above head of  
    center couch
10. Camera Setup:  
    HH/NK(B2)/35MM(B2)/CI(B2),FLASH(B5)  
    (f11,1/60,focus)4FR  
    (Refer to INTERIOR PHOTOS cue card)  
    Locate camera at least 3 ft from detector  
    Focus  
    Photo each detector from two slightly  
    different positions for stereo coverage

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LIGHT FLASH OPERATION (OPERATOR)

1. At LIGHT FLASH START TIME (T) (FP) start chronograph and perform the following:  
Power & Logic Unit POWER - ON (pwr lt on)  
Wait 10 sec  
MODE SELECT - DARK ADAPT INITIATE (rcdr lt flashes every 8 sec for 24 sec)

Record GET \_\_\_\_:\_\_

2. Follow timeline below and on subsequent pages using chronometer and portable timer

T+time	INSTRUCTION
HR MIN	
1 + 00	PNL 98 POWER - OFF SPKR/HDST - HEADSET Don Panel 10 COMM Carrier PNL 6 & 9 SUIT PWR - on(up) POWER - AUDIO/TONE MODE - VOX VOX SENS - as req'd (~7) Start Voice Recorder Voice mark GET on Recorder Ingress couch and don headset
1 + 10	Instruct subjects to ingress couches, don masks and take PB's in hand  MODE SELECT - STANDBY(CCW) MODE SELECT - DARK ADAPT INITIATE(CW) (rcdr lt flashes every 8 sec for 24 SEC)

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1 + 10 Log GET  
(cont'd) Turn lights down

After 1 min begin dark adaptation level tests as follows with DARK ADAPT LEVEL sw and crewman select sw (RED CREW/BLUE CREW):

Test each subject at level 1 by pressing crewman sel sw 5 times at 1 sec intervals. When all 5 pulses are seen level has been reached. If level 1 has not been reached test crewmen individually at 1 min intervals until it has been reached.

Proceed similarly with subsequent levels. When a new level has been reached begin testing immediately for subsequent levels.

1 + 20 MODE SELECT - DET 1

1 + 30 Instruct observers to straighten heads in couches with faces up, begin observations.  
Flip Voice Recorder cassette.  
Start Recorder.  
Voice mark GET.

1 + 40 MODE SELECT - DET 2

1 + 55 MODE SELECT - DET 3

2 + 00 Change Voice Recorder cassette.  
Start Recorder.  
Voice mark GET.  
Put used cassette in pocket.

2 + 10 MODE SELECT - DET 4

TESTING STAD

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- 2 + 30 Flip Voice Recorder cassette.  
Start Recorder.  
Voice mark GET.
- 3 + 00 MODE SELECT - thru STANDBY to DARK  
ADAPT INITIATE  
Wait 30 sec  
Power & Logic Unit POWER - OFF  
Inform subjects test is complete.  
Stop Voice Recorder.

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LIGHT FLASH SHUTDOWN

1. PNL 100  
UTILITY POWER - OFF  
Disconnect Power & Logic Unit Power cable, coil and secure to unit with straps.
2. PNL 6 & 9  
POWER - OFF  
SUIT POWER - OFF  
Remove mask cables from CWG-adapter and connect comm carriers  
SUIT POWER - on(up)  
POWER - AUDIO/TONE  
MODE - INTERCOM/PTT
3. Obtain mask pouches from temporary stowage.
4. Disconnect masks from Power & Logic Unit and stow in mask pouches.
5. Remove data cassette and cassette container from Power & Logic Unit. Stow cassette in container. Stow container in a mask pouch.
6. Disconnect Detector Boxes from cables and stow in mask pouches. Coil and secure PB and detector cables to Power & Logic Unit with cassette container straps.
7. Remove TAPE 2 from Voice Recorder, TAPE 1 from pocket, and stow in mask pouches.
8. Stow Voice Recorder in A4.

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9. Stow Power & Logic Unit and Mask Pouches  
in D4.

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## CM HEIGHT MEASUREMENTS

### SEATED HEIGHT

1. Put center couch in 90 deg configuration with foot restraints deployed
2. Subject ingress couch, sit erect, and pull buttocks firmly against seat pan while maintaining back contact with couch
3. Observer obtain meas tape (A6) and measure (inches) from top of couch support frame to top of subjects head along plane of couch (log next page)

### RELAXED EYE HEIGHT

DATE

1. Put center couch in 180 deg configuration, foot restraints stowed
2. Subject closes eyes, relaxes to zero-g posture
3. Observer positions subject's back against couch back and slides subject down until subject's toes or feet contact LEB bulkhead
4. Observer obtain meas tape (A6) and measure (inches) from top of couch support frame to subject's eye level along horizontal plane of couch back (log next page)

HEIGHT  
MEASUREMENTS

BACK



COLOR \_\_\_\_\_

1-60 REC

DATE 5/16/75

CM MEASUREMENTS

AC:

GET		
SEATED HT		
REL EYE HT		

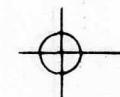
CP

GET		
SEATED HT		
REL EYE HT		

DP

GET		
SEATED HT		
REL EYE HT		

HEIGHT  
MEASUREMENTS



1-61

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## DM HEIGHT MEASUREMENTS

### ERECT HEIGHT

1. Subject assume supine position against DM panel with feet toward SOYUZ end. Assume maximum erect posture with feet perpendicular to body axis and pull body toward hatch until balls of feet are in firm contact with hatch with heels touching panel.
2. Observer measure top of head height using meas decal and log on next page.  
NOTE: Checklist may be used at crewman's option as a square edge for measurement.

### RELAXED EYE HEIGHT

1. Subject closes eyes, relaxes to zero-g posture.
2. Observer positions subject's back against DM panel and slides subject down until subject's toes or feet contact flat surface of SOYUZ-end hatch.
3. Observer measure eye height using meas decal and log on next page.  
NOTE: Checklist may be used at crewman's option as a square edge for measurement.

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DM MEASUREMENTS

AC:

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

1-65

DATE 6/23/75

FISH EXPERIMENT (MA161)

1. DAC SETUP

HH/DAC/10mm(F1.8, 1/125, 9'') 12fps

PORATABLE LIGHT, MAG CI28 (F2)

LOG mag ID and % remaining

DAY 2	DAY 8
DAY 6	DAY 9
DAY 7	

Mount portable light on DAC

2. DAY 2 ONLY

Unstow FISH EXPERIMENT (A6)

Mount the fish package on LEB wall  
below optics

Set DAY counter

3. AFTER DAY 2 in DM

Mount both fish packages on DM wall  
behind hatch 2

4. DAY 2 ONLY hold camera body 9'' from fish

PORATABLE LIGHT - HI

Photo for 15 sec each compartment of fish  
Observe fish and log comments

5. AFTER DAY 2

U-mount ( $x=10, y=265, z=310$ )

Mount DAC ON 874 pin in hole 1

Obtain both packages from DM wall

Set DAY counter

PORATABLE LIGHT - HI

DATE

FISH EXPERIMENT  
(MA161)

BACK



COLOR \_\_\_\_\_

FISH EXPERIMENT  
(MAT61)

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Photo for 15 sec each compartment of fish  
by holding fish package bottom flush  
with handrail and package square with  
lens

Photo each egg compartment for 5 sec

PORTABLE LIGHT - OFF

Observe fish and log comments

6. LOG mag ID and % REMAINING

DAY 2	DAY 8
DAY 6	DAY 9
DAY 7	

7. DAY 8 ONLY NIKON setup

HH/NK/35/CI/CRYSTAL GROWTH FRAMING

DEVICE (f2.8, 1/15, 1') 6FR

Mount PORTABLE LIGHT at PL4 facing egg  
package

PORTABLE LIGHT - HI

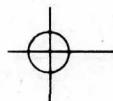
Take 6 FR of egg package

PORTABLE LIGHT - OFF

8. DAY 2 and DAY 9 ONLY

Repack and stow both packages in A6

DO NOT UNPACK OR OPEN THE BAGS UNTIL  
THE FISH ARE IN THE CRYSTAL GROWTH FRAMING  
AND THE CRYSTAL GROWTH FRAMING IS  
SECURELY ATTACHED TO THE PORTABLE LIGHT.  
DO NOT TURN ON THE PORTABLE LIGHT  
UNTIL THE CRYSTAL GROWTH FRAMING IS  
SECURELY ATTACHED TO THE PORTABLE LIGHT.  
DO NOT TURN ON THE PORTABLE LIGHT  
UNTIL THE CRYSTAL GROWTH FRAMING IS  
SECURELY ATTACHED TO THE PORTABLE LIGHT.



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### ORIENTATION OF FISH (ESTIMATE NUMBERS)

1-66B

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### ORIENTATION OF FISH (ESTIMATE NUMBERS)

1-66C

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### HATCHING ACTIVITY OF EGGS (ESTIMATE %)

1-66D

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#### HATCHING ACTIVITY OF EGGS (ESTIMATE %)

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## WICKING DEMONSTRATION

1. Unstow WICKING DEMONSTRATION, FOAMING DEMONSTRATION, LIQUID SPREADING SYRINGE AND AMPULE, and LIQUID SPREADING CUBES from (A6), FOOD TRAY (A-2), TISSUE DISPENSER, DAC MAGS CI25, CI26, CI27(F2) SCISSORS, FECAL BAG
2. Tape food tray on DM floor between hand rails on top of PNL 826 rear of tray touching PNL 828
3. DAC set up in DM  
DAC02/MAG(CI25)/25mm(F2.0,1/60,18')  
12 fps, U-mount(x=020,y=265,z=270)  
Mount DAC02 in brkt 874 (pin in hole 1)  
Verify DAC operation (2 sec)  
Velcro portable light on floor next to tray at 45 deg angle  
TV PREP  
Verify TV at 873  
Set cam - MASTER  
 $U=MOUNT(x=80,y=170,z=60)$ (pin in hole 4)  
CAM SETTINGS(f=3.5,zoom=9,foc=10)  
PNL 808  
CAMR SYNC - CM/DM  
TV STATION SEL - DM/DM1  
DM1 TV STATION POWER - ON  
PNL 181  
CM/DM CAMR - POWER  
TV STATION SEL - REMOTE
4. Obtain WICKING DEMONSTRATION  
Mount baseplate on food tray(third velcro row)
5. Obtain yellow syringe attach yellow ampule  
Fill baseplate with water holding syringe vertical
6. PORTABLE LIGHT - HI  
DAC - ON

WICKING DEMONSTRATION

BACK



COLOR \_\_\_\_\_

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WICKING  
DEMONSTRATION

PNL 400

VTR PWR (3) - ON

HEAD WHEEL DRIVE MOTOR - ON

MODE - RECORD

7. Place wicking assembly 1 onto baseplate
8. After wicking has proceeded halfway or 3 min duration: Remove wicking assembly and discard (fecal bag)
9. Repeat steps 7. thru 8. for wicking assembly 2
10. DAC - OFF  
PNL 400  
HEAD WHEEL DRIVE MOTOR - OFF
11. Clean baseplate with tissues and place back on tray
12. Obtain black syringe attach black ampule  
Fill baseplate with oil from syringe
13. DAC - ON
14. Place wicking assembly 3 onto baseplate
15. After wicking has proceeded halfway or 1 min duration: Remove wicking assembly and discard (fecal bag)
16. Repeat steps 14. thru 15. for wicking assembly #4
17. DAC - OFF
18. Clean baseplate with tissues and discard  
Repack all wicking equipment and discard

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LIQUID SPREADING DEMONSTRATION

1. Obtain LIQUID SPREADING CUBE (3) and LIQUID SPREADING SYRINGE AND AMPULE
2. Install mag CI26 on DAC (6fps)
3. Remove boxes by unsnapping lid and position on tray with dots toward DAC (large box near DAC on third velcro row)
4. Obtain large syringe attach large ampule  
Obtain small syringe attach small ampule  
Remove needle caps
5. DAC - ON  
PNL 400  
HEAD WHEEL DRIVE MOTOR - ON  
MODE - RECORD
6. Use large syringe to deposit 10ml oil gently in the form of a large drop at the center of the bottom surface (large box)  
Observe spreading for 1 min or until drop ceases to spread  
Repeat this step using 5ml of oil
7. Move large box away from DAC move medium box near DAC  
Repeat steps 6. for medium box
8. Use small syringe to deposit 5cc of soapy water at the center of the bottom surface of medium box
9. Observe for 1 min

DATE

LIQ SPREADING  
DEMONSTRATION

BACK



COLOR \_\_\_\_\_

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10. Move medium box away from DAC and move small box near DAC
  11. Deposit 5ml of oil from large syringe on anvil shape in bottom of small box  
Observe for 1 min then add 5ml of oil on anvil shape in bottom of small box  
Observe for 1 min
  12. Move small box away from DAC and move lid (velcro down) near DAC
  13. Deposit 5ml of soapy water from small syringe onto center of lid  
Observe for 1 min then add 5ml of oil from large syringe onto center of lid  
Observe for 1 min
  14. DAC - OFF  
PNL 400  
HEAD WHEEL DRIVE MOTOR - OFF
  15. Remove boxes from food tray  
Clean all boxes with tissues  
Repack all LIQUID SPREADING DEMONSTRATION equipment and discard

LIQ SPREADING  
DEMONSTRATION

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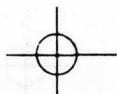
FOAMING DEMONSTRATION

1. Unstow CHEMICAL FOAMS DEMO and unfold
2. Log color of liquid crystals  
(1= , 2= , 3= , 4= )  
Inform STDN next pass
3. Install mag (CI27) and remote cable
4. DAC - ON(remote)  
PNL 400  
TV HEAD WHEEL DRIVE MOTOR - ON  
MODE - RECORD
5. Take tube #1 and shake vigorously and  
velcro (third row) for 20 sec  
Repeat for tube #2  
Place tube 1 & 2 back in bag
7. DAC - OFF(remote)
8. Attach ampule 7 to any syringe and inject  
1.0ml into tubes 3,4, and 5  
Inject into tube 6 remaining fluid  
Discard syringe
9. Attach ampule 8 to any syringe and inject  
.5ml into tubes 3,4, and 5  
Inject 1.0ml into tube 6  
Discard syringe
10. Remove tube 3 from bag and attach ampule  
9 to any syringe  
DAC - ON(remote)  
Inject contents of syringe into tube 3

DATE

FOAMING  
DEMONSTRATION

BACK



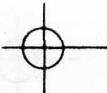
COLOR \_\_\_\_\_

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11. Shake vigorously (3-5 sec) tube #3  
Velcro tube #3 in front of DAC until  
color changes (20-40 sec)  
DAC - OFF(remote)  
Discard tube 3
12. Remove tube 4 and attach ampule 10 to  
any syringe  
DAC - ON(remote)  
Inject contents into tube 4
13. Shake vigorously (3-5 sec) tube 4  
Velcro tube 4 in front of DAC until  
color changes (20-40 sec)  
DAC - OFF(remote)  
Discard tube 4
14. Remove tube 5 and attach ampule 11 to  
any syringe  
DAC - ON(remote)  
Inject contents into tube 5
15. Shake vigorously (3-5 sec) tube 5  
Velcro tube 5 in front of DAC until  
color changes (40-60 sec)  
DAC - OFF(remote)  
Discard tube 5
16. Remove tube 6 and attach ampule 12 to  
any syringe  
DAC - ON(remote)  
Inject contents into tube 6
17. Shake vigorously (3-5 sec) tube 6  
Velcro tube 6 in front of DAC until  
color changes (20-40 sec)  
DAC - OFF(remote)  
Discard tube 6

FOAMING  
DEMONSTRATION



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18. PORTABLE LIGHT - OFF  
PNL 400  
HEAD WHEEL DRIVE MOTOR - OFF  
POWER TELEMETRY - OFF  
POWER INTERLEAVER - OFF  
POWER VTR - OFF  
PNL 808  
DM1 TV STATION POWER - OFF
19. Discard demo
20. Remove food tray from DM and stow in CM  
Stow DAC mags used in D3

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## MSFC SCIENCE DEMONSTRATION

### CAPILLARY WICKING

PI: Ms Ann Whitaker, MSFC

### OBJECTIVE

To demonstrate the wicking phenomena in stainless steel and durell cloth wicks in zero gravity.

### CONCEPT

In this demonstration the wicking rates of three stainless steel and one cloth wick will be demonstrated. A water-soap solution dyed blue for visibility will be used. The soap is added to lower the surface tension in order to more nearly simulate actual spacecraft propellants. In zero gravity a much faster rate of wicking is anticipated since the force of gravity is not available to oppose the capillary action.

The wicking action up the brown cloth should proceed fastest since it has the finest capillaries. The wicks differ from each in the pattern in which they are woven as well as the spacing in the weave. These wicks are actually woven in order to assure that the capillary paths will be unobstructed.

The second fluid used is an oil commonly used in car and wood polishes, suntan lotion and handcreams. The oil has an even lower surface tension than water-soap solution and

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should wick faster than the water-soap.

### BENEFITS

Capillary action has many common applications. It is well known that oil rises in lamp wicks and melted wax rises in the wick of a candle. On the industrial scale, wicks are currently used to clean up oil spills and for tertiary oil recovery where a low surface tension fluid is forced into an oil bed to displace the oil from cracks and crevices where a high percentage of oil might otherwise remain untapped. Capillary wicking has been employed in spacecraft in the fuel/cryogen containment of fluids and propellant expulsion.

### LIQUID SPREADING

PI:Dr. Sidney Bourgeois, Lockheed

### OBJECTIVE

To demonstrate the behavior of certain fluids spreading over both solid and liquid surfaces in space.

### CONCEPT

The fluids used in this demonstration are the same as the wicking demonstration. The oil will be placed on the bottom surface of the box and the spreading will be observed. The box is treated at the top so the oil will not spread out of the box. The second box is treated so that the fluid will not collect in

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the corners of the box. The fluid spreading will be observed. Some water is placed on top of the oil and the spreading is observed again. As on earth, the water should spread over the oil, but unlike earth where the water should sink into the oil, in space it should lie in top of the oil. If the edges of the water drop can be seen, the oil will be spreading over the water.

In the third box oil will be placed onto a small anvil at the bottom of the box. The question here is whether the oil will spread over the obtuse angle or only down the sides which form a right angle with the top.

#### BENEFITS

The evenness which an insecticide might spread over leaves, the rapidity and evenness with which heated solder spreads, the uniformity in the layers of chemicals on a photographic negatives, and the even coatings of laminated electronic circuits are just some of the benefits of this demonstration.

#### CHEMICAL FOAMS

PI:Dr. Philomen Grodzda, Lockheed

#### OBJECTIVE

To demonstrate the formation and stability of liquid foam mixtures and the rate of chemical reactions in foam in zero gravity.

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### CONCEPT

The stability of a foam will be demonstrated by shaking a small tube containing a chemical indicator. The indicator turns pink in a foamed state while the bulk of the liquid remains a golden brown. The difference in color will determine the rate at which the foam dissipates.

The second part of the demonstration illustrates the influence of a stable or long persisting foam on the reaction time of a 'clocked' chemical reaction. The reaction is formed by adding prepared solutions of sodium sulfite and sodium metabisulfite, formaldehyde, and phenolphthalein indicator together. After a period of time depending on the concentration, temperature, and alkalinity the colorless solution suddenly turns a deep red.

### BENEFITS

The results of this demonstration will illustrate that foams can be used to change the rate of particular chemical reactions. It is anticipated that in the future such zero-gravity-influenced foams can be used as media in which to conduct chemical reactions, changing not only the rates, but possibly also the end products.

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## KILLIFISH HATCHING ORIENTATION EXP(MA161)

PI: W. SCHELD, JSC

### OBJECTIVE

The objective of this experiment is to observe the orientation behavior in zero gravity, and to evaluate the gravity dependence of sensory structure functional development during embryogenesis of killifish.

### CONCEPT

This experiment consist two packages of five compartments. One package contains fish eggs in various states of development. These eggs range from 36 hours after fertilization to 14 days after fertilization. The fish package consists of 10 fish per compartment which have been preconditioned to various backgrounds. Sequence photographs will be taken on day 2,6,7,8, and 9 of the mission to record the fish behavior. Crew comments on the fish behavior will also be made.

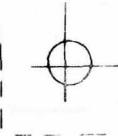
### BENEFITS

This experiment will confirm observations which suggest that vestibular development may be arrested in embryos developing under conditions of weightlessness. If this observation is confirmed in the Fundulus system and can be extended to higher animals, it has important implications for future missions in which developing biological systems are exposed to weightlessness during critical periods of development.

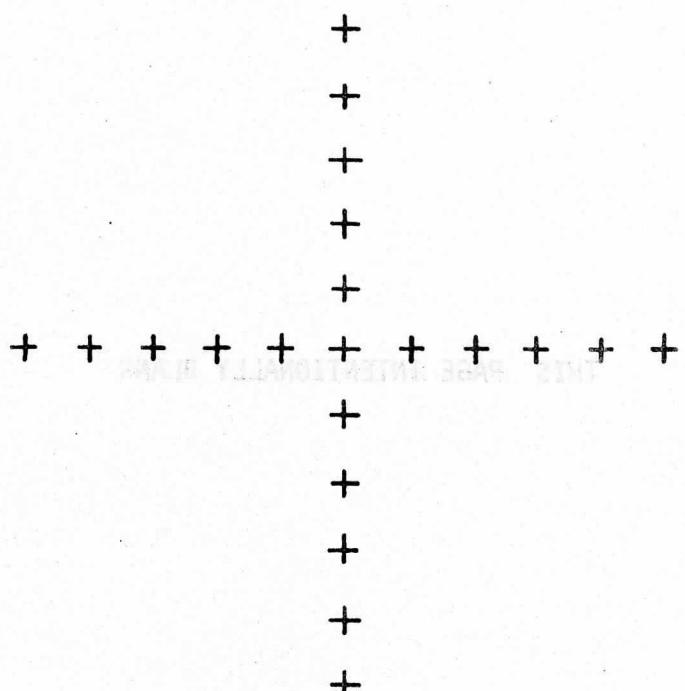
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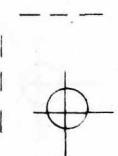
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