ASTP	
EXPERIMENTS CHECKLIST	
PART NO.	S/N
SKF 32100114 - 110	1002

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EXPERIMENT NARRATIVES

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EXPERIMENT OPERATIONAL CONSTRAINTS

SM EXPERIMENT ACTIVATION

1. Verify SM EXPERIMENTS ACTIVATION attitude (FP)

2. PNL 230
   HELIUM GLOW power sw - OFF(ctr)(verify)
   EUV TELESCOPE power sw - OFF(verify)
   X-RAY HV PWR - off(ctr)(verify)
   X-RAY LV PWR - OFF(verify)

3. PNL 274
   cb ELECTROPHORESIS/COVERS MNA and MNB - close (verify)
   cb He GLOW MNB - close
   cb EUV MNB - close
   cb X-RAY MNA - close

4. PNL 230
   UV COVER - CLOSE
   He GLOW COVER - CLOSE
   EUV COVER - CLOSE
   X-RAY COVER - CLOSE
   cb EXPERIMENT COVERS MNA and MNB - close (verify)

CAUTION

In the following, if any COVER tb is bp put that COVER sw to off(ctr) immediately and contact STDN

EXPERIMENT COVERS ARM/SAFE sw - ARM
UV COVER - tb gray (verify)
He COVER - tb gray (verify)
EUV COVER - tb gray (verify)
X-RAY COVER - tb gray (verify)

DATE _____

EXPERIMENT COVERS TIE DOWN RELEASE sw-
RELEASE (mom)
Prepare to give voice marks
X-RAY COVER - OPEN - give voice mark - (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) and do not proceed)
He GLOW COVER - OPEN - give voice mark - tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) and do not proceed)
EUV COVER - OPEN - give voice mark - (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) and do not proceed)
Wait 1 min
HELIUM GLOW power sw - ON
EUV TELESCOPE power sw - POWER
EUV TELESCOPE detector sw - DET 2 (mom)
X-RAY LV PWR - ON(HV tb-bp)
Wait 5 min

5.PNL 230
EUV TELESCOPE power sw - OFF
EUV COVER - CLOSE - give voice mark - (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) and do not maneuver or proceed)
HELIUM GLOW power sw - OFF(ctr)
He GLOW COVER - CLOSE - give voice mark - (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) and do not proceed)
X-RAY PURGE - START (mom)
Check BACKUP PURGE tb. If tb is bp perform the following contingency procedure

****
* X-RAY BACKUP PURGE - OFF(mom)(tb-gray) *
* Return to step 5 and repeat once only *
* and do not proceed if X-RAY BACKUP *
* PURGE goes bp again *
****

Wait 15 min.

6.PNL 230
X-RAY HV PWR - 1 (tb-gray, if not, go X-RAY HV PWR - 2, tb should go gray, notify STDN)
Wait 1 min
X-RAY PURGE - CAL (mom-hold for 30 sec)
X-RAY COVER - CLOSE (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr))
Wait 1 min
X-RAY COVER - OPEN (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr))
Wait 2 min
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)

SM EXPERIMENT DEACTIVATION

1. PNL 230
HELIUM GLOW power sw - OFF(ctr)(verify)
EUV TELESCOPE power sw - OFF (verify)
He GLOW COVER - CLOSE (verify)
EUV COVER - CLOSE (verify)
X-RAY COVER - CLOSE (verify)
EXPERIMENT COVERS ARM/SAFE - SAFE
X-RAY HV PWR - off(ctr)(verify)
X-RAY LV PWR - OFF (verify)

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HELIUM GLOW (MA088)

CAUTION

HELIUM GLOW power sw must not be ON when He GLOW COVER is closed

HELIUM GLOW OPERATION

1. Verify Helium Glow Attitude (FP)

2. PNL 230
   - He GLOW COVER - OPEN (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr))
   - Wait 10 sec after tb goes to gray
   - HELIUM GLOW power sw - ON

HELIUM GLOW POWERDOWN

1. PNL 230
   - HELIUM GLOW power sw - OFF(ctr)
   - He GLOW COVER - CLOSE (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr))

HELIUM GLOW He INHIBIT

Perform the following only as advised by STDN

1. PNL 230
   - HELIUM GLOW He INHIBIT - DET 1 or DET 2

DATE

HELIUM GLOW He RESTORE

Perform the following only as advised by STDN

1.PNL 230
HELIUM GLOW power sw - OFF(ctr)(verify)
HELIUM GLOW He INHIB - off(ctr)
He GLOW COVER - OPEN(tb-bp<5 sec then
gray - if not gray in 15 sec off(ctr)
and do not continue)
Wait 10 sec after tb goes to gray
HELIUM GLOW power sw - ON

DATE _____

EUV TELESCOPE (MA083)

CAUTION

EUV TELESCOPE power sw must not be in POWER position with EUV COVER closed

EUV TELESCOPE OPERATION

1. Verify EUV Telescope Attitude (FP)

2. PNL 230
   - EUV COVER - OPEN (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr))
   - Wait 10 sec after tb goes gray
   - EUV TELESCOPE power sw - POWER
   - EUV TELESCOPE detector sw - DET 2 (mom) (DET 1 only if advised by ground)

EUV TELESCOPE POWERDOWN

1. PNL 230
   - EUV TELESCOPE power sw - OFF
   - EUV COVER - CLOSE (tb-bp<5 sec then gray - if not gray in 15 sec off(ctr) - and do not maneuver before contacting STDN)

DATE _____

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DATE

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)

CAUTION

If X-RAY PURGE sw inadvertently placed in START position do not close cover or maneuver.
X-RAY HV PWR - off (ctr)
HELIUM GLOW power sw - OFF (ctr) (verify)
EUV TELESCOPE power sw - OFF (verify)
Wait 3 min, close X-RAY COVER, continue nominal operations except that He Glow and EUV power cannot be turned on for 5 minutes.

DATE

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)

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)

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)

```
**************************************************
* X-RAY CONTINGENCY PREP                         *
*                                                *
* Perform only as advised by STDN                *
*                                                *
* 1. PNL 230                                     *
*       X-RAY HV PWR - off (ctr)(verify)         *
*       X-RAY LV PWR - ON (HV tb-bp)             *
*       X-RAY BACKUP PURGE - OFF (mom)           *
*       Wait 10 min before proceding with        *
*         X-RAY OPERATION                        *
**************************************************
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DOPPLER TRACKING (MA089)

DOPPLER WARMUP (DM Jett -50 hrs)

1. Obtain Doppler Recorder and Cable (A6)

2. Connect cable to recorder and install recorder in F2

3. PNL 230
   DOPPLER RECEIVER - OFF (verify)

4. Route cable through back of F2 and connect to DOPPLER RECEIVER RCDR (panel 230)

5. PNL 274
   cb UV/DOPPLER MNA - close (verify)

6. PNL 230
   DOPPLER RECEIVER - WARMUP

7. PNL DM 815
   cb DOPPLER XMTR DM A - close
   DOPPLER XMTR - WARMUP

DATE _____

DOPPLER RECEIVER OPERATE (DM Jett -4 hrs)

1. PNL 230
   Prepare to give voice mark
   At exactly DOPPLER RECEIVER OPERATE time (FP):
   DOPPLER RECEIVER - OPERATE (one rapid sw motion)(voice mark)

   Log GET ___:__:__

2. Check Doppler Recorder (F2) reels. If they are not rotating record reel index numbers below:

   A____ C____

   B____ D____

3. After 30 min check reels again. If they were not rotating in step 2 the index numbers should have changed. If they are rotating now they should not rotate more than 10 sec. Inform STDN of status.

DATE____

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____

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)

STRATOSPHERIC AEROSOL MEASUREMENT (SAM)(MA7)

SAM INSTALLATION & CALIBRATION

1. PNL 227
   SCI INSTR - OFF

2. Clean window 5 with tissues if soiled

3. Obtain SAM pouch, SAM cable pouch and intervalometer from A6
   Remove dust cap from SAM lens and place in SAM pouch
   Mount SAM in CM5
   Stow pouches in A6
   Connect cables to SAM
   Connect cables to panel 227
   Unfold SAM grid

4. PNL 5
   cb INSTRUMENTS SCI EQUIP HATCH - close
   NONESS BUS - MNA or MNB

5. PNL 227
   SCI INSTR - PWR

6. SAM
   Verify SAM indicator light on
   Give voice mark 'SAM CAL coming up'
   Wait for STDN cue
   SAM calibration sw - CAL (hold 20 sec)

DATE

SAM ALIGNMENT CHECKOUT

1. Verify SAM attitude (FP)

2. Obtain and log below Δ Y, Δ P from SAM reticle:
   Y true = +053.35 + Δ Y
   P true = +025.83 + Δ P

   +053.35 +025.83

   Y true = -------- P true = -------

3. Re-enter N78 (Y true, P true)

4. Recheck and recompute Y, P as necessary for use in SAM operation

DATE _____

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

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

SAM WINDOW 5 PHOTOS

1. Mount SAM in window (if not already done) per SAM INSTALLATION & CALIBRATION (page 1-31)

2. Camera setup:
   HH/NK(B2)/35mm(B2)/CI(B2),FLASH(B5)
   (f11,1/60,focus) 6 FR
   (refer to INTERIOR PHOTOS cue card)

3. Locate camera at least 3 ft from SAM
   Focus
   Photograph SAM from various angles

4. Log Photo Data:
   GET ___:__ MAG ID ____ Frame Count___

SAM SHUTDOWN

1. PNL 227
   SCI INST - OFF

2. Disconnect SAM cables from panel 227

3. Dismount SAM from CM5 and disconnect cables

4. Remove SAM pouch and SAM cable pouch from A6

5. Obtain SAM dust cap from SAM pouch and install on SAM lens

6. Place SAM and cables in pouches and stow in A6

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CRYSTAL GROWTH (MA028)

CRYSTAL GROWTH ACTIVATION

1. Remove temp stowage bag from over U4 locker and open U4 locker door

2. Rotate lock (black) knobs (2) ~ 3/4 turn ccw (as viewed from knob end) to unlock position on each of six chambers (use spanner wrench, located inside locker door, if necessary)

3. Rotate valve (natural metal) knobs (2) ~ 3 turns ccw (as viewed from knob end) to open position (valve plate is aligned with mark on chamber) on each of six chambers

4. Rotate lock (black) knobs (2) ~ 3/4 turn CW (as viewed from knob end) to lock position on each of six chambers

CRYSTAL GROWTH PHOTOS

1. Raise head of couch

2. Obtain Portable Light (A5) and attach to R13

3. Obtain Crystal Growth Framing Device (U1)

DATE

4. Camera setup
   U4/NK(B2)/35mm(B2)/CI(B2),cable release (B2),framing device(U1) (f4,1/8,1 ft) 4 FR (remove lens cap)
   Turn Portable Light - HI and position for best illumination of U4
   Position camera assembly under couch with framing device straddling chambers in pairs (1&2, 2&3, 4&5, 5&6) between knobs and bottom ends of chambers

CAUTION

After positioning camera recheck camera settings before photographing

Log Photo and cabin temp data on next page

DATE

DATE 5/16/75

GET	MAG ID	FR CNT	CABIN TEMP	COMMENTS
---:--	----	---	--.-	--------------------
---:--	----	---	--.-	--------------------
---:--	----	---	--.-	--------------------
---:--	----	---	--.-	--------------------
---:--	----	---	--.-	--------------------
---:--	----	---	--.-	--------------------
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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

DATE

5. Power & Logic Unit sw configuration:
   MODE SELECT - STANDBY
   DARK ADAPT LEVEL sel - 1
   POWER - OFF

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

LIGHT FLASH OPERATION (SUBJECTS)

1. Review light flash forms on next page

2. Ingress couches according to color code when instructed by operator

3. Don masks and take PBs in hand

4. Respond to dark adaptation test instructions/questions from operator

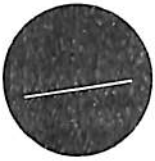
5. Whenever a light flash event occurs depress PB momentarily and describe the event verbally using format from next page. During South Atlantic Anomaly passage, if several events occur at one instant, estimate the number and describe as oriented streaks, disoriented streaks, or snow. If streaks appear to be oriented, describe as predominantly horizontal, vertical, or diagonal. Note whether the multiple events occur in the periphery or in the central field of vision.

6. Doff masks and cease observations when instructed to by operator

LIGHT FLASH FORMS

SHORT STREAK 

 STAR
(Single light point)

LONG STREAK
(Thin line of light) 

 DOUBLE STAR
(Double light points)

HOT DOG
(Wide line of light) 

 TADPOLE
(Tear drop shaped)

DOUBLE STREAK 

 CLOUD
(Diffuse)

SUPERNOVA
(Very bright flash) 

 SNOW
(More than
five short streaks)

Give comments such as 'Dim', 'Bright', 'Very bright'. 'Numerous' or variations.

DATE_____

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 HR MIN	INSTRUCTION
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)

1 + 10 (cont'd)	Log GET ___:__ 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

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.

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.

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

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LEG VOLUME MEASUREMENTS

1. Obtain leg template and tape (A6)
2. Attach template middle velcro in notch below left knee cap
3. Attach template fully extended along leg with other velcro straps
4. Measure all circumferences in cm with tape squarely transverse, same tension
5. Subject records values

	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

DATE _____

LEG VOLUME MEASUREMENTS

1. Obtain leg template and tape (A6)
2. Attach template middle velcro in notch below left knee cap
3. Attach template fully extended along leg with other velcro straps
4. Measure all circumferences in cm with tape squarely transverse, same tension
5. Subject records values

	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

LEG VOLUME MEASUREMENTS

1. Obtain leg template and tape (A6)
2. Attach template middle velcro in notch below left knee cap
3. Attach template fully extended along leg with other velcro straps
4. Measure all circumferences in cm with tape squarely transverse, same tension
5. Subject records values

	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

LEG VOLUME MEASUREMENTS

1. Obtain leg template and tape (A6)
2. Attach template middle velcro in notch below left knee cap
3. Attach template fully extended along leg with other velcro straps
4. Measure all circumferences in cm with tape squarely transverse, same tension
5. Subject records values

	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

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GET	:	:	:	:	:
1					
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12					

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	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

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	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

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3. Attach template fully extended along leg with other velcro straps
4. Measure all circumferences in cm with tape squarely transverse, same tension
5. Subject records values

	MEAS (CM)				
GET	:	:	:	:	:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

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

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)

DATE

CM MEASUREMENTS

AC:

GET		
SEATED HT		
REL EYE HT		

CP

GET		
SEATED HT		
REL EYE HT		

DP

GET		
SEATED HT		
REL EYE HT		

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.

DM MEASUREMENTS

AC:

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

DM MEASUREMENTS

CP:

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

DM MEASUREMENTS

DP:

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

GET		
ERECT HT		
REL EYE HT		

DATE ~~6/23/75~~ 7/2/75 (P:1)

FISH EXPERIMENT (MA161)

1. DAC SETUP Use C129 (A6) for day 2 only
   HH/DAC/10mm(F1.8,1/125,9'')12fps
   PORTABLE 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
   PORTABLE LIGHT - HI
   Photo for 15 sec each compartment of fish
   Observe fish and log comments

DATE

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
   PORTABLE LIGHT - HI

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

1-66A DATE 6/23/75

ORIENTATION OF FISH (ESTIMATE NUMBERS)

	DAY 2					DAY 6				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
MORTALITY										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
BELLY TO CARD										
BELLY AWAY										
BELLY RANDOM										

	DAY 7					DAY 8				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
MORTALITY										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
BELLY TO CARD										
BELLY AWAY										
BELLY RANDOM										

ORIENTATION OF FISH (ESTIMATE NUMBERS)

	DAY 9					DAY __				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
MORTALITY										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
BELLY TO CARD										
BELLY AWAY										
BELLY RANDOM										

	DAY __					DAY __				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
MORTALITY										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
BELLY TO CARD										
BELLY AWAY										
BELLY RANDOM										

DATE 6/23/75

HATCHING ACTIVITY OF EGGS (ESTIMATE %)

	DAY 6					DAY 7				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
HATCHED										
UNHATCHED										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
MORTALITY										

	DAY 8					DAY 9				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
HATCHED										
UNHATCHED										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
MORTALITY										

DATE 6/23/75

HATCHING ACTIVITY OF EGGS (ESTIMATE %)

	DAY __					DAY __				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
HATCHED										
UNHATCHED										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
MORTALITY										

	DAY __					DAY __				
COMPARTMENT	1	2	3	4	5	1	2	3	4	5
HATCHED										
UNHATCHED										
LOOPING SPONTANEOUSLY										
LOOPING AFTER DISTURBANCE										
MORTALITY										

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

DATE

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

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

DATE

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

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

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

DATE

10. Remove tube 3 from bag and attach ampule 9 to any syringe
    DAC - ON(remote)
    Inject contents of syringe into tube 3

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

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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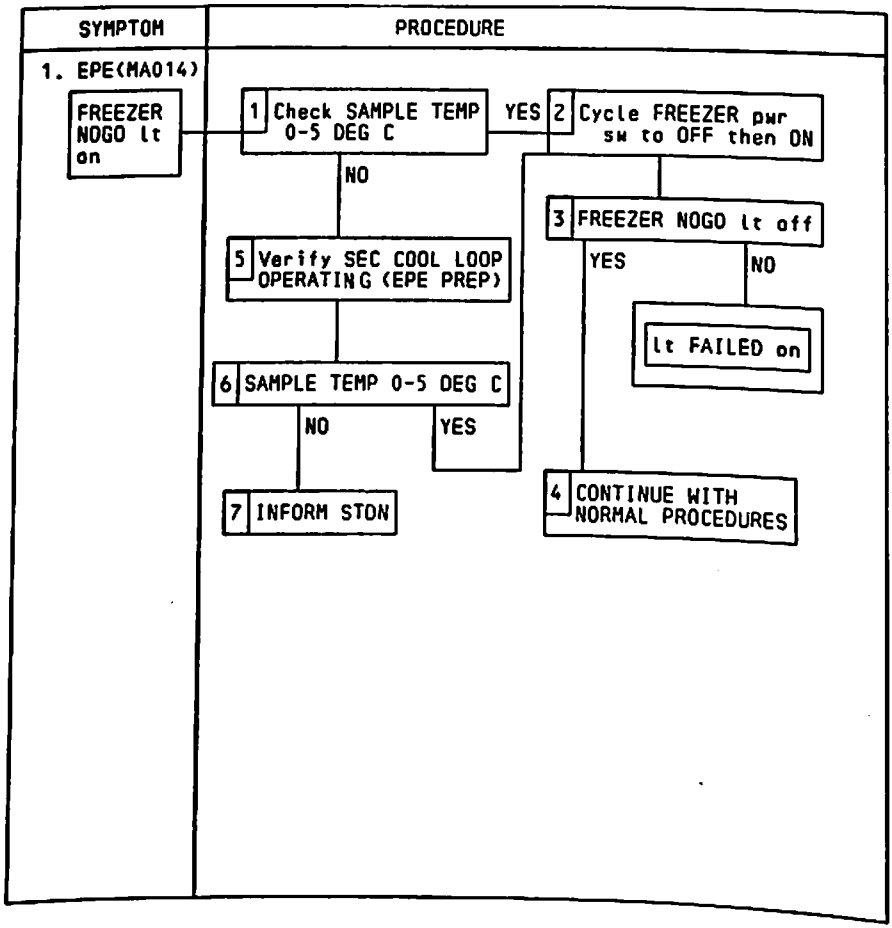
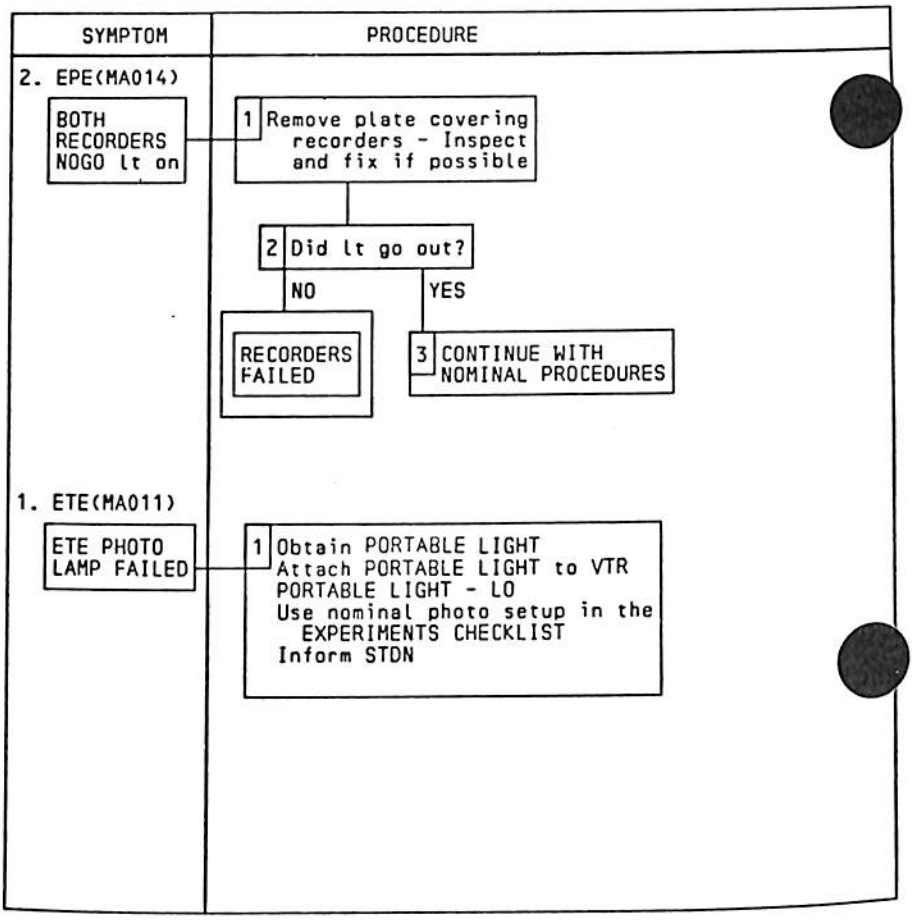
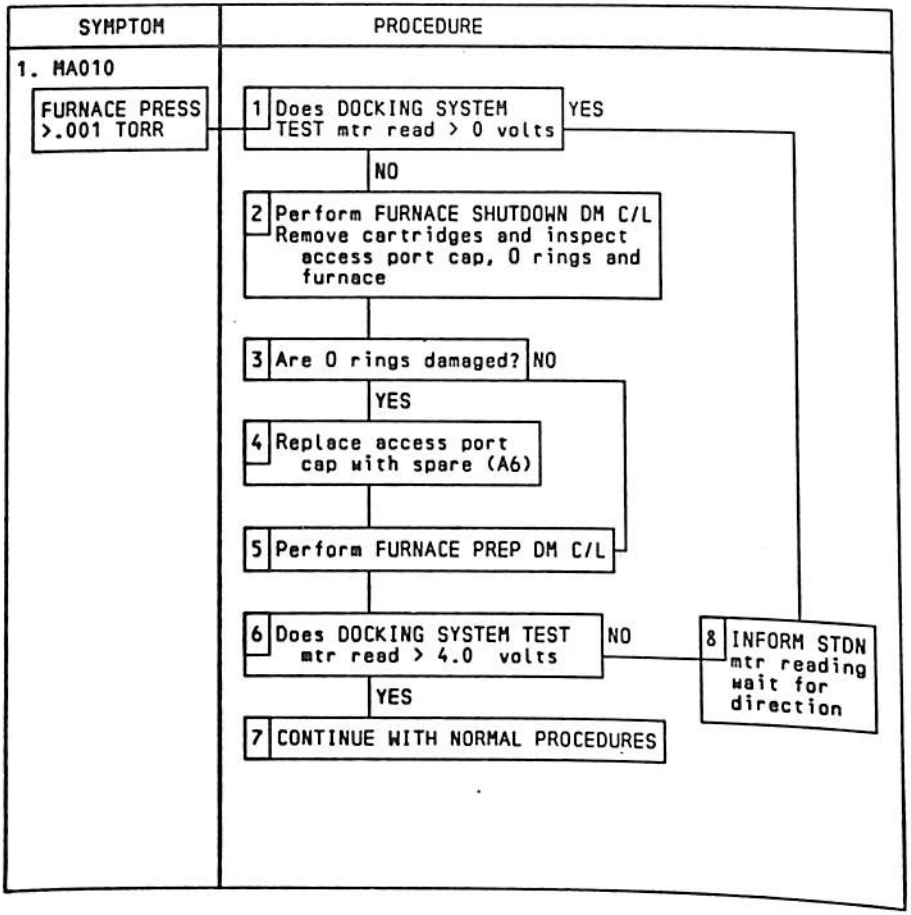

SYMPTOM
PROCEDURE
1. EPE(MA014)
FREEZER NOGO lt on
1 Check SAMPLE TEMP 0-5 DEG C
YES
2 Cycle FREEZER pwr sw to OFF then ON
NO
3 FREEZER NOGO lt off
YES
NO
lt FAILED on
5 Verify SEC COOL LOOP OPERATING (EPE PREP)
6 SAMPLE TEMP 0-5 DEG C
NO
YES
7 INFORM STON
4 CONTINUE WITH NORMAL PROCEDURES

DATE


SYMPTOM
PROCEDURE
2. EPE(MA014)
BOTH RECORDERS NOGO lt on
1 Remove plate covering recorders - Inspect and fix if possible
2 Did lt go out?
NO
YES
RECORDERS FAILED
3 CONTINUE WITH NOMINAL PROCEDURES
1. ETE(MA011)
ETE PHOTO LAMP FAILED
1 Obtain PORTABLE LIGHT
Attach PORTABLE LIGHT to VTR
PORTABLE LIGHT - LO
Use nominal photo setup in the EXPERIMENTS CHECKLIST
Inform STDN


SYMPTOM
PROCEDURE
1. MA010
FURNACE PRESS >.001 TORR
1 Does DOCKING SYSTEM TEST mtr read > 0 volts
YES
NO
2 Perform FURNACE SHUTDOWN DM C/L Remove cartridges and inspect access port cap, O rings and furnace
3 Are O rings damaged?
NO
YES
4 Replace access port cap with spare (A6)
5 Perform FURNACE PREP DM C/L
6 Does DOCKING SYSTEM TEST mtr read > 4.0 volts
NO
8 INFORM STDN mtr reading wait for direction
YES
7 CONTINUE WITH NORMAL PROCEDURES

DATE

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STRATOSPHERIC AEROSOL MEASUREMENT (SAM) (MA7)

PI: DR. THEODORE J. PEPIN
UNIVERSITY OF WYOMING

OBJECTIVES

The objective is to demonstrate the feasibility of measuring the concentration and vertical distribution of aerosols in the stratosphere by remote sensing from a low orbiting manned spacecraft.

CONCEPT

The instrument package consists of a photometer and an electronics package to provide a signal to the TLM system. The experiment technique involves measuring solar intensity in the near infrared region as the sun rises or sets through the stratosphere at spacecraft sunrise or sunset. Truth data will be gathered during the time of the spacecraft measurements from high altitude balloons.

BENEFITS

The lack of knowledge concerning the effects of large amounts of water vapor in the stratosphere became apparent during the SST controversy and resulted in an increased interest in the subject. The remote sensing technique is in an early stage of development and the information provided by this experiment will greatly aid in rapid development in this important field.

DATE

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MULTIPURPOSE FURNACE (MA010)

PI: Dr. R. Reed, Oakridge Nat Lab (MA041)
Dr. C. Ang, Northrup (MA044)
Dr. H.C. Gatos, MIT (MA060)
Dr. D.J. Larsen, Grumman (MA070)
Dr. H. Wiedemeir, RPI (MA085)
Dr. A.S. Yue, UCLA (MA131)
Dr. I. Ivanov, USSR (MA150)

OBJECTIVES

(MA041) Surface Tension Induced Convection. This experiment will consist of melting three samples of bi-metallic material samples (Pb/Pb with .05 atomic percent AU) in wetting (iron) and non-wetting (graphite) capsules in the furnace, allowing them to interdiffuse, and then solidify.

(MA044) Monotectic and Syntecic Alloys. In this experiment, two samples of Al-Sb will be prepared and vacuum encapsulated in quartz. These samples will be melted and then solidified.

(MA060) Interface Working in Crystals. In this experiment, single crystals of germanium (Ga doped) will be subjected to partial melting and regrowth in the furnace. Throughout the growth process, ''interface demarcation'' will be achieved by Peltier heating associated with the transmission of electric current pulses across the crystal-melt interface.

(MA070) Zero-G Processing of Magnets.
In this experiment, in the hot constant temperature zone, the immiscible system Mn-rich MnBi will be solidified. Using the temperature gradient zone of the furnace, the cobalt/rare Earth alloy CoCuFe5Ce will be directionally solidified to produce an almost perfect magnetic crystal.

(MA085) Crystal Growth From The Vapor Phase.
Single crystal growth by chemical vapor transport in a temperature gradient is macroscopically and microscopically affected by gravity induced convection currents. This experiment will investigate GeSe-GeTe alloys under zero-g conditions and study the effects of convection current.

(MA131) NaCl-LiF Eutectic.
In this experiment a eutectic liquid of NaCl and LiF will be solidified and fibers of LiF will be formed in a matrix of NaCl. This material is of interest for optics because of the ability of the fibers to transmit light and information from one end of the fiber to the other.

(MA150) USSR Multiple Material Melting.
This experiment will process three different material systems in each cartridge. In the hot isothermal region a sample of aluminum with tungsten spheres will be partially melted and resolidified. A germanium rod with .5% silicon will be partially melted and resolidified in the gradient region. An additional isothermal

region will be created in the gradient zone to process an ampoule of powered aluminum.

CONCEPT

The MA-010 Multipurpose Furnace Experiment utilizes a furnace system comprised of three units: the multipurpose furnace, the control package, and a rapid cooldown system. The furnace provides three experiment chambers which have a hot zone, thermal gradient section and a heat extraction section. The control package regulates the temperature of the hot zone, permits slection of the amount of soak time desired, cools the furnace at a predetermined rate, and shuts down the system. The rapid cooldown system supplies gaseous helium to reduce the time required to cool the cartridges to a temperature such that they can be safely touched.

BENEFITS

These experiments are designed to yield information useful for planning future material investigation and metallurgical manufacturing in space. The development of a fundamental understanding of the effects decribed will make important contributions to material science.

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ELECTROPHORESIS TECHNOLOGY (MA011)

PI: Dr. R.S. Synder, NASA, MSFC
Dr. R.E. Allen, NASA, MSFC

OBJECTIVES

The objective is to test new techniques for performing electrophoretic separations in space flight. Specifically, the problems to be investigated are: to test sample insertion techniques, to verify that electrosmosis can be eliminated in a static fluid electrophoresis device, to evaluate the performance of two methods of electrophoresis, and to verify that the viability of biological samples prepared for electrophoresis can be maintained during a space mission.

CONCEPT

Electrophoresis, i.e., the separation of biological materials such as cells by means of an electric field, is an important tool in biological and medical research. Most of the development in the field has been in an area described as zone electrophoresis in stabilized media. This technique separates a single narrow zone of sample mixture in an electrolyte medium into many zones containing a single component of the mixture and electrolyte between them. Since the densities of the separated zones generally differ from that of the intervening medium, such systems are gravitationally unstable and stabilization is required.

Electrophoresis was orginally carried out in liquid media, or free solutions, but it was realized that problems arise due to disturbances in the bulk of the fluid. Two major causes of these disturbances during one-g processing are the density of the particles or solute being separated and the thermal convection generated by the Joule heating of the column during electrophoresis. Although a variety of techniques have evolved to overcome these problems on Earth, none have been completely successful and the elimination of gravity-induced sedimentation and thermal convection can be accomplished best in space. The ASTP mission provides an opportunity to test techniques in a low gravity field with a potential improvement in the degree of separation.

BENEFITS

Experiment MA011 will be a further development of technology begun in the Apollo 14 and 16 missions. The use of pre-frozen samples will avoid floculation and sedimentation of the sample, and will preserve viability of the biological samples. Electro-osmotic action will be reduced by use of chemical compounds designed to neutralize the charge on the walls of the electrophoresis columns.

ELECTROPHORESIS - GERMAN (MA014)

PI: Dr. Kurt Hanning, GFW

OBJECTIVE

The objectives of MA014 are to verify particle electrophoresis in the absence of gravity, test the quality of separation at high sample flow rates and to demonstrate the possibility of separation cells for clinical applications.

CONCEPT

In the experiment the separation is accomplished by mixing the sample with a buffer which flows slowly and in a laminar manner along a channel perpendicular to the electric field. The sample is introduced continuously through a small hole on the upstream side of the channel and is separated in various angles according to buffer velocity, the electric field gradient, and the various mobilities which are typical for the components of the mixture. Each sample will be subjected to three combinations of buffer velocity and field gradient. At the downstream end, the deflection and density distribution will be analyzed by opto-electronic means and the results stored in digital form on the Experiment MA-014 tape recorder which will be returned to Earth in the CM.

At present the efficiency of free-flow electrophoresis is limited by the resolution of the electrophoresis apparatus and the low output of separated cells. Higher

output could be achieved by using higher flow rate, wider separation gap, and higher electric field densities. This, however, increases the temperature with resultant increase in convection currents and sedimentation. In zero gravity, these conditions would not prevail.

BENEFITS

Free flow electrophoresis, in which the sample flows continuously through an electric field perpendicular to the flow, has become important in human medicine. Patients suffering from bone marrow disease could be treated by ablation of the diseased bone marrow and replacement with the marrow of a healthy donor. However, transplantation disease usually results. It is widely anticipated that this disease could be avoided by separating the bone marrow component that protects the patient from the immuno-reactive component which attacks the patient. Laboratory tests have indicated the capability of free-flow electrophoresis in this type of separation.

CRYSTAL GROWTH (MA028)

PI: DR. M. D. LIND
SCIENCE CENTER-ROCKWELL INTERNATIONAL

OBJECTIVES

The objectives are to determine if single crystals of insoluble compounds can be grown in zero gravity conditions by allowing reactant solutions to diffuse toward each other through a pure water region, to obtain single crystals superior to those heretofore available for research and commercial applications, and to obtain data for evaluating this and other zero gravity techniques for growing crystals.

CONCEPT

The experiment hardware consists of six transparent reactors consisting of three compartments each. The two outer compartments will each contain a different salt solution, which, when mixed, will form an insoluble compound. The center compartment will contain pure water and possibily a small seed crystal of the insoluble compound. The experiment will be initiated by opening valves which will allow the salt solutions to mix in the center compartments of each chamber. The insoluble crystals will then form in the pure water. The progress of the crystal growths will be recorded by photography and the final products will be returned for examination.

BENEFITS

High temperature melt, solution, or vapor growth methods are complicated by a number of undesirable effects, including phase transformations, volatility of one or more of the components and thermally and mechanically induced strain. Gel methods are complicated by contamination and mechanical constraint. The zero gravity method is a low temperature method which minimizes problems of phase transformations, volatility, strain, mechanical constraint and contamination which are inherent in other methods.

X-RAY OBSERVATIONS (MA048)

PI: DR. SETH SHULMAN
NAVAL RESEARCH LABORATORY

OBJECTIVES

The objectives are to observe and map celestial and earth atmospheric soft X-ray emissions. Specifically the objectives are to map celestial emission in the energy region of 0.1 to 1.0 Kev, to obtain spectral and timing data in the range of 0.1 to 10.0 Kev, and to obtain data on the spatial dependence and time variability of atmospheric X-ray emission in the range of 0.1 to 10.0 Kev.

CONCEPT

Observations to date have revealed a diffuse glow of X-rays in all directions with maximum flux in the direction of our galactic poles. X-ray sources have also been observed which only emit at energies below 2 Kev. The relatively long observing times available on this mission make it possible to use a narrow field-of-view instrument with improved angular resolution and better sensitivity for detecting low contrast features.

BENEFITS

The unique features which will be used for the first time on an orbiting vehicle include low energy capability and electronics to fully utilize the spectral resolution of the proportional counter and fast timing capability. This mission is also occurring at a unique juncture in the development of X-ray astronomy. The UHURU satellite has located about 160 sources. These results point to further observations requiring the capabilities planned for this experiment.

UV ABSORPITION (MA059)

PI: Dr. Thomas Donahue, U of MICHIGAN

OBJECTIVES

The objective of MA059 is to measure the densities of atomic oxygen and atomic nitrogen in Earth's atmosphere at the orbital altitude by optical absorption spectroscopy, and determine the atmospheric gas temperature.

CONCEPT

The ASTP mission presents a unique opportunity to apply optical absorption spectroscopy to the investigation of neutral atomic oxygen and nitrogen abundances and their temperatures in the Earth's upper atmosphere. Also, abundances in the ambient atmosphere associated with the Apollo and Soyuz spacecraft can be obtained. The technique will be to send monochromatic light beams whose wavelengths correspond to neutral atomic oxygen and nitrogen resonance lines (1304 Angstrom and 1200 Angstrom, respectively) from the CSM to the Soyuz, where they will be retroreflected into a scanning grating Ebert-Fastie spectrometer on the CSM. The major doppler effects will be avoided by positioning the two spacecraft so the beam travels perpendicularly to the ''relative wind.'' The line profiles are obtained by reintroducting minor doppler effects via spacecraft maneuvering.

For the Earth-atmosphere investigations, the effects of the out gas contaminents surrounding the spacecraft will be accounted for by varing the spacecraft separations and studying the near field resonant scattering signal.

BENEFITS

At present, the abundances of atomic oxygen and atomic nitrogen in the Earth's upper atmosphere are not known. MA059 experiment will attempt to measure these abundances. The mass spectroscopy technique of this experiment contains inherent sources of ambiguity and the PI feels that it is possible to calibrate out these effects. The MA059 experiment will attempt to demonsttrate that the mass spectroscopy technique is valid to measure the constituent abundances of the atmosphere.

EXTREME UV (EUV) TELESCOPE (MA083)

PI: DR. C. STUART BOWYER
UNIVERSITY OF CALIFORNIA

OBJECTIVES

The objective is to search for radiation sources of EUV in the region between 50 and 1000 Angstrom. Specific objectives are: to observe EUV discrete sources (coronas of nearby stars, defunct pulsars, accreting matter stars) and the time variations associated with EUV sources; make spectral studies of discrete and extended sources with the objective of determining the emission mechanism.

CONCEPT

The EUV portion of the high energy spectrum has been neglected by astronomers because an early interpretation of the complex nature of the interstellar gas led to the false conclusion that absorbtion by neutral hydrogen would preclude EUV light from traveling sufficiently far through interstellar space to be of much use to astronomy. More recent data indicate that the interstellar gas is sufficiently inhomogenous to permit EUV observations of sources up to several hundred parsecs away, in at least some directions-and within such distances there are several million stars.

BENEFITS

This mission provides an outstanding opportunity for a ground-breaking survey of a totally new field.

HELIUM GLOW (MA088)

PI: DR. C. STUART BOWYER
UNIVERSITY OF CALIFORNIA

OBJECTIVES

The objective is to measure the intensity and spatial distribution of the interplanetary helium and in-flow velocity of the interstellar medium within the solar system. Specific objectives are to measure helium line radiations (304 Angstrom and 584 Angstrom) over as much of the sky as possible, inspect those regions where the helium spectral lines are predicted to be strongest, and obtain information about the shape of the spectral lines and the motion of their sources by means of the Doppler shift caused by the spacecraft's orbital velocity.

CONCEPT

Data will be collected from random scans and from preplanned quick roll scans. The interstellar gas is the medium from which celestial objects form and into which many of them dissipate their constituent elements when their lives are ended. It is also the medium through which the radiations, whereby we study these objects, must travel. Clearly, a detailed knowledge of the structure and properties of the interstellar gas is of vital importance to astronomers.

BENEFITS

The spacecraft's maneuvering and pointing capabilities allow the experiment to collect a large amount of data from widely separated parts of the sky in a short time. Such rapid data collection is important both because the changing position of the earth in its orbit changes the observed pattern of scattered radiation and thereby complicates data reduction and because the experiment requires a consumable, i.e., helium for gas filters. The ASTP launch opportunity allows a quick return of data which could not be realized if the experiment were in the more common situation of waiting for a spacecraft paced by long development items.

DOPPLER TRACKING (MA089)

PI: GEORGE C. WEIFFENBACH
SMITHSONIAN ASTROPHYSICAL OBSERVATORY

OBJECTIVES

The primary objective is to map earth gravity field anomalies of magnitude 10(-5) g and larger. The secondary objective is to investigate the feasibility of constructing vertical ionospheric profiles by inversion of spacecraft-to-spacecraft two-frequency radio refractivity data.

CONCEPT

In recent years great interest has focused on consideration of mass density anomalies in the earth's asthenoshpere with scale sizes of 100 to 700 km. Large scale anomalies with sizes greater than approximately 3000 km have been investigated during the past two decades by studies of gravitationally induced perturbations of orbits of artificial satellites. This technique is applicable only to larger scale anomalies primarily because the perturbations must be integrated over sizeable portions of the orbits. Thus a new technique is required to measure gravitational anomalies in the range of interest, 100 to 700 km. An experimental technique which is expected to be sensitive to gravitational anomalies with scale sizes of 100 to 700 km is Doppler measurement of gravitationally induced small accelerations between two suitably separated artificial satellites,

such as the CM and DM after jettison, traveling in the same or nearly same orbits.

BENEFITS

Study of anomalies in the 100 to 700 km range is expected to contribute greatly to the knowledge of the physics of the mantle and of plate-tectonics, which in turn is expected to be helpful in reconstructing important aspects of the earth's evolution such as continental drift. The refraction effects can be measured by employing two-frequency transmission and their investigation will provide bottomside ionosphere mapping on a global scale.

LIGHT FLASH (MA106)

PI: DR. THOMAS F. BUDINGER
UNIVERSITY OF CALIFORNIA

OBJECTIVES

The objective is to observe quantitatively the character and frequency of visible phenomena caused by the passage of ionizing particles through the visual apparatus of human observers in earth orbit.

CONCEPT

Flux measurements will be made during two orbits, each of which passes first near the north geomagnetic pole and then through the South Atlantic Anomaly. One pass will be made with the crew visually observing for light flashes and one without visual observations. During both passes silicon detectors with associated electronics and tape recorder will record particle events and their energies. The same recorder will be used during the manned pass to record events observed by the crew. Also during each pass, silver chloride crystals will record the path and energy of particle events.

BENEFITS

That ionizing particles offer a potential hazard for long term space flight is emphasized by the realization that on a three-year mission, it is estimated that between two percent and ten percent of the body will be struck by atomic nuclei of

carbon, nitrogen, oxygen and heavier elements. These measurements and observations will add to the knowledge necessary to determine radiation protection on long-term orbital and interplanetary missions.

BIOSTACK (MA107)

PI: DR. HORST BUECKER
UNIVERSITY OF FRANKFURT

OBJECTIVES

The objective is to investigate the biological effects of individual heavy ions of cosmic radiation on selected biological materials.

CONCEPT

This experiment will provide data on the biological effects of individual heavy nuclei of cosmic radiation during space flight. These effects will be determined by flying biological materials interleaved with dosimeters in one unit (passive). In addition, a second unit (which is activated by the crew turning on a self contained yellow light source) contains silver chloride dosimeter material. The active silver chloride unit will be activated for a specified time.

BENEFITS

The results of this experiment will contribute to the solution of several problems in basic research, namely: the biological effects produced by high energy heavy ions and very heavy ions, which are not obtainable from sources on earth; the combined and relative influence of heavy ions and background radiation by evaluating hit and unhit regions of the biostack; the validity of the existing

theories of microdensitometry by relating local doses due to the different individual heavy ions to the biological lesion; the combined influence of heavy ions and space flight factors, especially weightlessness, by comparing the results of a space flight experiment with those of balloon-borne experiments and of experiments using accelerators.

GEODYNAMICS (MA128)

PI: DR. FRIEDERICH O. VONBUN
GODDARD SPACE FLIGHT CENTER

OBJECTIVES

The objective is to demonstrate the feasibility of recovering high frequency components of the geopotential by use of a synchronous relay satellite tracking a low altitude spacecraft.

CONCEPT

Recent developments in the plate-tectonics hypothesis of the earth's structure has placed added emphasis on the need for information concerning the internal distribution of mass in the earth. The structure of the earth's gravity field provides one of the few clues to this mass distribution. This experiment will provide measurements of intermediate wavelength (200-300 km) features in the gravity field which are fundamental to advancing our understanding of plate-tectonics. This experiment will provide data on the earth's gravity field by detecting gravity induced accelerations as evidenced by Doppler frequency shifts derived from the coherent radio carrier during the ATS-F/Apollo relay mode.

BENEFITS

The results of this experiment will complement those of the ASTP experiment MA089, Doppler Tracking, where sensitivity to detect gravity anomalies is expected to be in the 200 to 500 km range.

ZONE FORMING FUNGI (MA147) (AS-1)

PI: Dr. G.R. Taylor, NASA, JSC

OBJECTIVES

The objective is to study the effect of the complex space flight factors on the synchronized zone-forming rythms of fungus cultures.

CONCEPT

The Puschino strain of Actinomyces levoris Kzas is used as the object of this study. By using the correct nutritional medium and the proper period of light-dark conditions, any desired zone forming rhythm may be imposed. The zone-forming rhythms will be synchronized with the circadian rhythms in the USSR and USA (with a half-phase shift). These cultures will be placed in the Apollo and Soyuz spacecraft where they will remain during the flight. Photographs will be taken periodically, and one container from each of the spacecraft will be exchanged during the docked portion of the flight.

BENEFITS

Add to NASA's information on the space flight effects on circadian rhythm. Also information will be gathered to determine the effect of local radiation factor on zone forming rhythm, growth assymetry and regions of the zone breaks.

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ARTIFICAL SOLAR ECLIPSE (MA148)

PI: Dr. G.M. Nikolsky, USSR

OBJECTIVES

The purpose is to observe the 1975 solar corona and the spacecraft induced environment around the Apollo spacecraft in order to determine the coronal structure for distances as great as possible from the solar disk. An attempt will be made to correlate the coronal results with the disk activity observed simultaneously with ground-based observations.

CONCEPT

The Apollo-Soyuz flight provides an opportunity to observe the solar corona in the 1975 time frame and the spacecraft induced environment around the Apollo Spacecraft. The use of the Apollo Spacecraft to provide occultation of the sun for the Soyuz spacecraft (providing an artificial solar eclipse) will provide an opportunity to photograph the coronal structure, possibly to substantial angular distances from the solar disk.

In addition to registering the general pattern and obtaining photometric characteristics of the outer corona of the sun, data can be obtained pertaining to the environment around the spacecraft arising from outgassing of sealed compartments, degassing and sublimation of outer structure materials, and attitude control thruster burns.

BENEFITS

The MA148 experiment will add to the USSR knowledge of the solar corona in the 1975 time frame.

MICROBIAL EXCHANGE (AR002) (AS-2)

PI: Dr. G.R. Taylor, NASA, JSC

OBJECTIVES

The objectives are to qualitatively and quantitatively measure the microbial load of the Apollo and Soyuz crew members and of both spacecraft, in order to determine spaceflight mediated alterations and the degree of microbial exchange among crew members.

CONCEPT

Significant postflight microbial alterations have been observed in samples obtained from astronauts and command modules after previous missions. Supporting ground studies indicate that such alterations may result in potentially harmful microbial imbalances. This experiment should provide a thorough evaluation of such alterations before, during, and after the flight. The use of two crews and two spacecraft allows for quantitative comparisons and identification of microbial exchange. Microbial samples will be collected from all five crew members and from both spacecraft during the flight. The swabs used for collection of the microbial samples will be launched and stored in the Soyuz in four containers. Two containers with swabs will be transferred to the CSM for inflight sampling in the CSM and will be returned to the Soyuz for return to

Earth. The other two containers with swabs will be used for inflight sampling in the Soyuz.

BENEFITS

The AR002 experiment will add to NASA's knowledge of the fundamental effects of spaceflight on man. The information to be gained will be used to make space travel as safe as possible for man.

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

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 curently 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

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.

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.

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 deveopment 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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EXPERIMENT OPERATIONAL CONSTRAINTS

STRATOSPHERIC AEROSOL MEASUREMENTS (SAM) (MA7)

Attitude rates must be less then 0.03 deg sec. SAM attitude must initially point SAM within 0.5 deg of the center of the sun.

MULTIPURPOSE FURNACE (MA010)

Single jet attitude control is required. Two jet control in roll is acceptable only during the docked period.
No RCS burns are to be performed during the solidification phase of the experiment.
Scheduling the control cooldown period during sleep periods is desirable.
MA041 sample is to be performed first and MA044 last in the flight plan. The order of the other experiments is not specified.

ELECTROPHORESIS TECHNOLOGY (MA011)

Single jet attitude control is required.
No RCS burns are to be performed during the experiment operation.

DATE

ELECTROPHORESIS - GERMAN (MA014)

The experiment must be started within 130 hours from launch stowage.
Once started, the experiment must be completed within 2 hours.
Single jet attitude control is required.
No RCS burns are allowed during the experiment.

CRYSTAL GROWTH (MA028)

This experiment Must not be activated until the bulk of the maneuvers associated with the joint phase have been completed.

X-RAY OBSERVATIONS (MA048)

The experiment centerline must not be pointed within 45 degrees of the sun in daylight with the cover open.

The experiment centerline must not be pointed within the band from 45 to 65 degrees of the sun in daylight for more than 5 minutes with the cover open.

Note: to implement the above the cover must be closed during daylight except when specified in the Flight Plan.

The following constraints will be taken care of by proper flight planning since they cannot generally be effectively met by onboard planning.

SPS operation and RCS thrusters A2, A4, B1 and B4 will be inhibited when the experiment cover is open.

The experiment cover must be closed before effluent dumps and for fifteen minutes after.

Data will not be collected while in the SAA.

The experiment must be pointed within two degrees of the prescribed pointing direction for taking data.

Observations must be performed only when targets are viewable with local zenith angles of less than 90 degrees.

UV ABSORPTION (MA059)

The experiment centerline must not be pointed within 20 degrees of the sun or 10 degrees of the moon with the experiment cover open.
UV ABSORPTION LAMPS warmup time is 30 min.
UV ABSORPTION POWER must be OFF when door is being opened or closed.
The experiment cover must be closed before all effluent dumps and 15 min after.
SPS operation and RCS thrusters B3,C4,D4 will be inhibited for all data takes.

EXTREME UV (EUV) TELESCOPE (MA083)

The experiment must never be powered up with the cover closed nor for 10 seconds after the cover has been opened.

The experiment centerline must not be pointed within 10 degrees of the sun with the cover open.

The following constraints will be taken care of by proper Flight planning since they cannot generally be effectively met by onboard planning.

The instrument must be pointed within one degree of the specified target.

The experiment cover must be closed before effluent dumps and for fifteen minutes after. This constraint does not apply to venting of the Multipurpose Furnace. In addition, the cover must be closed before X-Ray experiment purges and for five minutes after.

SPS operation and RCS thrusters A2, A4, B1, and B4 must be inhibited when the experiment cover is open.

Observations must be performed only when targets are viewable with local zenith angles of less than 70 degrees.

HELIUM GLOW (MA088)

The experiment must never be powered up with the cover closed nor for 10 seconds after the cover has been opened.

The following constraints will be taken care of by proper flight planning since they cannot generally be effectively met by onboard planning.

The instrument pointing vector must be known to within 2 degrees.

SPS operation and RCS thrusters A2, A4, B1 and B4 must be inhibited whenever the experiment cover is open.

The experiment cover must be closed before effluent dumps and for 15 minutes thereafter. This constraint is not applicable to venting of the Multipurpose Furnace. In addition, the cover must be closed before X-Ray experiment purges and for 5 minutes thereafter.

Observations must be performed only when targets are viewable with local zenith angles of less than 70 degrees.

DOPPLER TRACKING (MA089)

The following constraints will be taken care of by proper flight planning since they cannot generally be effectively met by onboard planning.

The experiment transmitter and receiver must be switched to WARMUP at least 50 hours prior to DM Jettison. The experiment receiver must be switched to OPERATE at least 4 hours prior to DM Jettison. The transmitter must be switched to OPERATE at least 1 hour prior to DM Jettison.

LIGHT FLASH (MA106)

LVLH attitude is constrained to R 146,P 115, Y 346.

Orbits are constrained to those that descend through the near-center of the South Atlantic Anomally.

Window shades must be installed and interior lighting must be dimmed as low as possible to minimize the effects of light leakage into the masks, but high enough to permit one crewman to operate the experiment controls for the manned portion of the LIGHT FLASH OPERATION.

Dark adaptation and testing begins 20 minutes prior to passage of the northernmost point in the orbit. However, if light flash events are observed during this 20 minutes they are to be recorded by voice and the Event PB's.

Data collection and primary observations should begin precisely at passage of the northernmost point of the orbit and end 90 minutes later.

BIOSTACK (MA107)

The Active Biostack will be activated only when docked with DM but not with the SOYUZ. It will be activated for a minimum of 12 hours prior to docking with the Soyuz and for approximately 24 hours after undocking from the Soyuz.

GEODYNAMICS (MA128)

All dumps and venting operations must be inhibited during experiment data collection periods in order to avoid non-gravitational accelerations.

ZONE FORMING FUNGI (ZFF) (MA147) (AS-1)

Photographs must be taken every 12 +/- 3 hours of the mission.

MICROBIAL EXCHANGE (AR002) (AS-2)

Samples are to be collected as late as practical during the last joint activity period.
All samples are to be returned in the SOYUZ to minimize the time from sample collection to analysis.
Each crewman will take his own samples.

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

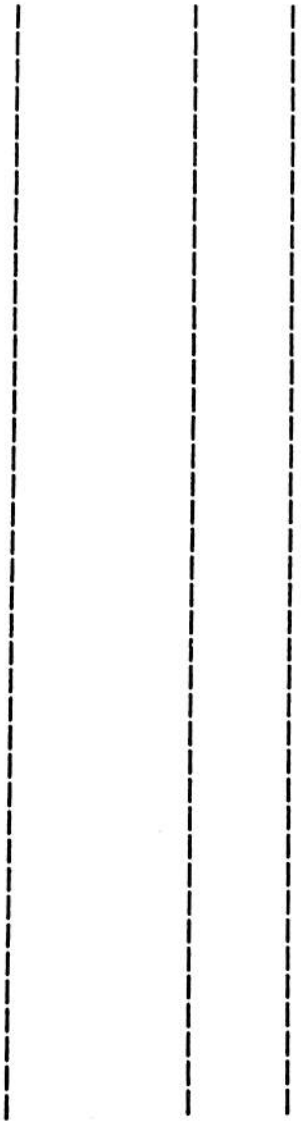
Log photos taken (Required every 12 +/- 3 hours)

GET	FILM MAG	FR #	DEVICE S/N

DATE 6/25/75

J
10-2

GET FILM MAG FR # DEVICE S/N



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

DATE 6/25/75

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 QD and URINE OVBD QD 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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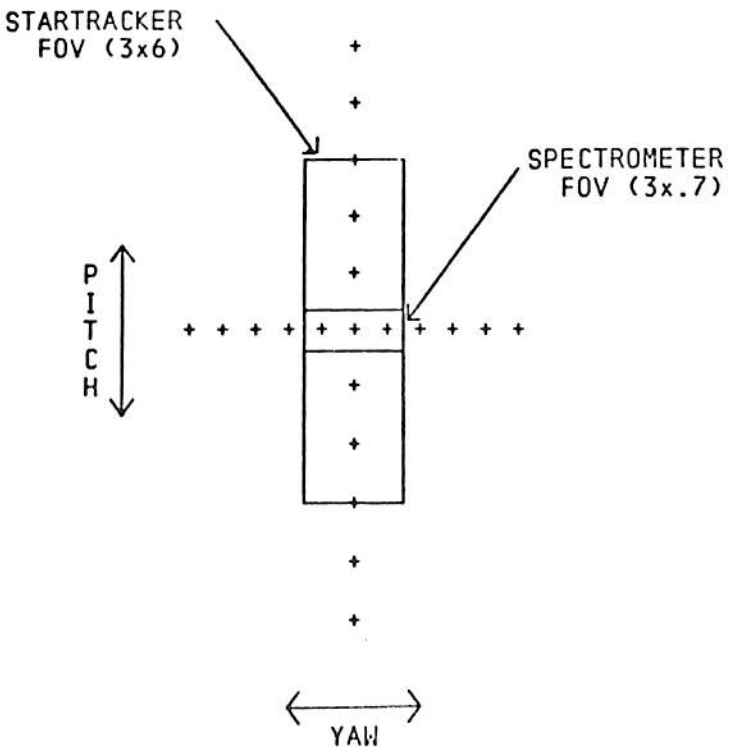
UVA SHUTDOWN

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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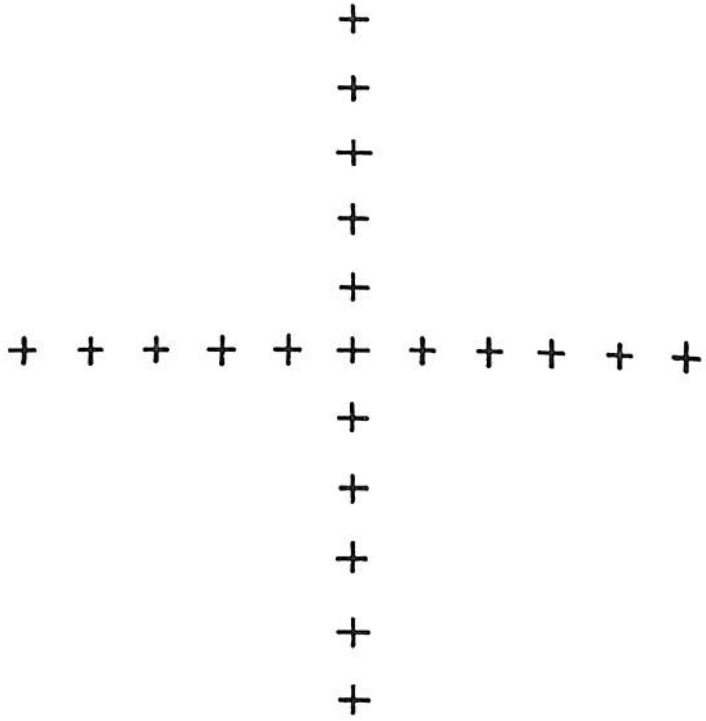
DATE 7/1/75



COAS RETICLE

DATE 6-23-75

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DATE 6-23-75

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.

DATE 7/1/75