

EQUIPMENT PREP

Empty UCTA's (HTR)  
 Check PGA Zippers, Verify Lock-Lock  
 PGA Relief Valve Cap In Pkt  
 Empty PGA Pkts In Purse  
 Verify Watch On PGA

Stow Armrests  
 Stow COAS In Fwd Window Mount  
 Stow LEVA Bags On Floor, 1 Left, 1 Right

Unstow PLSS On Floor, Set Against Hatch  
 Install Helmet Bag  
 Stow Sleep Restraints Under CDR'S PLSS  
 Attach LMP's PLSS Strap (Bot ISA PKT)

Secure ISA Over RCU Shelf  
 Transfer Ancillary Stowage Container  
 (Aft LHSSC) To Jett Bag Compt Aft OPS  
 Stow 3 Jett Bags (4-Aft OPS) In LHSSC  
 Hang 1 Jett Bag From CDR'S LH Handhold

Configure 500mm Lens Camr (Aft Eng Cvr):  
 Remove Tape From Camr & Lens  
 Install 500mm Lens  
 Stow Reseau Cover, Tape, Loose  
 Padding In Jett Bag  
 Install B&W Mag MM (Fwd RHSSC)  
 Stow Dark Slide In Mag Pkt  
 Install Trigger, RCU/Camr Brkt,  
 Then Handle  
 Install Ring Sight  
 Stow 500mm Lens Camr In Purse

Stow Camr Bag In Jett Bag  
 Stow LM Mag Bag In LCG Compt (RHSSC)

Verify 70mm Camr Configured, Mag LL  
 Installed & Stowed In Camr Compt

SEVA PREP

Apply Antifog (LMP LEVA bag), Wipe Dry  
 With Tissue (LHSSC)

Stow EMU Maintenance Kit In purse  
 Stow LEVA's, Helmets & EV Gloves On  
 Eng Cover  
 Stow LEVA Bags Under OPS

Audio (CDR & LMP):  
 MODE - VOX  
 VOX SENS - As Reqd

Comm Check With Each Other And Hou

HELMET/GLOVE DONNING

LM O2 Hoses, R/R & B/B  
 Position Mikes (Both)  
 Don Helmets  
 Don LEVA's

Verify The Following:

Helmet & Visor (1) - Aligned &  
 Adjusted

O2 Connectors (2) - Locked

Connector Plugs (2) - Locked

COMM Connectors (1) - Locked

PGA Diverter Vlv (1) - Horizontal

Don EV Gloves & Verify

Wrist Locks (4) - Locked

Glove Straps (4) - Adjusted

PRESS INTEGRITY CHECK

**NOTE:** LM Suit Circuit Shall Not Be  
 Maintained At Elevated Press >5 Min

SUIT GAS DIVERTER - PULL-EGRESS (Ver)  
 CABIN GAS RETURN - EGRESS (Verify)  
 SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS  
 PRESS Reg B - DIRECT O2  
 Monitor Cuff Gage To 3.7 - 4.0 Psig  
 Then PRESS REG B - EGRESS (Cuff  
 Gage Decay <.3 Psig In 1 Min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt  
 Press Decays To 4.8 Psia)

CABIN DEPRESS FOR SEVA

Confirm Go For DEPRESS From Hou  
 CB(16) ECS: CABIN REPRESS - Open  
 Ovhd Or Fwd Dump Valve, OPEN Then AUTO  
 At 3.5 Psia  
 (Verify Cabin Press 3.5 Psia  
 & LM Suit Circuit Lockup At 4.3  
 Psia & Decaying)

Ovhd Or Fwd Dump Vlv - OPEN (Verify LM  
 Suit Circuit 3.6 To 4.3 Psia)





HATCH OPENING

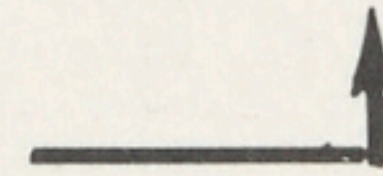
Partially Open Ovhd Hatch  
Ovhd Or Fwd Dump Valve - AUTO  
Ovhd Hatch - Full Open & Latched

CDR Sit On Eng Cover, Facing Fwd  
Unlock Drogue, Rotate CW To Release

NOTE: LMP Block Direct Sun Impingement  
On Instrument Panels

Lower And Pitch Drogue Fwd 90°  
Hand Drogue To LMP  
Stow Drogue In CDR's Station

CDR Stand On Eng Cover

SEVA

Identify Landmarks For LM Location

Shoot 360° Stereo Pan With 60mm Lens  
(22 FR)

Check Traverse Routes For Landmarks  
Trafficability & ALSEP Location

Check Far Field Geology:

Front  
Rille  
North Complex  
Mare  
Boulder Fields

Shoot 500mm Lens Photography (Lens  
Cover To Camr, Velcro)

Check Near Field Geology:  
Affects of Descent Engine  
Fragment Distribution  
Craters  
Boulders  
Soil

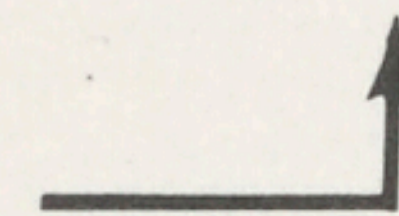
Confirm Best ALSEP Location

HATCH CLOSING

CDR Sit On Eng Cover, Facing Fwd  
LMP Hand Drogue To CDR

Install Drogue, Rotate CCW To Stop,  
& Lock

Ovhd Hatch - Close & Lock

CABIN REPRESS

Dump Valves (Both) - AUTO (Verify)  
CABIN REPRESS - AUTO (Verify)

CB(16) ECS: CABIN REPRESS - Close  
MASTER ALARM & CABIN Warning Lt - On  
Verify Cabin Press Increasing  
PRESS REG A & B - CABIN

CABIN Warning Lt - Off  
Verify Cabin Press Stable At 4.6-5 Psia

POST SEVA SYSTEMS CONFIGURATION

Doff Gloves, Stow On Comm Panel  
Doff Helmets With Visors, Stow In  
Helmet Bag  
Verify Safety On Dump Valve

LM 02 Hoses, R/B & B/R

Audio (CDR & LMP):  
MODE - ICS/PTT

VOICE - DN VOICE BU

POST SEVA CABIN CONFIGURATION

Install Lens Cover On 500mm Lens, Ver  
Disconnect BSLSS Bag, Stow Under Purse  
Unstow Lunar Surface Checklist, 2-5  
Stow SEVA Cue Card



7/1/71

ONE MAN EVA

Verify EVA Crewman in CDR's Station

Verify The Following (Both):  
Helmet & Visor (2) - Aligned & Adjusted  
O2 Connectors (7) - Locked  
Purge Valve (1) - Locked  
H2O Connectors (2) - Locked  
Comm Connectors(2) - Locked

Don EV Gloves & Verify:  
Wrist Locks (4) - Locked  
Glove Straps (4) - Adjusted

**NOTE:** If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)  
PLSS PUMP - ON (Rt)

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

**NOTE:** LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS(Verify)  
CABIN GAS RETURN - EGRESS (Verify)  
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS  
PRESS REG B - DIRECT O2  
Monitor Cuff Gage To 3.7 - 4.0 Psig  
Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)



(EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-0)  
Press Flag Clear (3.1-3.4 Psid)  
Cuff Gage 3.7-4.0 Psig  
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For 1 Min, Report Decay)  
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)  
Verify O2 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou  
CB(16)ECS: CABIN REPRESS - Open  
For TV Thru LM, CB(16) Comm: TV - Close  
CABIN REPRESS VLV - Close

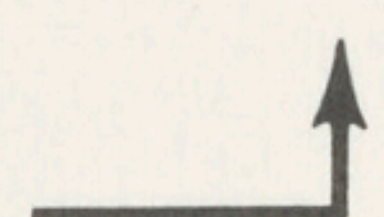
Ovhd Or Fwd Dump Valve - OPEN Then AUTO  
At 3.5 Psia (Verify EVA Crewman Cuff Gage Does Not Drop Below 4.6 Psig)

Verify:  
Cabin At 3.5 Psia  
LM Suit Circuit Lockup At 4.3 Psia & Decaying  
PLSS/OPS/PGA > 4.6 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN  
Verify:  
Tone-On & H2O Flag - A (1.2-1.7 Psia)  
LM Suit Circuit 3.6 To 4.3 Psia & Decaying  
PLSS/OPS/PGA > 4.6 Psig & Decaying

Partially Open Fwd hatch



FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag - Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient  
Verify:  
PLSS/OPS/PGA 3.7 To 4.6 Psig  
CWEA Status:  
Caution  
PREAMPS

Lower EV Visor  
Release PLSS Antenna :10

POST ONE-MAN EVA

Perform POST EVA 1,2 or 3 As Applicable



7/22/71

ONE MAN EVA

CABIN PREP-Perform EVA 1,2 Or 3 As Reqd

EQPT PREP-Perform EVA 1, 2 Or 3 As Reqd

PLSS DONNING-Perform EVA 1,2or3 As Reqd

Position Post EVA 1, 2 or 3 Cue Card For Post EVA

NON EVA CREWMAN-Connected To LM 02, Comm, & H2O Gas Connector Plugs In PGA PGA Diverter Vlv - Horizontal

EVA CREWMAN: PGA Diverter Vlv - Vertical CSRC In PGA Pkt

PLSS COMM CHECK

IVA PNL

Verify Powerdown CB Configuration (White Dots Out)

Verify LM EVA Antenna Deployed For TV Thru LM, COMM: MODULATE - FM

Verify Voice Comm With Hou PWR AMP - CLOSED PRIM

H Audio (Non EVA Crewman)

O S-BAND - T/R

U ICS - T/R

& RELAY - OFF

MODE - VOX

E VOX SENS MAX

V VHF A - RCV

A B - T/R

Audio (EVA Crewman)

S-BAND - T/R

ICS - T/R

RELAY - ON

MODE - VOX

VOX SENS MAX

VHF A - RCV

B - T/R

COMM:

VHF A XMTR - OFF

H A RCVR - ON

O B XMTR - VOICE

U B RCVR - ON

& TLM BIOMED - NON EVA CREWMAN

SQUELCH VHF A&B -

E Noise Thres + 1 1/2

V RECORDER - ON

A VHF Antenna - EVA

AUDIO CB - Open

EVA Crewman Connect to PLSS Comm

H AUDIO CB - Close

O RCU PTT - MAIN (Rt), Verify

U PLSS Mode-B, Blade-CCW

(Tone-On, Vent Flag-P,

Press Flag-0, 02 Mom)

H PLSS 02 Press Gage >85%

O

U Comm Check With Each Other & Hou

& NOTE: Unstow PLSS Antenna If It Transmits Garbled And/Or Loses TM.I

V Audio (CDR & LMP)

H VHF A - T/R

O VHF B - RCV

COMM:

H VHF A XMTR - VOICE

O VHF B XMTR - OFF

U PLSS Mode - A, Wheel-CCW (Tone-On)

H Perform Comm Check With Each Other &

O Comm & TM Check With Hou

U Read PLSS 02 Qty To Hou

& NOTE: If Comm Is NO GO With Hou

E S-BD MOD - PM

V Verify Comm & TM

A

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close

LCG - Cold, As Reqd

CB(16) ECS: CABIN REPRESS - Close (Ver)

SUIT FLOW CONT- Open

SUIT GAS DIVERTER - PULL-EGRESS(Verify)

CABIN GAS RETURN - EGRESS (Verify)

SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

SUIT ISOL - SUIT DISC

Discon LM 02 Hoses, Secure About PGA

Connect OPS 02 Hose To PGA B/B

Retrieve Purge Valve (Purse) -

Verify Closed, Lock Pin In & LO

Install Purge Valve In PGA R/R

H Drink

O DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

V Position Mikes (Both)

A PLSS FAN - ON, Rt (Vent Flag - Clear)

Don Helmets, Check Drink Bag Position

Don LEVA

EVA Crewman:

LCG - COLD, As Reqd

Disconnect LM H2O Hose

Connect PLSS H2O Hose

Stow LM Hoses





# SIM PWR DOWN

7/13/71

## SIM PWR DOWN - DUMPS [SPS]

LOGIC PWR (2) - DPLY/RETR  
MAP CAM TRACK - RETRACT  
(tb bp ~4 min - gray) - OFF (ctr)  
MAP CAM ON - STBY (pause 30 sec in OFF)  
MAP CAM IMAGE MTN - OFF  
LASER ALTM - OFF  
GAMMA RAY EXP - ON [OFF for SPS]  
MASS SPEC ION SOURCE - OFF  
MASS SPEC EXP - STBY [OFF for SPS]  
DATA SYS ON - ON [OFF for SPS]  
PAN CAM MODE - STBY (Verify lens stow)  
PAN CAM PWR - OFF [BOOST for SPS]  
PAN CAM SELF TEST - HTRS  
 $\alpha$  RAY/X DR -  $\alpha$  ON [ $\alpha$  OFF for SPS]  
X-RAY - STBY [OFF for SPS]  
GAMMA RAY BOOM DPLY - RETRACT [SPS only]  
(tb bp ~180 sec - gray) - off (ctr)  
If ION SOURCE is OFF for 5 min:  
MASS SPEC BOOM DPLY - RETRACT  
(tb bp ~165 sec - gray) - off (ctr)  
If LA is OFF & MC is retracted:  
MAP CAM/LASER EXP COVERS - CLOSE  
(tb bp ~2 sec - gray) - off (ctr)  
ALPHA/X-RAY EXP COVERS - CLOSE  
(tb bp ~2 sec - gray) - off (ctr)  
LOGIC PWR (2) - OFF  
S-BD AUX TV - SCI [OFF for SPS]  
If booms full retr:  
AUTO RCS SEL - as reqd  
cb SCS CONTR/DIRECT 1 - MNB, 2 MNA - close

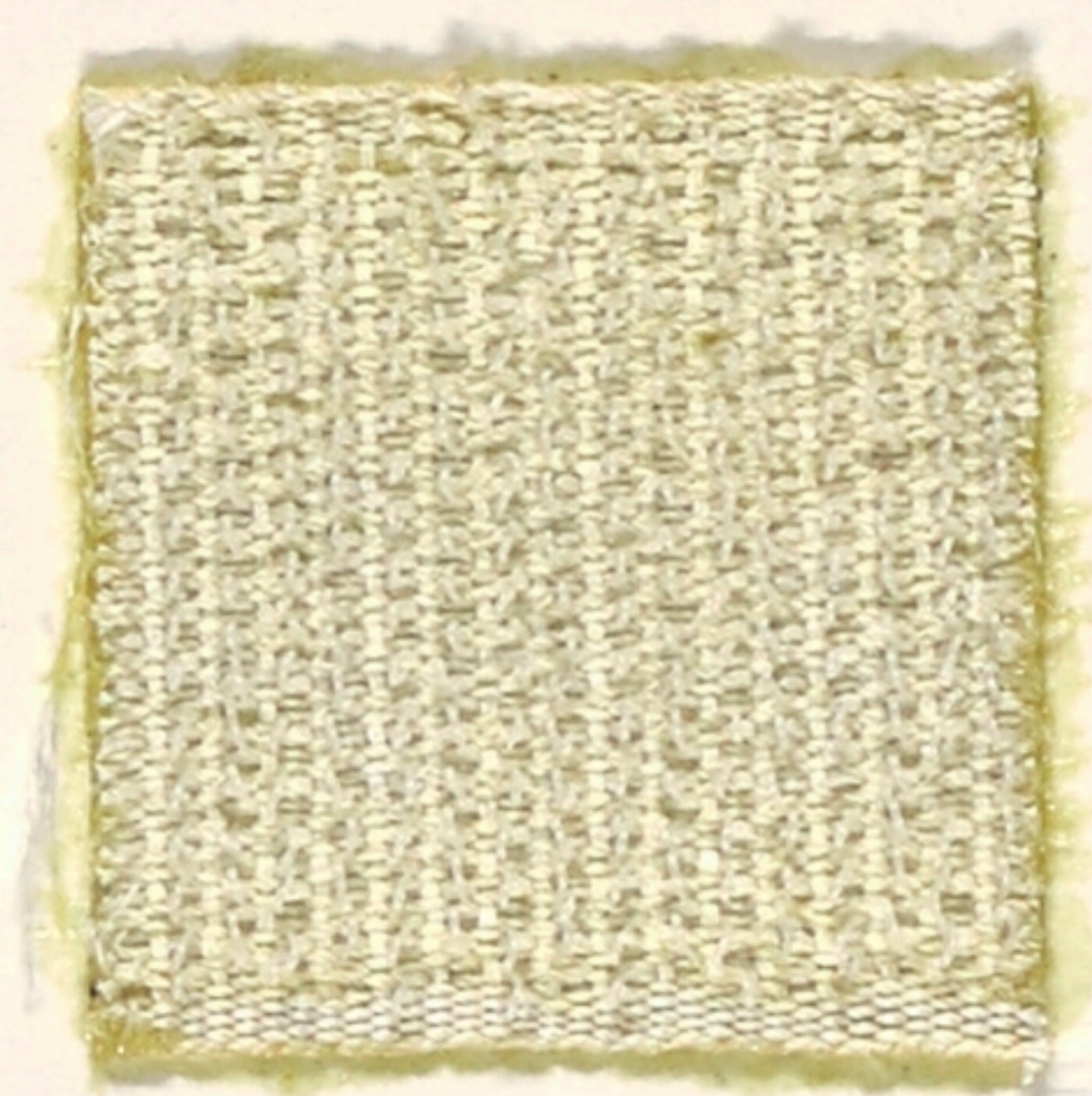
## SIM PWR DOWN (MIN POWER)

✓ SIM PWR DOWN for SPS complete  
PAN CAM SELF TEST - OFF (ctr)  
If no SPS burn expected:  
MAP CAM ON - OFF  
PAN CAM PWR - OFF (ctr)  
SM/AC PWR - OFF

*Flown in lunar orbit for 6 days during Apollo 16.  
done Scott - CRT,*



7/1/71





S-BAND  
 ANTENNA ANGLES  
 DESCENT REFSMMAT

YAW=0°		IGA (PITCH)
ANTENNA		
P	Y	
72	-63	0
53	-60	10
38	-55	20
26	-49	30
17	-42	40
8	-35	50
1	-28	60
-6	-21	70
-13	-14	80
-20	-7	90
-26	-1	100
-34	5	110
-41	11	120
-50	16	130
-58	20	140
-68	23	150
282	25	160
271	26	170
261	26	180
251	24	190
241	21	200
232	17	210
223	12	220
215	7	230
208	1	240
201	-6	250
194	-12	260
188	-19	270
181	-26	280
174	-33	290
166	-40	300
156	-47	310
145	-53	320
131	-59	330
113	-62	340
93	-64	350





5/10/71



# G&N/SCS EMER

## G&N

5/10/71

### SCS SWITCH OVER

SCS TVC - AUTO  
SC CONT - SCS  
Ck ATT  
DIR ULL & THRUST ON

### NO CUTOFF

cb SPS PILOT VLVS - open

### EMS & DSKY STILL COUNTING AFTER SHUTDOWN

SC CONT - SCS  
THC PWR - OFF  
cb DIR ULL (2) - open  
AUTO RCS - OFF  
SM RCS PRPLNT (QUAD) - OFF

## SCS

### NO START OR EARLY ECO

SPS THRUST - DIRECT (Mom)

### RATE NEEDLES HARDOVER & FDAI'S DIVERGE

BMAGS - RATE 1 (dn)  
THC - CW  
Use MTVC

### ABNORMAL DYNAMICS IN AUTO

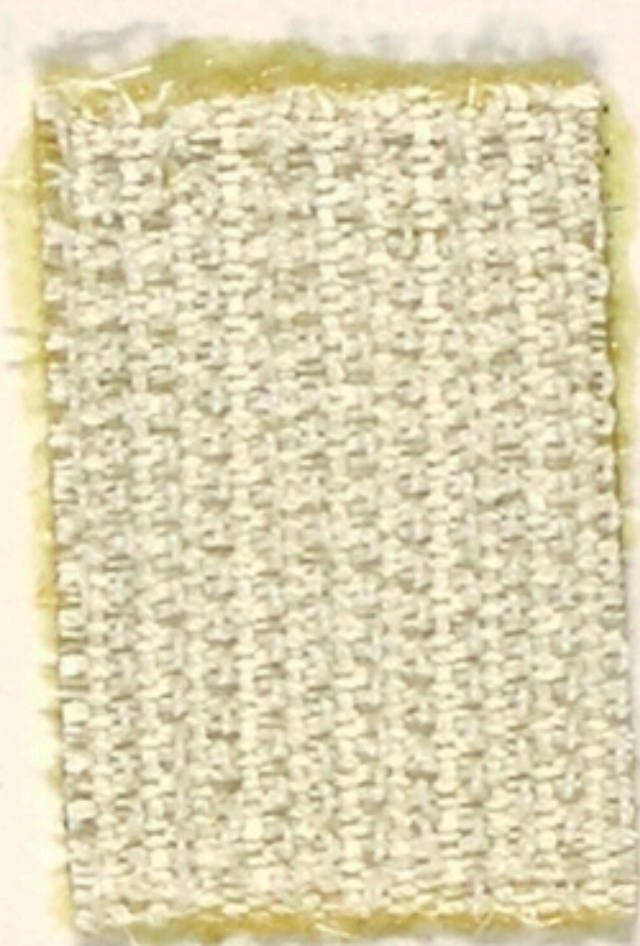
THC - CW  
Use MTVC  
BMAGS - RATE 2 (up)

### ABNORMAL DYNAMICS IN MTVC

THC - CW  
If PROBLEM PERSISTS:  
SHUTDOWN  
AUTO RCS - OFF



5/10/71





LM COMM MODES

COMM BASIC CONFIGURATION	PRIOR TO DOCKING	PREP FOR UNDOCKING	LM RELAY WITH VHF RNG	CSM RELAY	LUNAR STAY	PLSS/EVCS WITH TV (EVA)	PLSS/EVCS WITH LCRU (EVA)
CB 11 ALL COMM CLOSED							
PNL 8 AUDIO SWITCHES							
S-BD T/R - T/R				REC			
ICS T/R - T/R							
RELAY ON/OFF - OFF							
MODE - ICS/PTT			VOX			VOX	VOX
AUDIO CONT - NORM							
VHF A - T/R					OFF	OFF	OFF
VHF B - OFF	RCV	RCV	RCV	REC	RCV		
VOX SENS - MAX INCR							
CB 16 ALL COMM CLOSED							
CB 16 TV - OPEN						CLOSED	OPEN
PNL 14 UPSQU - AS DES	ENABLE	ENABLE	ENABLE	OFF	OFF*	ENABLE	ENABLE
PNL 12 UPDATA LNK-OFF							
PNL 12 AUDIO SWITCHES							
S-BD T/R - T/R			RCV	REC			
ICS T/R - T/R							
RELAY ON/OFF - OFF			ON			ON	ON
MODE - ICS/PTT			VOX			VOX	VOX
AUDIO CONT - NORM							
VHF A - T/R					OFF		
VHF B - OFF	RCV	RCV	RCV	REC	RCV	RCV	RCV
VOX SENS - MAX INCR							
PNL 12 COMM SWITCHES							
S-BD MODULATE - PM						FM	PM
S-BD XMTR/RCVR - SEC							
S-BD PWR AMPL - PRIM							OFF
S-BD VOICE - VOICE							
S-BD PCM - PCM							
S-BD RNG - OFF/RESET		RANGE			AS REQ		
VHF A XMTR - VOICE	VOICE/RNG		VOICE OR VOICE/RNG	VOICE RNG	OFF		
VHF A RCVR - ON			OFF	OFF			
VHF B XMTR - OFF				OFF	OFF		
VHF B RCVR - OFF	ON	ON	ON	ON		ON	ON
SQUELCH VHF A - NORM						N+1 1/2	N+1 1/2
SQUELCH VHF B - NORM						N+1 1/2	N+1 1/2
TLM BIOMED - AS REQ	RIGHT	LEFT	OFF			OFF	OFF
TLM PCM - HI		LO					
RECORDER - OFF	AS DES	AS DES	AS DES	AS DES	AS DES	ON	ON
PNL 12 COMM ANTENNAS							
TRACK MODE - AUTO					AS REQ	SLEW	SLEW
PITCH CONT - COMP 4							
YAW CONT - COMP 4							
S-BD SEL - SLEW							
VHF SEL - AFT OR FWD					AFT	EVA	EVA

\*DURING EVA - ENABLE.



LOSS OF COMM (PDI)

- 1 VERIFY STANDARD COMM CONFIG
- 2 S-BD SIG STR LOW (<3.0)-REACQ WITH STEERABLE
- 3 STILL NO COMM(SIG STR LOW<3.0)-SELECT BEST OMNI
- 4 STILL NO COMM  
DN VOICE BU, BIOMED - OFF (HOT MIKE)
- 5 STILL NO COMM  
S-BD: XMTR/RCVR-PRIM,PWR AMPL-SEC
- 6 60 SEC, STILL NO COMM  
VOICE and FM
- 7 60 SEC, STILL NO COMM  
CSM RELAY

PM

S-BD AUDIO (BOTH) - OFF  
NOTIFY CSM TO CONFIG FOR RELAY

LOSS OF COMM (EVA)

- 1 CK COMM CBs
- 2 SEL ALT S-BD XMTR/RCVR
- 3 IF SIG STR METER < 3.9,  
SEL STEERABLE ANT
- 4 CONFIG FOR CDR RELAY:  
AUDIO (LMP) AUDIO (CDR)  
RELAY-OFF RELAY-ON  
VHF A-OFF VHF A-T/R  
VHF B-OFF VHF B-RCV  
IF COMM OK, PLSS MODE-AR
- 5 CONFIG LM TO B/U EVA MODE  
XMTR A-OFF  
XMTR B-VOICE  
AUDIO (CDR)  
VHF A-RCV  
VHF B-T/R  
PLSS MODE-A(CDR), B(LMP)
- 6 S-BD - DN VOICE BU
- 7 UPDATA LINK - VOICE BU
- 8 VHF ANT-AFT

LM COORD	STER ANT	
	PITCH	YAW
+X	90	-45
-X		
+Y	90	45
-Y		
+Z	0	0
-Z	180	0



# CDR MAN P

↑  
LAUNCH  
ABORT

↓ PITCH

DECR

↑

↓  
INCR

JULY 26 & 27

DET	θ	VI	HDOT
2:39	24	9	3307
3	24	9	2904
3:30	19	9	2437
4	17	10	1958
4:30	16	11	1517
5	14	12	1115
5:30	12	13	757
6	9	14	448
6:30	7	15	193
7	5	16	5
7:30	2	18	-102
8	5	19	-117
8:30	359	21	-98
9	356	22	-32
9:10	356	22	10
9:30	353	23	-56
10	350	23	-108
10:30	348	24	-125
11	346	24	-101
11:30	345	25	-33
11:39	345	25	-1
11:49	VI = 25,599		

7/1/71

MNA

1. FDAI - 2

2. BMAGS-RT 2

3. Y TVC-RT CMD

4. TV GMBL DR - 2

A. AUTO RCS - MNB

B. cb SPS P2&Y2 - open

C. ΔV THRUST B - NORM

D. RHC DIR 2 - MNB

E. CM DUMP w/RHC

MNB

1. TVC GMBL DR - 1

A. AUTO RCS - MNA

B. cb SPS P1&Y1 - open

C. CM DUMP w/RHC

AC2

1. BMAGS - RT 1

2. SCS TVC - AUTO

3. TVC SERVO - AC1

A. MTVC w/TRIM TW

B. OUT: GPI2, MTVC

AC1

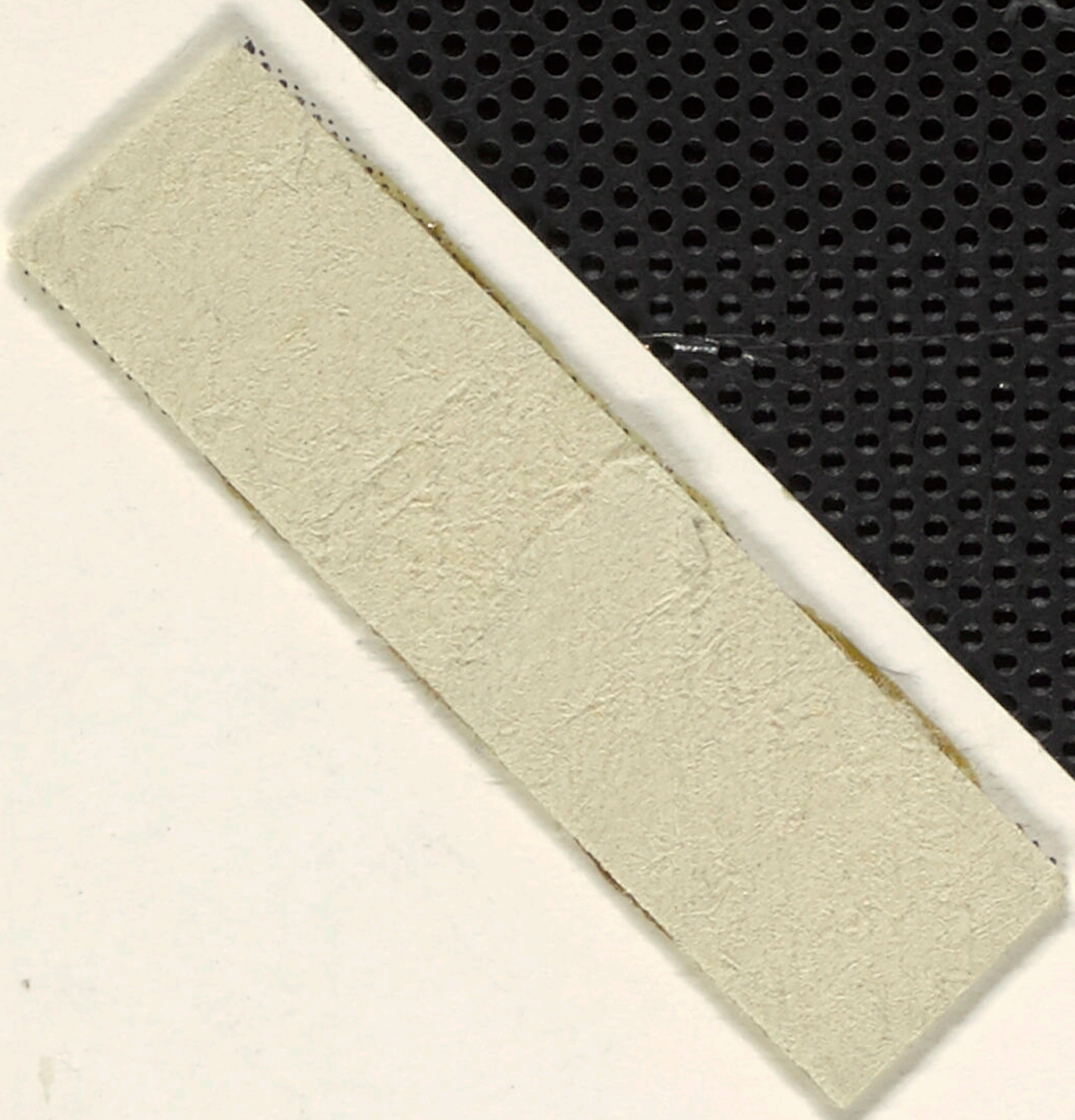
1. FDAI - 2

2. BMAGS - RATE 2

3. TVC SERVO - AC2

A. OUT: EMS ΔV, GPI1





BUS LOSS DURING BURN

5/10/71

G&N

MNA: GMBL DR - 2

MNB: GO

AC1: TVC SERVO - AC2

AC2: GO

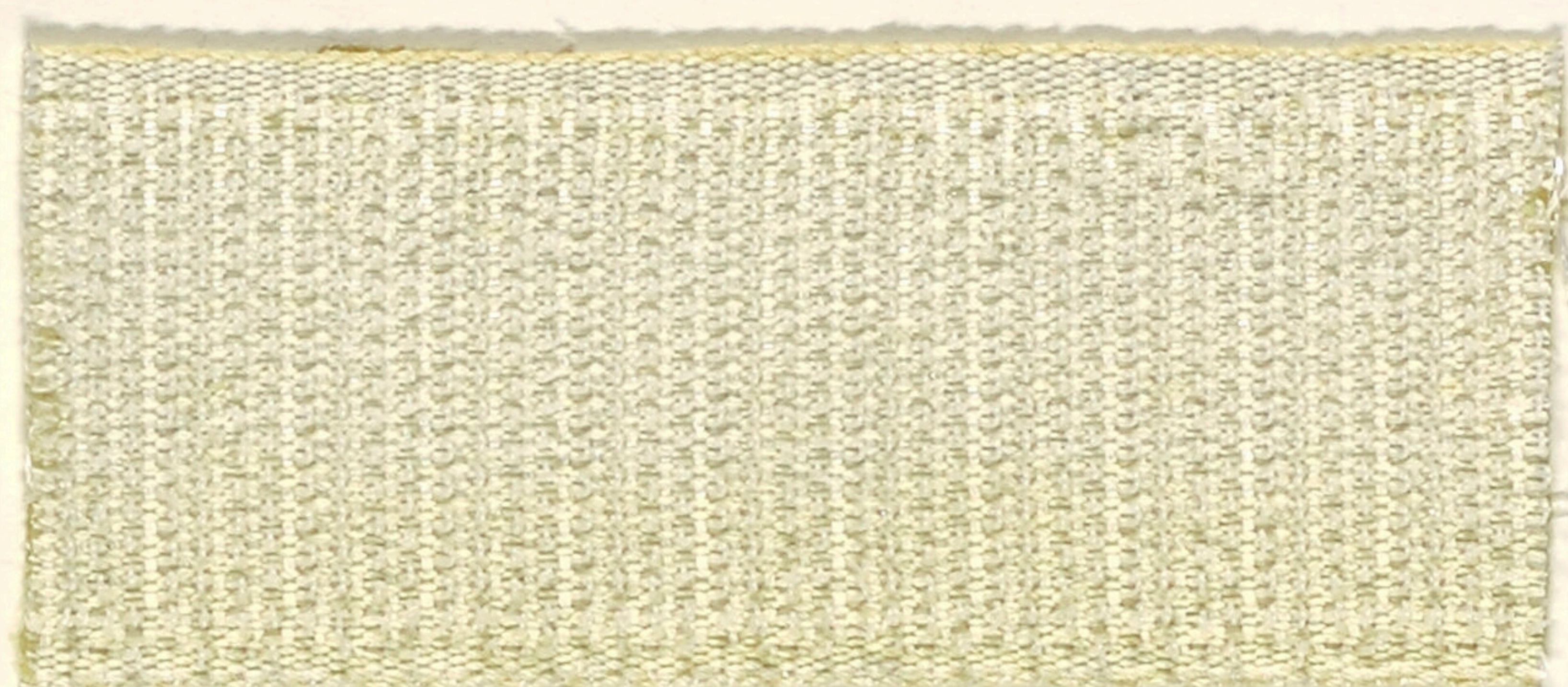
SCS

ANY BUS:

SHUTDOWN

RECONFIGURE

IGNITE





LGC + DC BUS + BATT

GUID CONT - AGS  
DES ENG OVRD - ON  
CDR AUDIO - BU  
GLYCOL - SEC  
SUIT FAN - 2  
DPS MANUAL - OFF  
(ARM, OVRD, STOP)

START (MAN)  
GASTA  
THRUST, TAPE  
RCS - FEED A  
RR, LR  
INV 1  
DIR, PULS, +X

CES DC + DC BUS + BATT

GUID CONT - PGNS  
SUIT FAN - 1  
LMP AUDIO - BU  
INV - 1  
ABT STG:  
ENG ARM - ASC  
MAN START, MAN STOP

DES OVRD  
AUTO THROT, TH CMD  
AUTO IGN, AUTO OFF  
RATE NEEDLES  
RCS - FEED B, XFD  
RR SLEW, AUTO TRACK  
INV 2

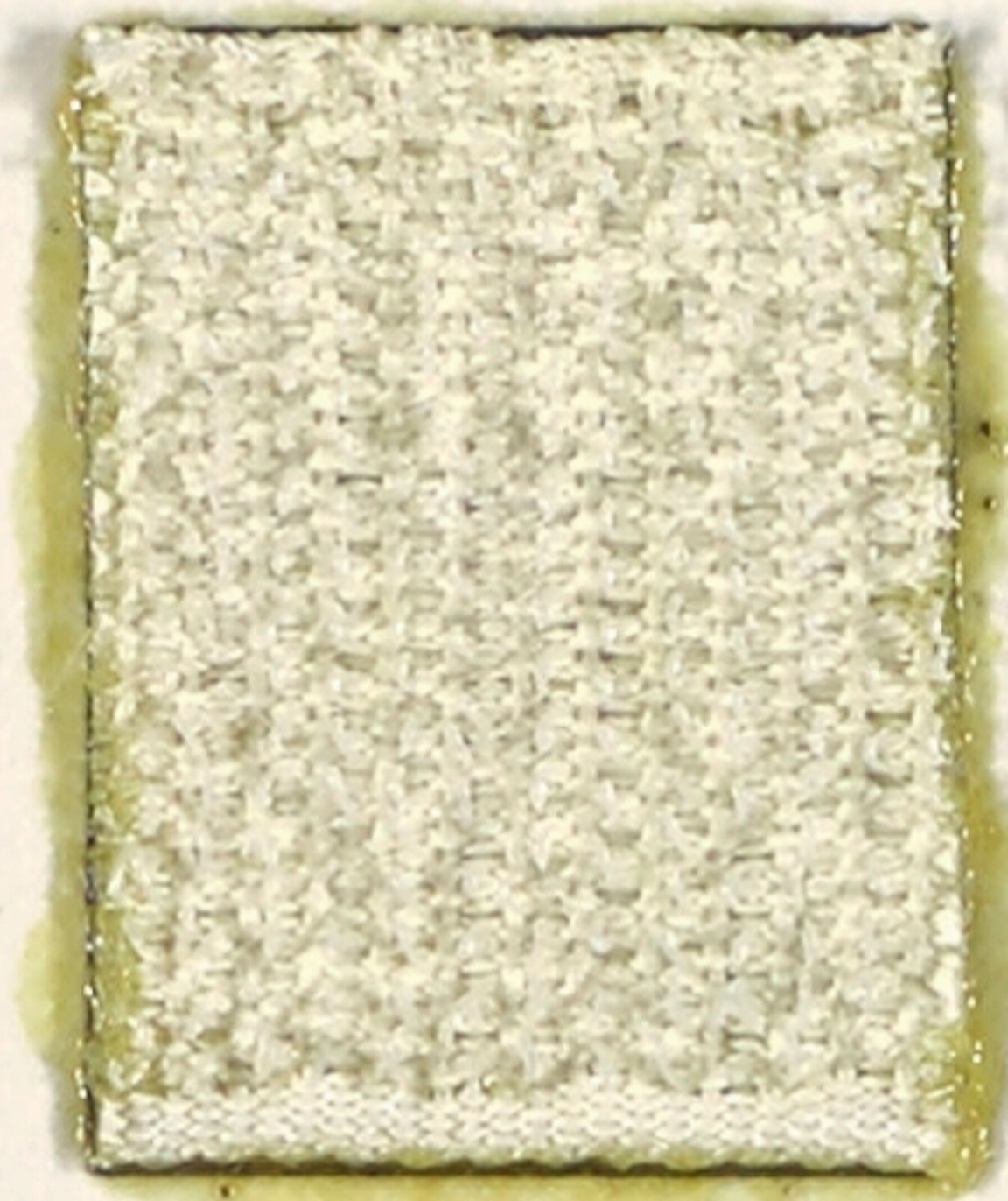
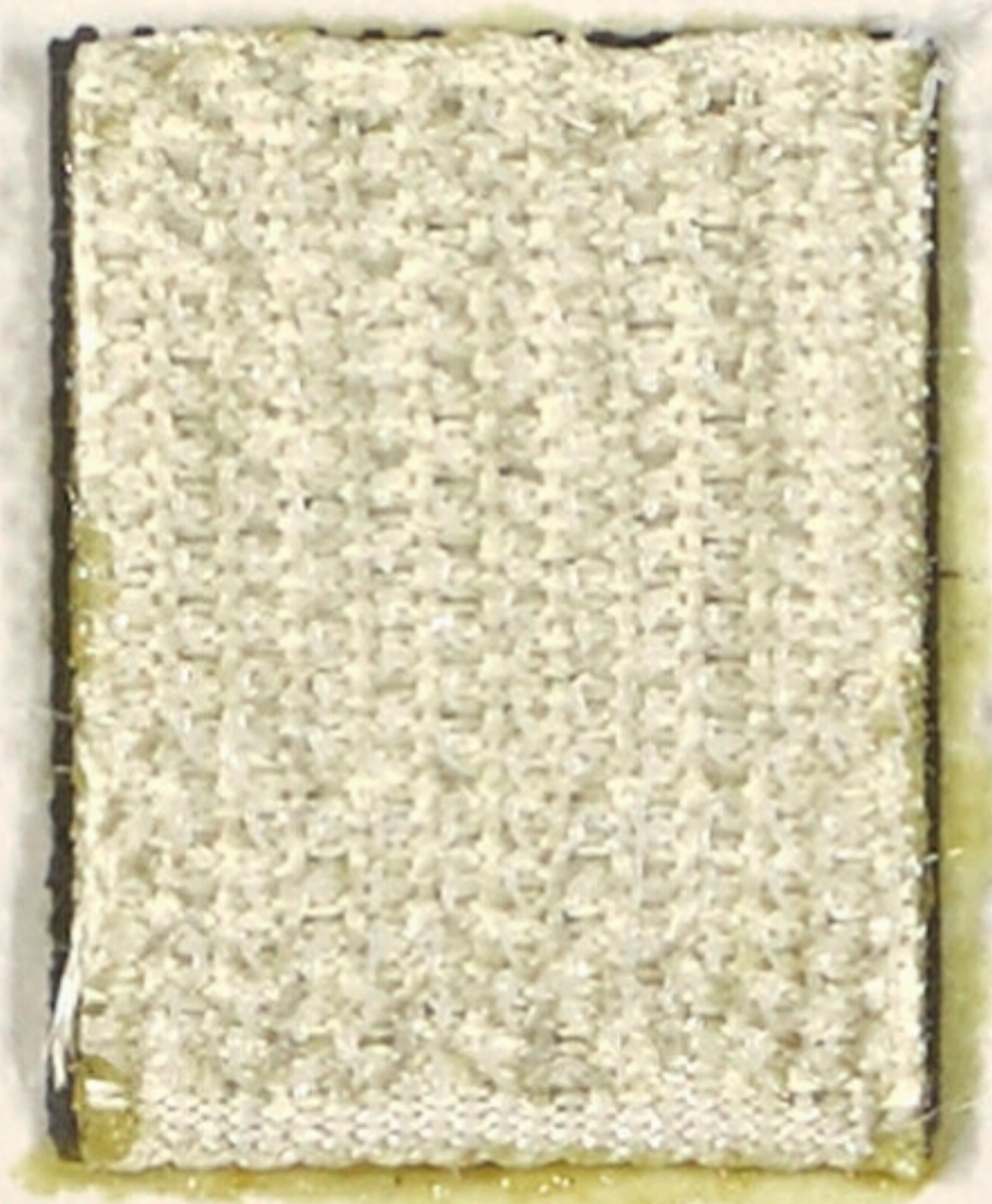
AC-A

CB BUS TIE A (2) - OPEN  
RR - LGC  
LMP FDAI - AGS  
GDA  
GASTA  
CDR FDAI  
TAPE HDOT/RDOT

AC-B

CB BUS TIE B (2) - OPEN  
CDR FDAI - PGNS  
DEDA  
FDAI - AGS  
LMP - FDAI





5/10/71



PRE-DOCK CHECKLIST, SOLO BK

If CSM active:

P47 at R = 1.25nm

SEC PRPLNT FUEL PRESS (4) - OPEN

V83E; N83E then KEY REL (V83)

DAC & TV - ON (LM photos)

EMS - STBY/OFF

EXT RNDZ LT - OFF

LM STATION KEEP

POO

DAC & TV - OFF

Photo MNVR:

BMAG (R,Y) - ATT 1/RATE 2

SC CONT - SCS

MAN ATT P - ACCEL CMD

CSM pitch up 360° at 2°/sec

End MNVR, Null rates

SC CONT - CMC

MAN ATT P - RT CMD

BMAG (3) - RATE 2

CMC MODE - AUTO

BRAKING GATES

R(nm)	R(fps)	RETICLE ANGLE(deg)	R(ft)
1.50	45	.08	9000
1.00	30	.13	6000
.50	20	.26	3000
.25	10	.54	1500
.08	5	1.60	500
.05		2.70	300
.03		4.00	200
.02		8.50	100



# TPF CONTINUED

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AT Docking ATT, Verify HGA P \_\_\_\_\_ Y \_\_\_\_\_  
BMAG (3) - ATT 1/RATE 2

Cue MSFN FOR LOGIC ARM

SECS LOGIC (2) - on

MSFN GO FOR PYRO ARM

SECS PYRO (2) - on (up)

P47

DAC & TV - ON

LM pitch dn 90°

XLATE to capture LATCH

At Capture:

PROBE tb (2) - bp

Report Capture to LM

SC CONT - CMC

CMC MODE - FREE

Allow motion to damp, 10 sec

When within 3° of DOCK ATT,

PROBE RETRACT SEC - 1

(PRIM - 2 if req)

At Latch:

PROBE tb (2) - gray

SECS PYRO (2) - SAFE

SECS LOGIC (2) - OFF

cb SECS ARM (2) - open

cb DOCK PROBE (2) - open

THC & RHC - LOCKED

BMAG (3) - RATE 2

PROBE EXTD/REL & RETR (2) - OFF

Go to SOLO BK DOCKING CHECKLIST,

AFTER HARD DOCK

DAC & TV - OFF

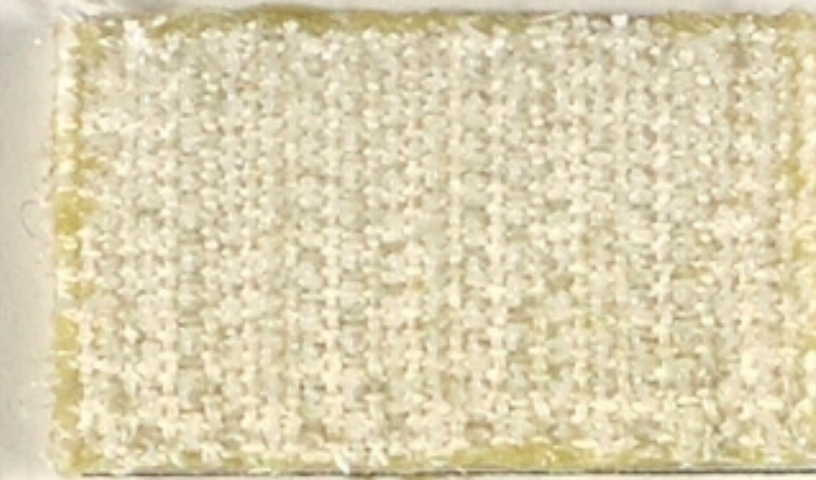
P00



DPS	APS	RCS
<u>TEMP/PRESS MON</u> >30 PSI @ PDI <u>HELIUM NOM</u> >1000<1150 PSI PRE PDI	<u>TEMP PRESS MON</u> >78 PSI OX >114 PSI FU 40 - 90°F ΔT<10°F NOM <u>HELIUM NOM</u> <u>PRESS 3125 PSI</u>	He >1400 PSI <u>PRPLNT</u> PRESS >100 PSI TEMP 40 - 100°F <u>FUEL/OXID MANF</u> PRESS >100 PSI ΔP <80 PSI <u>QUAD TEMP &gt;119°F</u> (25 MIN TO FIRING)

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MODES

# LAUNCH ABORT PAD

I I I I  
I I I I  
I I I I AK

5/10/71

✓✓✓*	<b>TIG</b> SECO + 2:05	
	<b>EMS ΔV</b>	6 9 9 9 . 9
*✓✓✓	<b>ΔV</b> — FOR HP >70	
	<b>CUTOFF</b>	
✓✓✓	<b>BT</b>	
✓✓✓	<b>P (IGN)</b>	
✓✓	<b>GET 300K</b>	
✓✓	<b>P (.05G)</b>	
✓✓	<b>GET DRO</b>	

\* TIG AT APOGEE

\* ΔV FOR 3350 NM SPLASH



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50



ft	=	nm
500	=	0.08
1000	=	0.16
1500	=	0.25
2000	=	0.33
2500	=	0.41
3000	=	0.49
3500	=	0.58
4000	=	0.66
4500	=	0.74
5000	=	0.82
5500	=	0.91
6000	=	0.99
6500	=	1.07
7000	=	1.15
7500	=	1.23
8000	=	1.32
8500	=	1.40
9000	=	1.48
9500	=	1.56

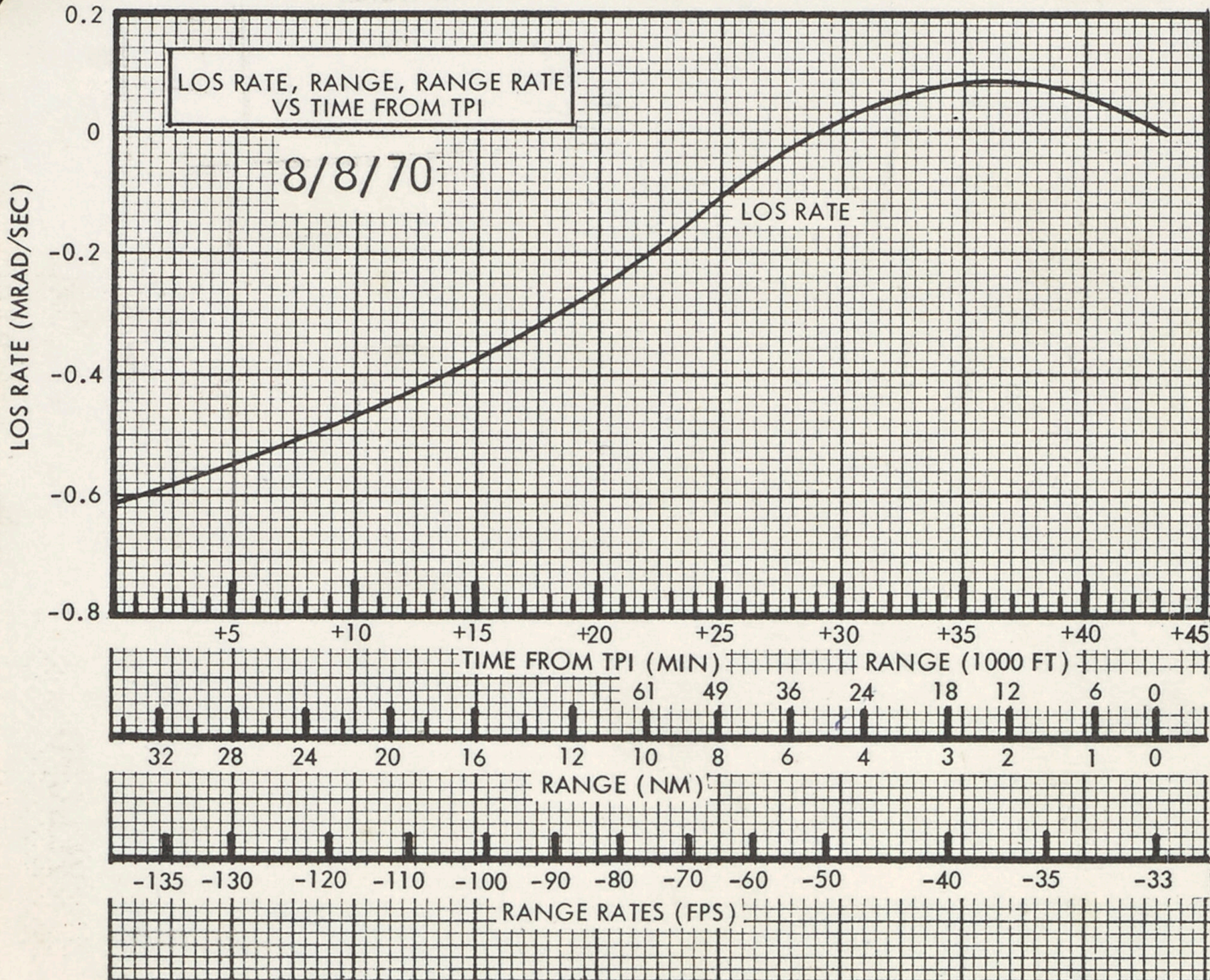
5/10/71



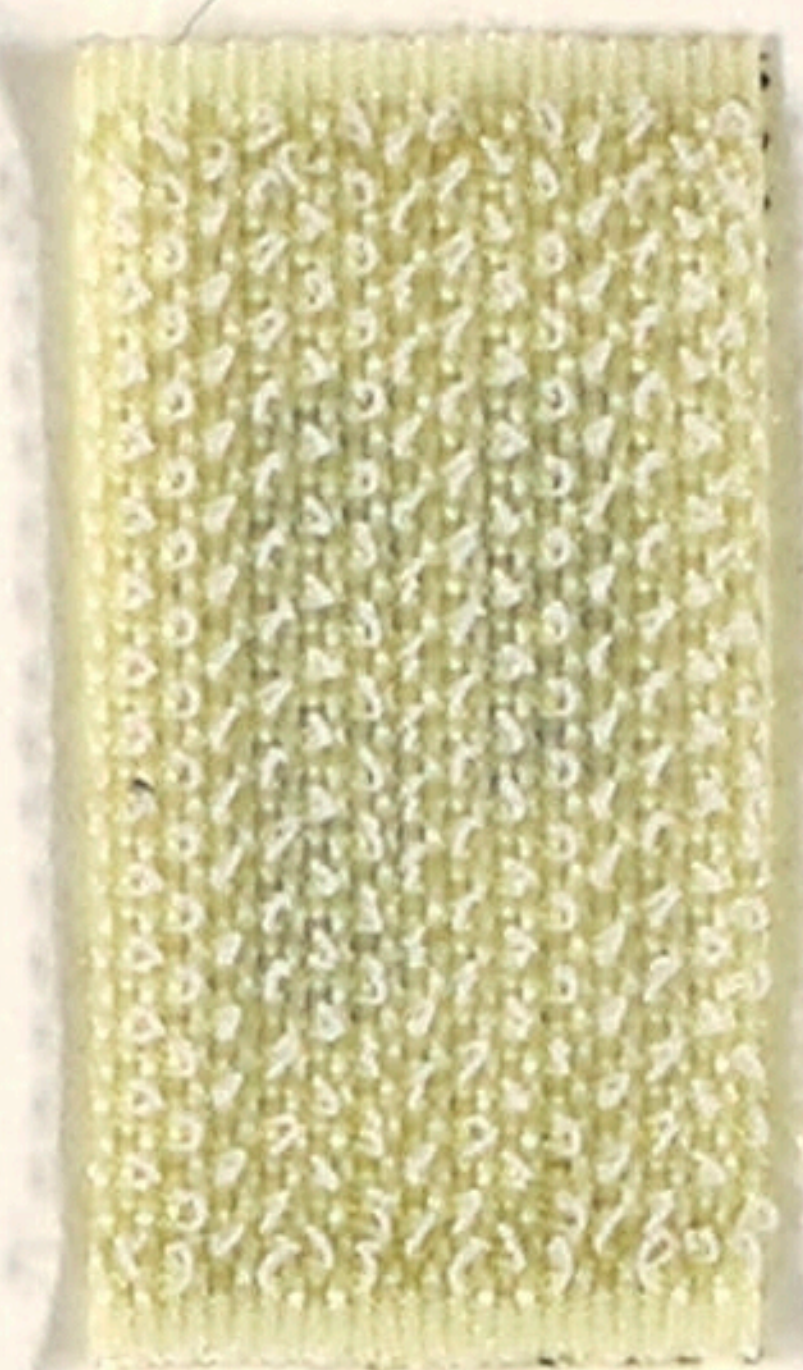
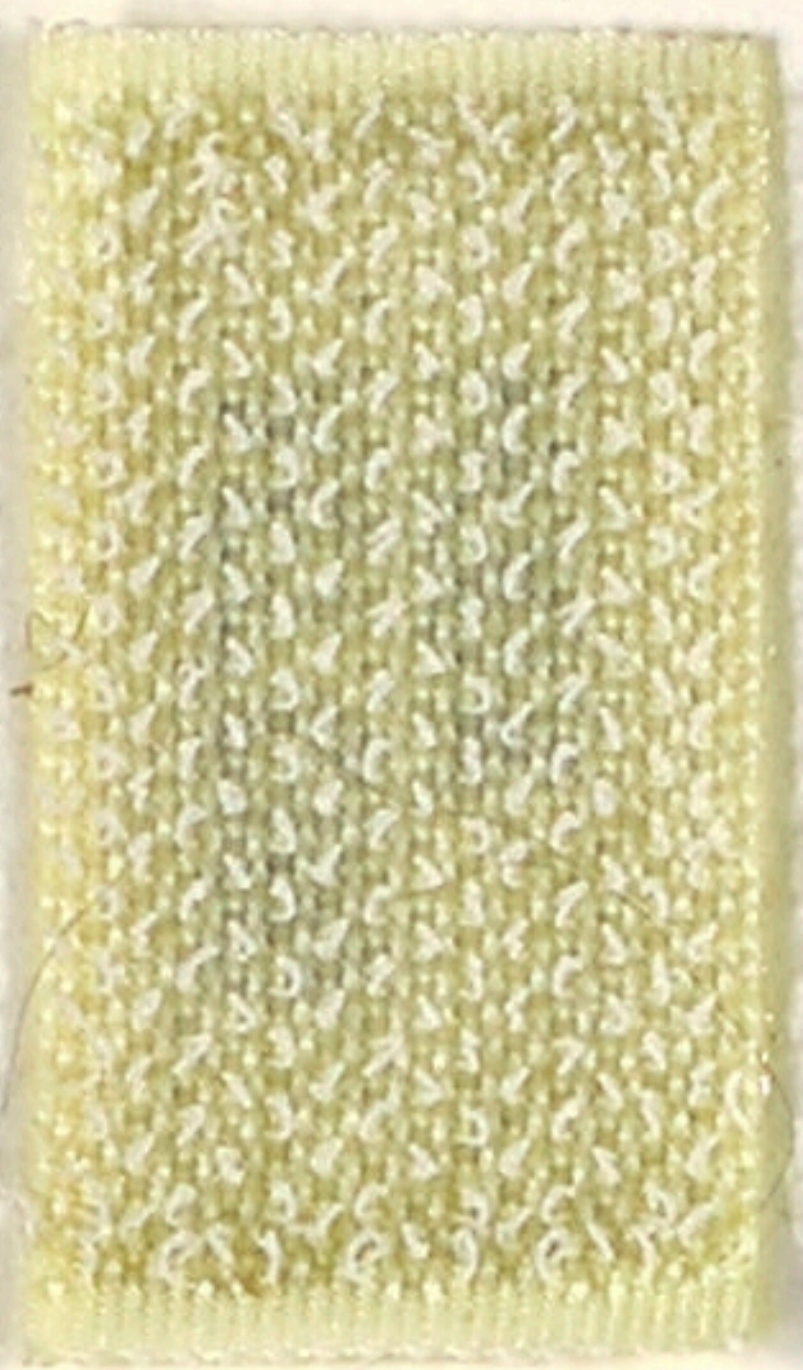


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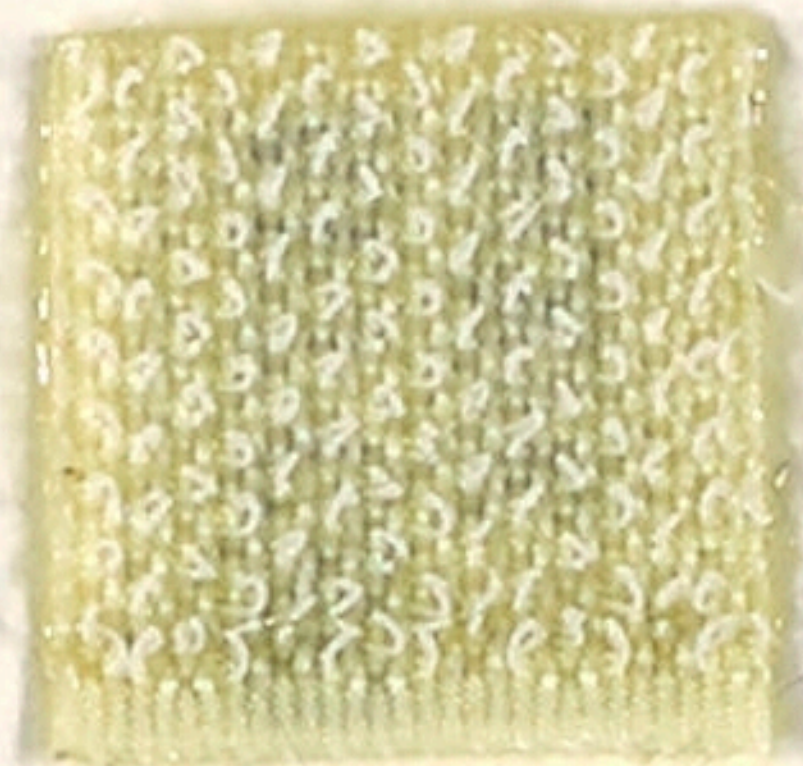
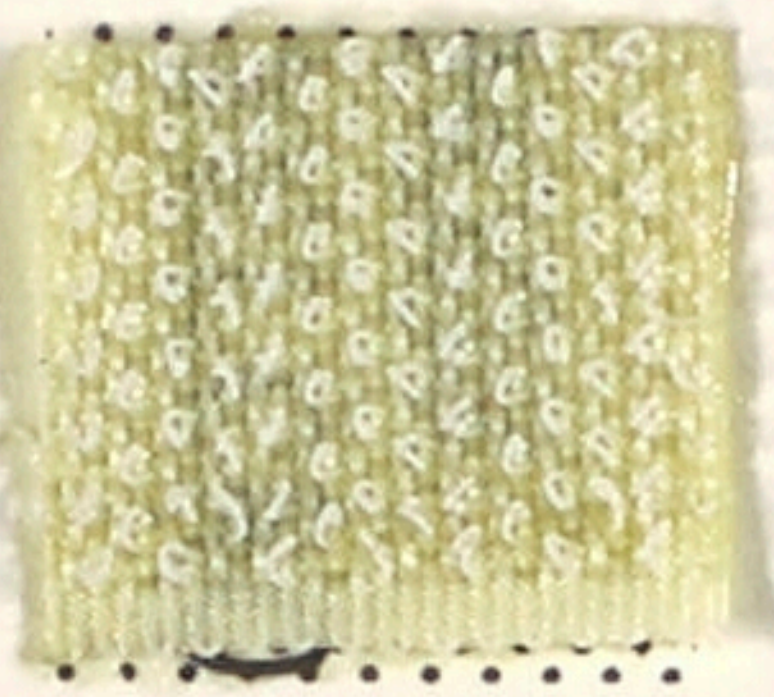






1

MS  
LMS

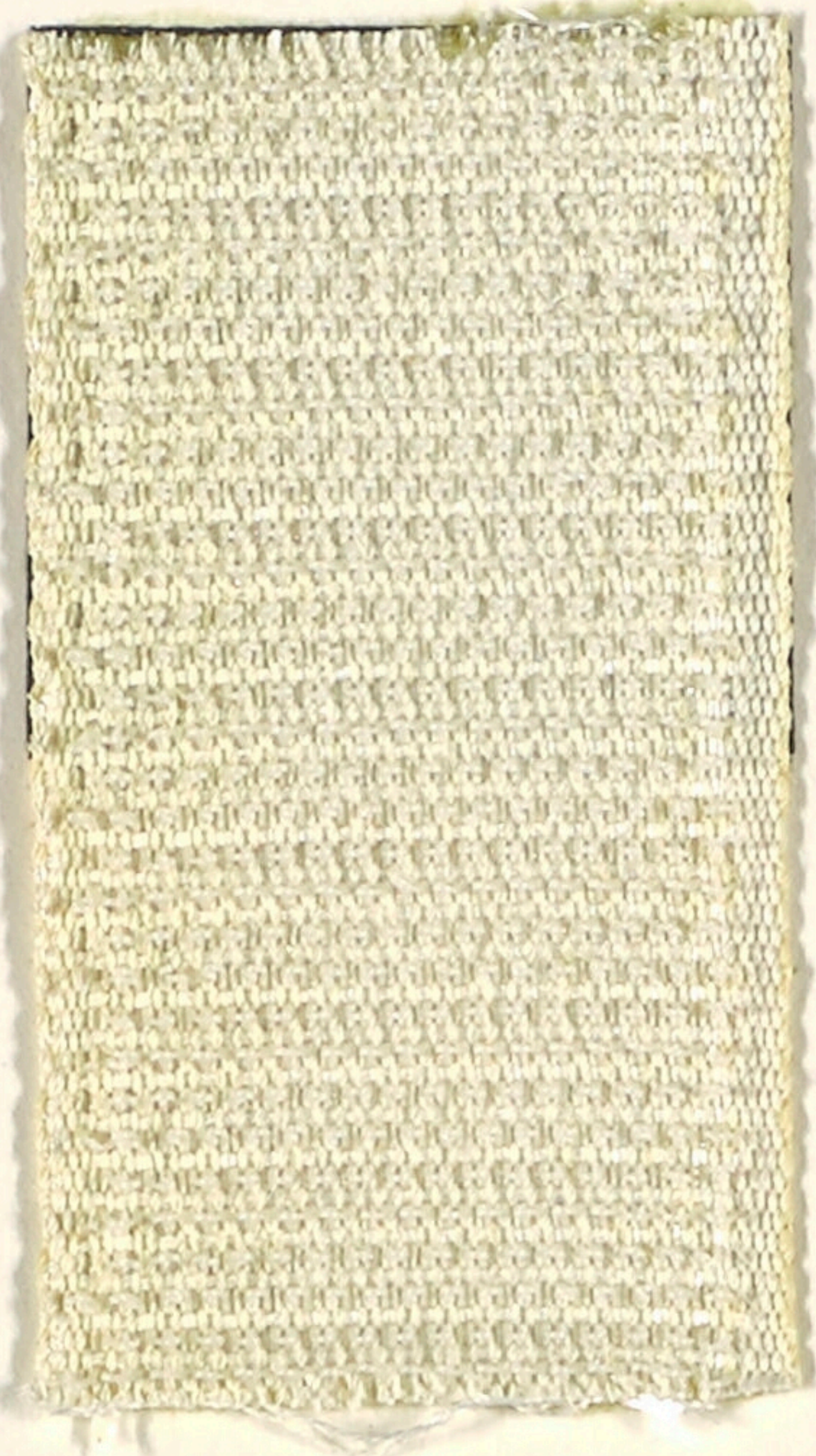




# DEDA ADDRESSES

Vi	433		V16N78 R/RDOT
HDOT	367 (360 UPDATE)		V16N92 %THROT/HDOT/H
H	337 (223 UPDATE)		V21N69 ΔRLS
Ha	315		
Hp	403	AUTO	MAN
Y	211 (-)(100Ft)	417+1	
YDOT	270,263	411+1	411+0
R	317	621 R	415+1
RDOT	440	606+R NEXT	316 E R
θ	277	-RDOT NEXT	503 E RDOT
		411+0 STOP	





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R1

VEHICLE CONFIG	QUAD A/C FOR $\ddot{x}$	QUAD B/D FOR $\ddot{x}$	ERR DEADBAND	RATE SELECT
0 = No DAP 1 = CSM 2 = CSM & LM 3 = CSM & <del>SI</del> B 6 = CSM & LM (Ascent Stg only)	0 = Fail A/C 1 = Use A/C	0 = Fail B/D 1 = Use B/D  5/10/71	0 = $\pm 0.5^\circ$ 1 = $\pm 5.0^\circ$	0 = $0.05^\circ/\text{sec}$ 1 = $0.2^\circ/\text{sec}$ 2 = $0.5^\circ/\text{sec}$ 3 = $2.0^\circ/\text{sec}$

R2

Roll Quad Select	Quad A	Quad B	Quad C	Quad D
0 = Use B/D 1 = Use A/C	0 = Fail 1 = Use	0 = Fail 1 = Use	0 = Fail 1 = Use	0 = Fail 1 = Use







# SPS BURN RULES

5/10/71

FU/OX TEMP >40 (45-75°F)  
FU/OX PRESS >115\* (170-195 psi)  
FU/OX  $\Delta P$  <20 psi  
Pc >70\* (95-105 psi)  
N2 A&B >400 (2900 psi max)

\*TIGHT:  
>160 & >80

BURN: Start watch, INJ VLVS (4) - OPEN  
He VLV tb (2) - gray, PUGS - balanced

## SPS PRESS 1t

Continue critical burn

FU/OX LO: He VLV (2) - ON, FU/OX HI: He VLV (2) - OFF

HI  $\Delta P$ : He VLV(2) - ON, If persists - OFF till Pc <70\*

## EARLY SHUTDOWN

He VLV (2) - ON  
cb PILOT VLV (2) - close ✓  
cb He VLV (2) - close ✓  
cb EPS GP 3 & 5 - close ✓  
 $\Delta V$  THRUST (2) - NORM

## NO SHUTDOWN

$\Delta V$  THRUST (2) - OFF  
THC - CW  
THRUST DIR ON - OFF  
cb PILOT VLV (2) - open  
cb EPS GP 5 - open







IV

+03 LV SEP

TIG

---

CALL

$\Delta V$

---

HOU

P

---

+24 N62 HDOT

KR N44

180-356-0

# INSERT

5/10/71

GIMBL MTRS - OFF

TVC SERVO - OFF

MN BUS TIES - OFF

PYRO ARM - SAFE

SECS LOGIC - OFF

cb SECS ARM - open

cb DIR ULL - open

cb ELS/SM SEP - open

cb PL VENT - open

$\Delta V$  THRUST - OFF

ELS - MAN

RCS LOGIC - OFF

CAB PRESS - NORM

DIRECT 02 - OFF

SM RCS HTRS - PRIM

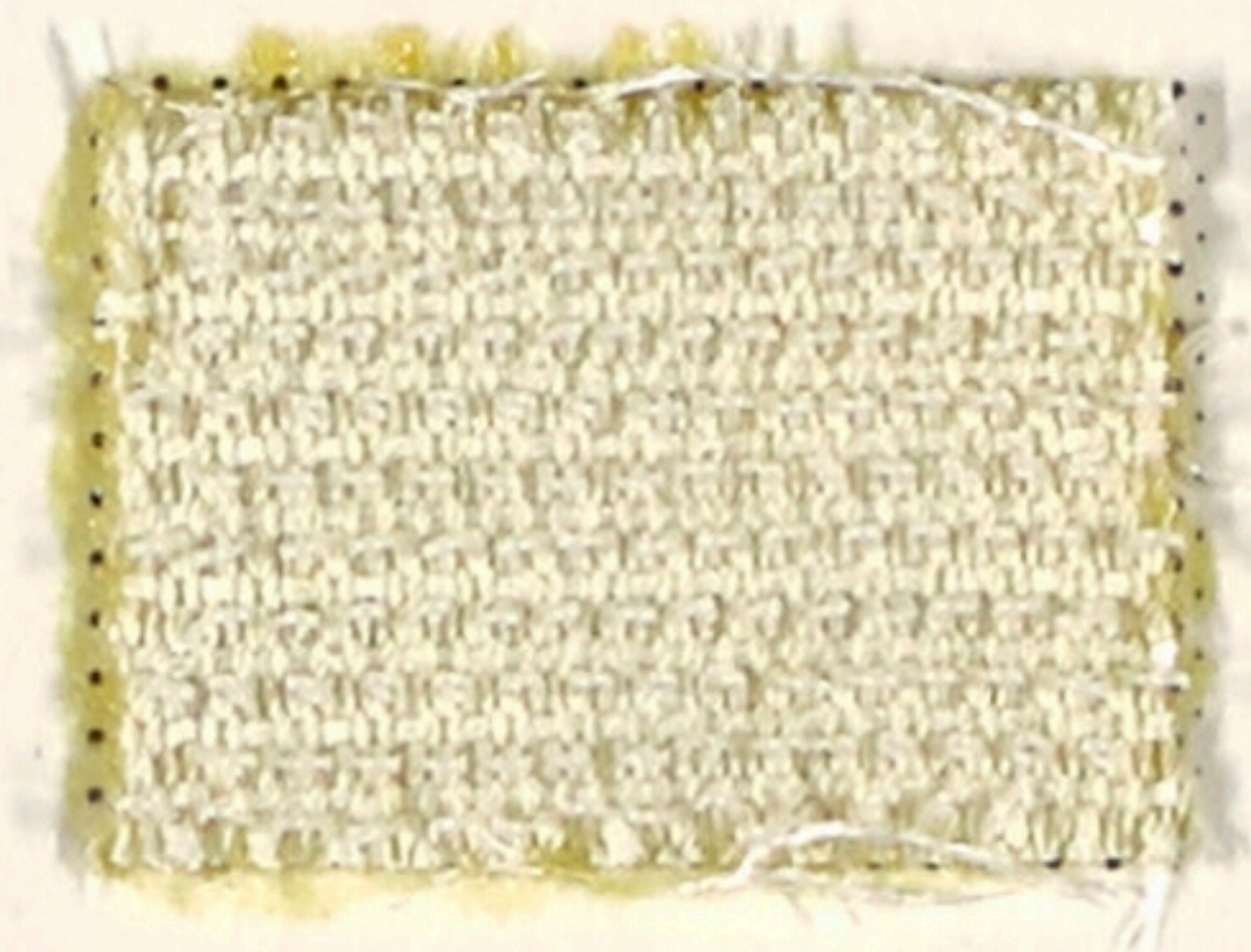
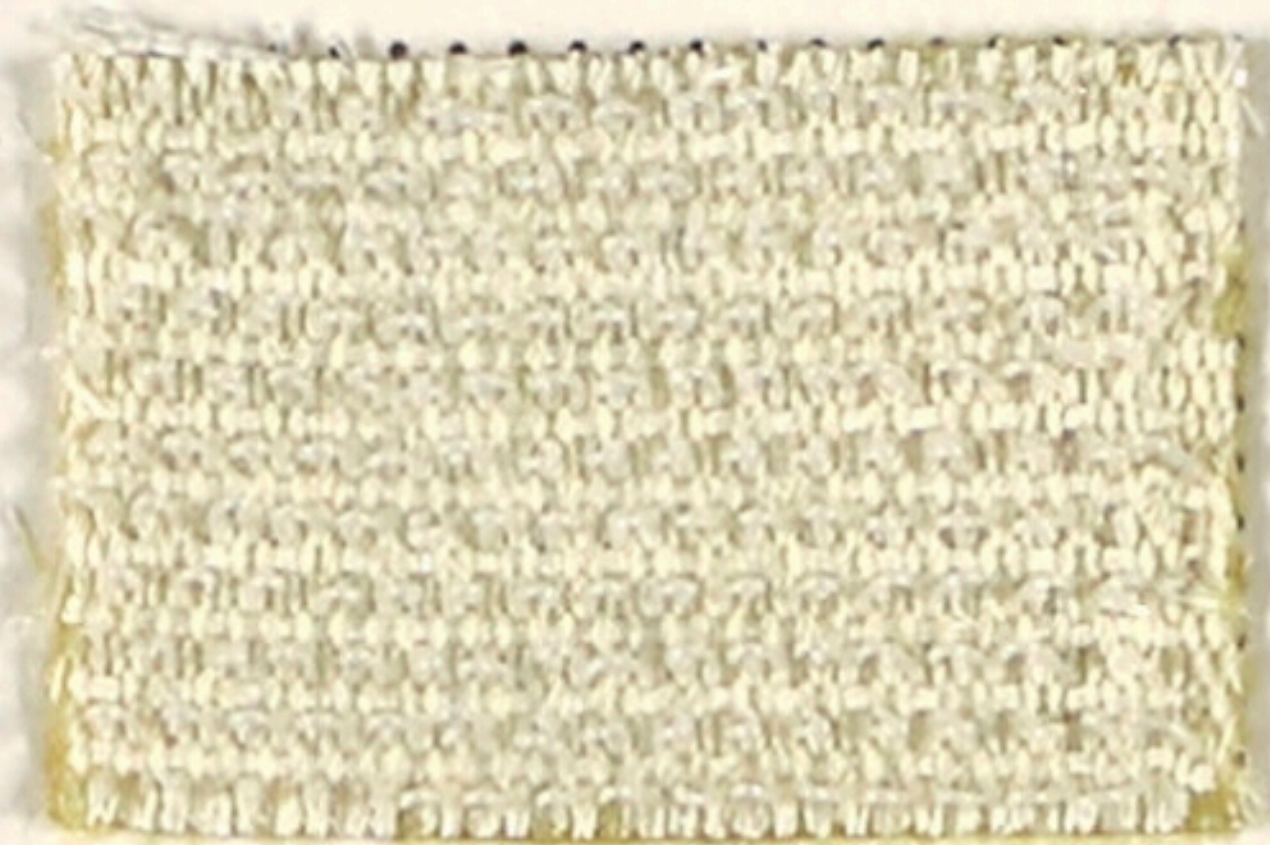
FC REACS - NORM

H2 PURGE HTR - ON

cb STM DUCT HTR - close



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10K

MAINS - DEPLOY

DIRECT 02 - OPEN ✓

CAB PRESS - CLOSE

CM RCS LOGIC - on

DUMP (He decr)

STRUTS - UNLOCK

PURGE (He zero)

3K

CAB PRESS - BOOST/ENT

cb FLT/PL A, B & C - close

cb FLT/PL MNA & B - open

CM PRPLNT - OFF

CAB PRESS - DUMP, FLOODS - PL

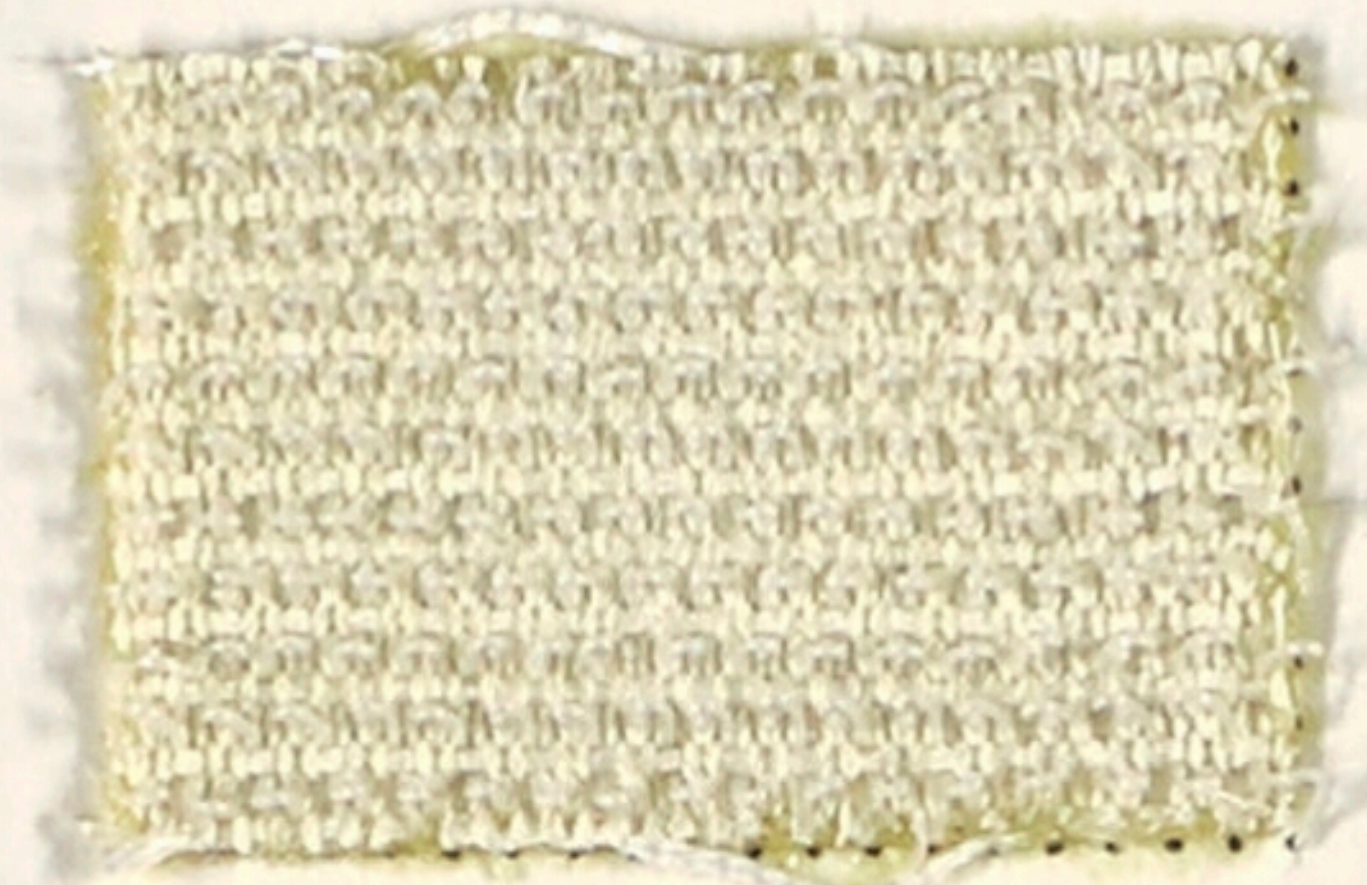
RHC PWR DIR - OFF

800

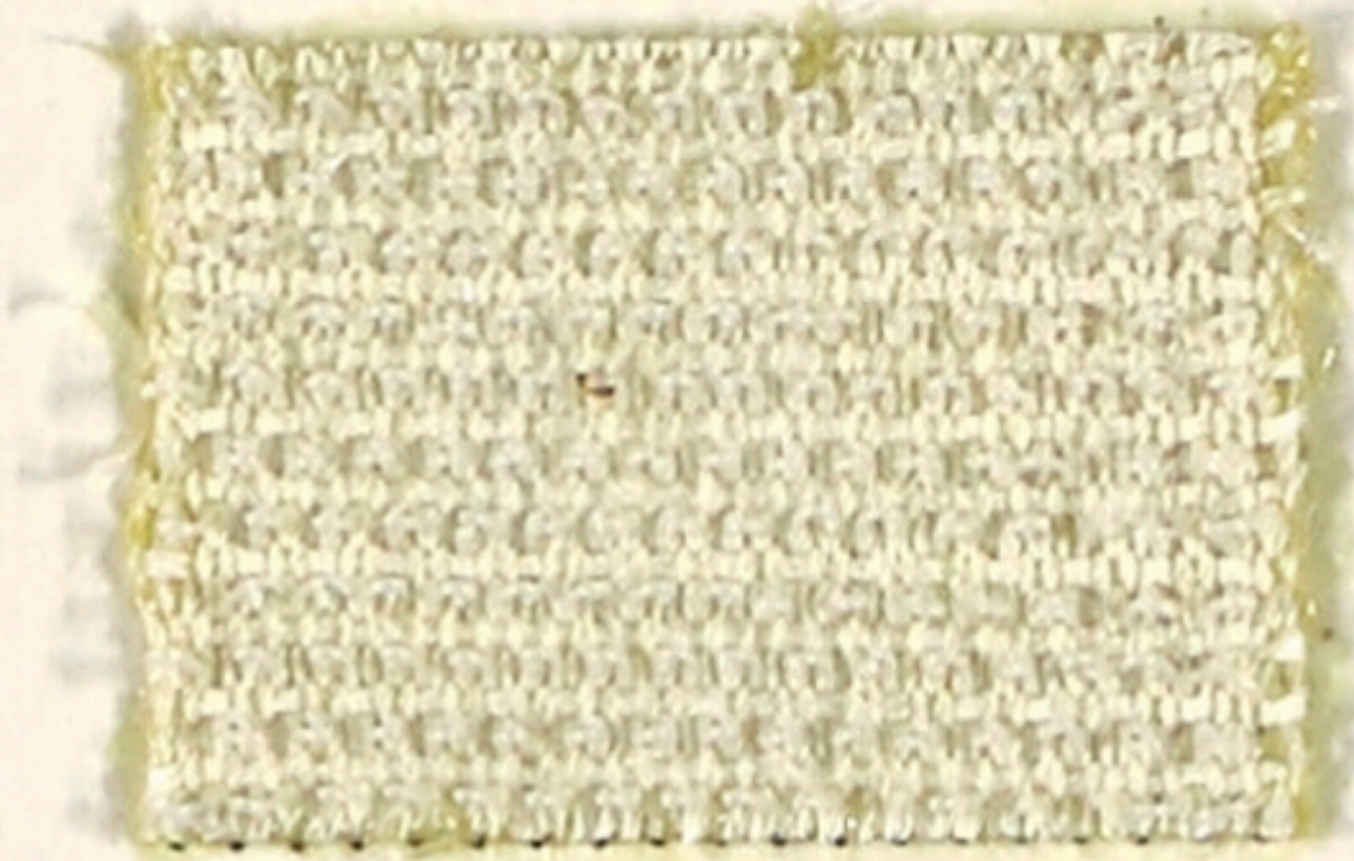
CAB PRESS - CLOSE

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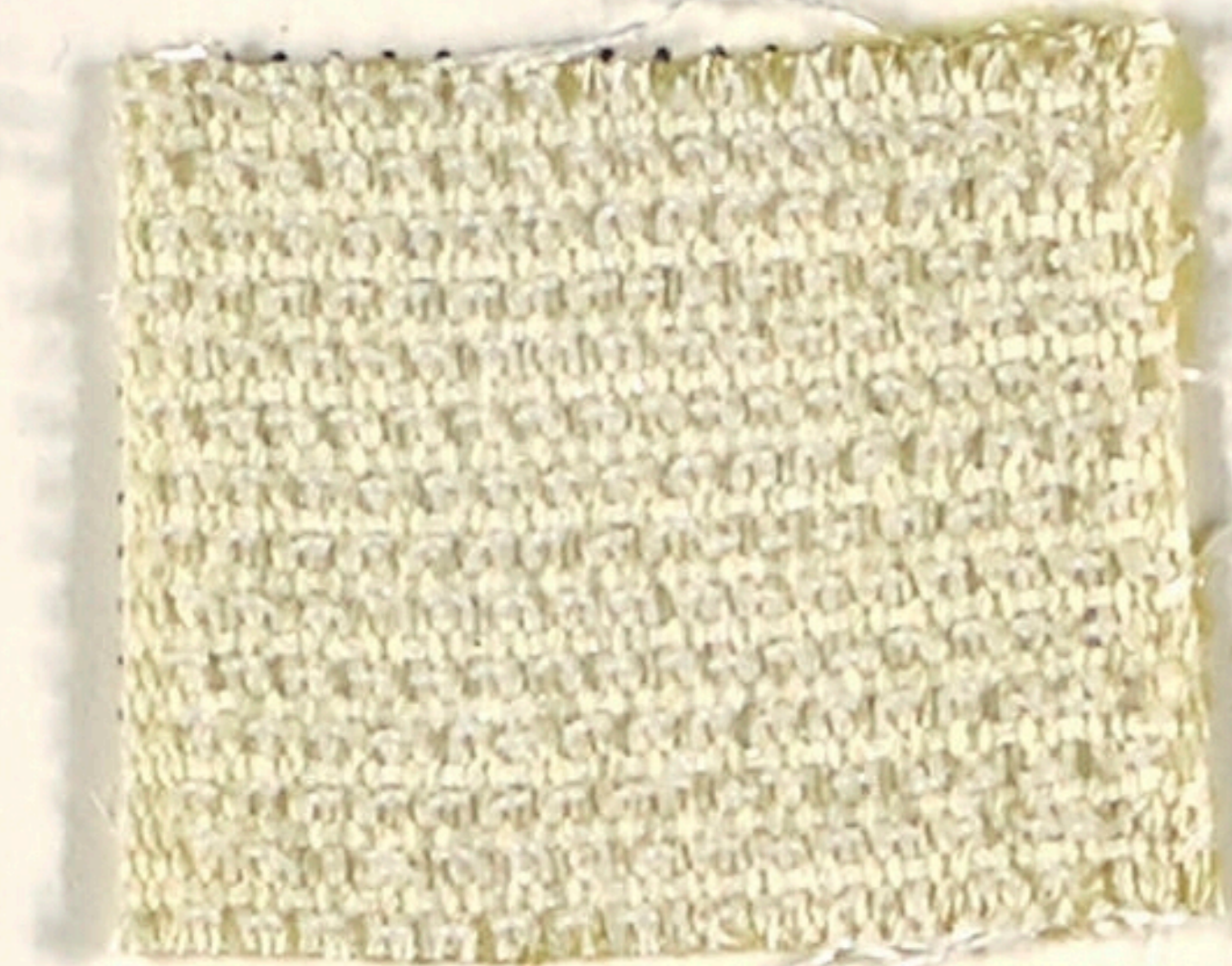
II

+03	LV SEP	LM SEP
	RCS CMD	N62 .H
+24	KR-N44 TFF	50K P21
	>2m: Y 45 L	L.AT
	SM SEP	LO.NG
	CM RCS (4)	24K APEX-
	0-120-0	DROGUES

III

			5/10/71
+03	LV SEP	TFF>2m: Y	45 L
	RCS CMD	SM SEP	
	N50 Δ.R, TFF	CM RCS (4)	
+24	180-194-0	0-105-0	LM SEP
	TIG, ΔV, P	P62 +20.30, -19.50	
2+05	SPS ON-B-ON	.2G 305-105-0	
	ΔR = 0	24K APEX-DROGUES	





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