

Photo/TV Checklist

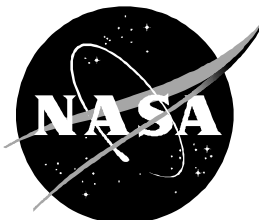
STS-109 Flight Supplement

**Mission Operations Directorate
Operations Division**

**Final, Rev A
November 30, 2001**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



United Space Alliance

Verify this is the correct version for the pending operation (training, simulation or flight).
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PHOTO/TV STS-109 Flight Suppl**FINAL, REV A (Nov 30, 2001)****PCN-1 (Jan 31, 2002) Sheet 1 of 1**

List of Implemented Change Requests (482s):

P/TV-663

P/TV-664

Incorporate the following:

1. Replace FS iii thru FS vi
2. Replace FS 1-23 & FS 1-24, FS 1-29 thru FS 1-32, FS 1-37 & FS 1-38, FS 1-47 & FS 1-48, FS 1-57 & FS 1-58, FS 1-71 thru FS 1-78, FS 1-83 thru FS 1-92, FS 1-95 & FS 1-96, FS 1-101 & FS 1-102
3. Replace FS 2-1 & FS 2-2, FS 2-27 thru FS 2-32, FS 2-35 thru FS 2-38
4. Replace FS 3-5 & FS 3-6
5. Replace FS CC 4-5 thru FS CC 4-8, FS CC 4-11 & FS CC 4-12

Prepared by: _____
Book Manager

Approved by: _____
Lead, Shuttle Photo/TV Group (USA)

Accepted by: _____
FDF Subsystem Manager (NASA)

Encl: 58 pages

File this PCN immediately behind the front cover as a permanent record

MISSION OPERATIONS DIRECTORATE

**PHOTO/TV CHECKLIST
STS-109 FLIGHT SUPPLEMENT**

FINAL, REVISION A
November 30, 2001

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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on JSC Form 482 to DO3/FDF Manager.

Additional distribution of this book for official use must be requested in writing to DO3/FDF Manager. The request must include justification and requester's name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184.

Incorporates the following:
482#: P/TV-658

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DX34/D. Williams	281-244-7882
Lead, Shuttle Photo/TV Group	DX34/D. Williams	281-244-7882

PHOTO/TV CHECKLIST
STS-109 FLIGHT SUPPLEMENT

LIST OF EFFECTIVE PAGES

FINAL	10/01/01
REV A	11/30/01
PCN-1	01/31/02

Sign Off	* 109/FIN A	FS 1-39	109/FIN A
FS ii	* 109/FIN A	FS 1-40	109/FIN A
FS iii	* 109/FIN A,1	FS 1-41	109/FIN A
FS iv	* 109/FIN A,1	FS 1-42	109/FIN A
FS v	* 109/FIN A,1	FS 1-43	109/FIN A
FS vi	* 109/FIN A	FS 1-44	109/FIN A
FS vii	* 109/FIN A	FS 1-45	109/FIN A
FS viii	* 109/FIN A	FS 1-46	109/FIN A
FS 1-1	109/FIN A	FS 1-47	109/FIN A
FS 1-2	109/FIN A	FS 1-48	109/FIN A,1
FS 1-3	109/FIN A	FS 1-49	109/FIN A
FS 1-4	109/FIN A	FS 1-50	109/FIN A
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FS 1-6	109/FIN A	FS 1-52	109/FIN A
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FS 1-8	109/FIN A	FS 1-54	109/FIN A
FS 1-9	109/FIN A	FS 1-55	109/FIN A
FS 1-10	109/FIN A	FS 1-56	109/FIN A
FS 1-11	109/FIN A	FS 1-57	109/FIN A,1
FS 1-12	109/FIN A	FS 1-58	109/FIN A,1
FS 1-13	109/FIN A	FS 1-59	109/FIN A
FS 1-14	109/FIN A	FS 1-60	109/FIN A
FS 1-15	109/FIN A	FS 1-61	109/FIN A
FS 1-16	109/FIN A	FS 1-62	109/FIN A
FS 1-17	109/FIN A	FS 1-63	109/FIN A
FS 1-18	109/FIN A	FS 1-64	109/FIN A
FS 1-19	109/FIN A	FS 1-65	109/FIN A
FS 1-20	109/FIN A	FS 1-66	109/FIN A
FS 1-21	109/FIN A	FS 1-67	109/FIN A
FS 1-22	109/FIN A	FS 1-68	109/FIN A
FS 1-23	109/FIN A	FS 1-69	109/FIN A
FS 1-24	109/FIN A,1	FS 1-70	109/FIN A
FS 1-25	109/FIN A	FS 1-71	109/FIN A
FS 1-26	109/FIN A	FS 1-72	109/FIN A,1
FS 1-27	109/FIN A	FS 1-73	109/FIN A,1
FS 1-28	109/FIN A	FS 1-74	109/FIN A
FS 1-29	109/FIN A,1	FS 1-75	109/FIN A,1
FS 1-30	109/FIN A	FS 1-76	109/FIN A,1
FS 1-31	109/FIN A	FS 1-77	109/FIN A
FS 1-32	109/FIN A,1	FS 1-78	109/FIN A,1
FS 1-33	109/FIN A	FS 1-79	109/FIN A
FS 1-34	109/FIN A	FS 1-80	109/FIN A
FS 1-35	109/FIN A	FS 1-81	109/FIN A
FS 1-36	109/FIN A	FS 1-82	109/FIN A
FS 1-37	109/FIN A	FS 1-83	109/FIN A
FS 1-38	109/FIN A,1	FS 1-84	109/FIN A,1

* - Omit from flight book

FS 1-85	109/FIN A	FS 2-33	109/FIN A
FS 1-86	109/FIN A,1	FS 2-34	109/FIN A
FS 1-87	109/FIN A,1	FS 2-35	109/FIN A,1
FS 1-88	109/FIN A,1	FS 2-36	109/FIN A,1
FS 1-89	109/FIN A,1	FS 2-37	109/FIN A
FS 1-90	109/FIN A,1	FS 2-38	109/FIN A,1
FS 1-91	109/FIN A,1	FS 3-1	109/FIN A
FS 1-92	109/FIN A,1	FS 3-2	109/FIN A
FS 1-93	109/FIN A	FS 3-3	109/FIN A
FS 1-94	109/FIN A	FS 3-4	109/FIN A
FS 1-95	109/FIN A	FS 3-5	109/FIN A,1
FS 1-96	109/FIN A,1	FS 3-6	109/FIN A
FS 1-97	109/FIN A	FS 3-7	109/FIN A
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FS 1-101	109/FIN A	FS CC 4-3	* 109/FIN A
FS 1-102	109/FIN A,1	FS CC 4-4	* 109/FIN A
FS 1-103	109/FIN A	FS CC 4-5	* 109/FIN A,1
FS 1-104	109/FIN A	FS CC 4-6	* 109/FIN A
FS 1-105	109/FIN A	FS CC 4-7	* 109/FIN A
FS 1-106	109/FIN A	FS CC 4-8	* 109/FIN A,1
FS 2-1	109/FIN A,1	FS CC 4-9	* 109/FIN A
FS 2-2	109/FIN A	FS CC 4-10	* 109/FIN A
FS 2-3	109/FIN A	FS CC 4-11	* 109/FIN A,1
FS 2-4	109/FIN A	FS CC 4-12	* 109/FIN A
FS 2-5	109/FIN A	FS CC 4-13	* 109/FIN A
FS 2-6	109/FIN A	FS CC 4-14	* 109/FIN A
FS 2-7	109/FIN A	FS 4-15 (4 pgs)	† 109/FIN A
FS 2-8	109/FIN A	FS 4-16 (4 pgs)	† 109/FIN A
FS 2-9	109/FIN A		
FS 2-10	109/FIN A		
FS 2-11	109/FIN A		
FS 2-12	109/FIN A		
FS 2-13	109/FIN A		
FS 2-14	109/FIN A		
FS 2-15	109/FIN A		
FS 2-16	109/FIN A		
FS 2-17	109/FIN A		
FS 2-18	109/FIN A		
FS 2-19	109/FIN A		
FS 2-20	109/FIN A		
FS 2-21	109/FIN A		
FS 2-22	109/FIN A		
FS 2-23	109/FIN A		
FS 2-24	109/FIN A		
FS 2-25	109/FIN A		
FS 2-26	109/FIN A		
FS 2-27	109/FIN A		
FS 2-28	109/FIN A,1		
FS 2-29	109/FIN A		
FS 2-30	109/FIN A,1		
FS 2-31	109/FIN A		
FS 2-32	109/FIN A,1		

* - Omit from flight book

† - Replace with blue K-10 card stock in flight book only

PHOTO/TV CUE CARDS

	<u>Title</u>	<u>Ref. Page</u>	<u>Card No.</u>
TV			
	(Front)	FS CC 4-3	P/TV-1a/109/O/B
	(Back)	FS CC 4-4	P/TV-1b/109/O/C
PLAYBACK			
	(Front)	FS CC 4-5	P/TV-2a/109/O/B
	(Back)	FS CC 4-6	P/TV-2b/109/O/B
ET PHOTO	(Front)	FS CC 4-7	P/TV-3a/109/O/A
	(OPTIONAL) (Back of ET PHOTO)	FS CC 4-7	P/TV-3b/109/O/C
FILM ALLOCATIONS			
	(Front)	FS CC 4-8	P/TV-4a/109/O/C
	(Back)	FS CC 4-9	P/TV-4b/109/O/A
WVS			
	(Front)	FS CC 4-10	P/TV-5a/109/O/A
	(Back)	FS CC 4-11	P/TV-5b/109/O/D
DVCAM TAPE LOG (4 copies reqd for flight)			
	(Front)	FS CC 4-12	P/TV-6a/109/O/B
	(Back)	FS CC 4-13	P/TV-6b/109/O/A
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SCENES

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P/TV01 PLB VIEWS

SCENE SYNOPSIS

Scene contains procedures for conducting PLB Camr survey of PLB and its contents for post-ascent conditions by crew(MCC) via live dnk

SETUP

1. Perform ACTIVATION,OPERATION (Cue Card, IV) as reqd

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	Inspect status of PLB,HST SSE (FSS,MULE,RAC, SAC) looking for ascent-induced damage				<u>A(B,C,D,ELB)</u>		Live (if avail)	Performed by MCC if crew time limited

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FS 1-5

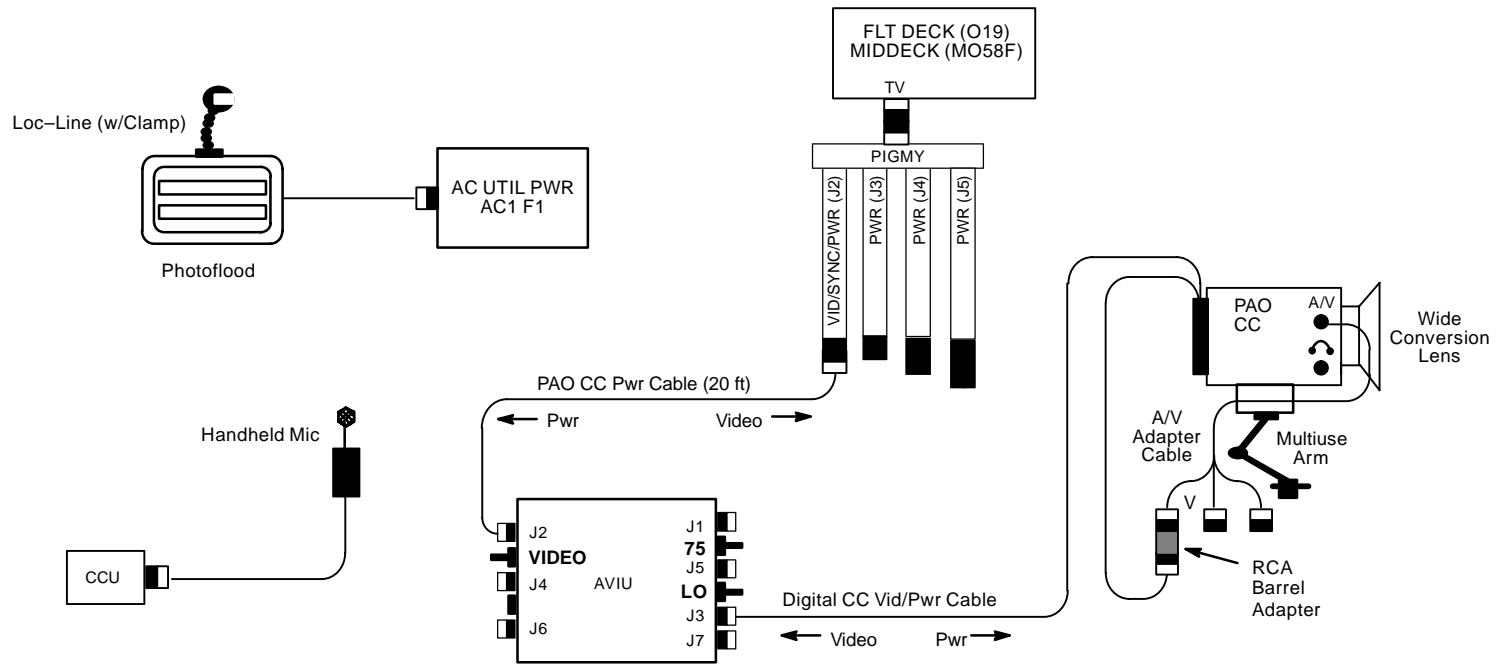
**P/TV02
IN-CABIN**

P/TV/109/FIN A

P/TV02 IN-CABIN

P/TV02 IN-CABIN ACTIVITIES

H/W SUMMARY



P/TV02 IN-CABIN ACTIVITIES (Continued)

SCENE SYNOPSIS

Scene contains procedures for obtaining in-cabin video and photos of crew, PLB, experiments, and crew during PAO events and crew conferences conducted within orbiter
For PAO events, video, audio will be recorded at MCC

QUICK CHECK

PAO CC	
O19(MO58F)	✓TV Pwr – ON
CC	Mode – CAMERA If rec to tape: Tape – Install ✓Viewfinder (LCD) displays STBY If live event: Tape – Remove ✓Viewfinder (LCD) displays blinking yellow tape Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO
F1	✓AC UTIL PWR AC1 – ON
Photoflood	ON/OFF – ON
CC	✓Scene composition, focus

SETUP

1. Perform PAO CC (SETUP DATA; PAO CC)
2. Perform F5 PROGRAM w/FLASH (SETUP DATA; 35mm NOM)
3. Perform 203 PLB EXPOSURES (SETUP DATA; 70mm NOM)
4. Perform 760 PROGRAM w/FLASH (SETUP DATA; DCS NOM)

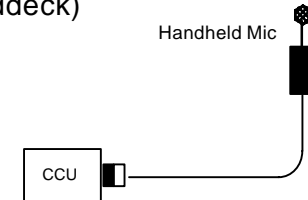
P/TV02 IN-CABIN ACTIVITIES (Continued)

SETUP (Concluded)

5. For PAO Event:
 Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd to dnk flt deck(middeck)
 Config H/W per dwg at right

ATU

PWR – AUD
 A/G 1(2) – T/R
 All Other Loops – OFF
 XMIT/ICOM MODE sel – PTT/PTT
 MSTR SPKR VOL sel – As reqd



OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	Document Crew Activities Cabin Unstow Meal Prep Eating Sleeping Hygiene Ops Physical Conditioning Camr Usage Routine Maintenance	F5 28mm ISO 100 CPos		760 50mm		PD100 Tape installed	Replay	Document various activities involving in-cabin ops Vary subject distance and point of view At least one video dnk per day excluding deorbit day
	2.	PLB Views		203 ISO 100 CPos Brkt (1 stop, 3 shot)					
	3.	Crew Photos	F5 Perform F5 CREW PHOTO (SETUP DATA: 35mm SPECIAL)		760.(Optional) Perform 760 CREW PHOTO (SETUP DATA: DCS SPECIAL)				

P/TV02 IN-CABIN ACTIVITIES (Concluded)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	4.	PAO Event Live dnlk video, audio of crewmembers					PD100 Tape removed	Live	Dnlk test pattern before, after event During dnlk, reference LCD monitor to ensure crewmembers in FOV
	5.	DSO 802					PD100		During dnlk, reference LCD Monitor to ensure crewmembers in FOV

If operations temporarily suspended, perform DEACTIVATION as reqd
If operations completed, go to DEACTIVATION

DEACTIVATION

1. 35mm F5
 - ✓ Remote Release removed
 - ✓ Exp Mode – P
 - ✓ Film Adv – S
 - ✓ Body Focus Mode – S
2. TV System
Go to DEACTIVATION (Cue Card, TV)

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**P/TV03
EARTH OBS**

P/TV03 EARTH OBS

SCENE SYNOPSIS

Scene contains procedures for photographing Earth
For non-standard ops, see 35mm SPECIAL, 70mm SPECIAL (SETUP DATA)

SETUP

1. Perform F5 SHUTTER PRIORITY w/AUTO-BRACKETING (SETUP DATA; 35mm NOM)
2. Perform 203 CVIS EARTH EXPOSURES (SETUP DATA; 70mm NOM)
3. Perform 203 CIR EARTH EXPOSURES (SETUP DATA; 70mm NOM)
4. Perform 760 SHUTTER PRIORITY w/AUTO-BRACKETING (SETUP DATA; DCS NOM)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	Earth Observation Sites	F5 400mm ISO 100 CPos	<u>203 w/CVIS</u> 250mm(350mm) ISO 100 CPos Brkt (1 stop, 3 shot) <u>203 w/CIR</u> 250mm(350mm) ISO 100 CIR Brkt (1 stop, 3 shot)	<u>760</u> 180mm(400 mm)				For upcoming sites, refer to WORLD MAP program and daily Earth Obs messages

If operations temporarily suspended, perform DEACTIVATION as reqd
If operations completed, go to DEACTIVATION

P/TV03 EARTH OBS (Concluded)

DEACTIVATION

1. 35mm F5
Exp Mode – P
Film Adv – S
Camr BKT – Disabled
Flash ON/OFF – ON

2. DCS 760
Exp Mode – P
BKT – Disable
Pwr – OFF
Flash ON/OFF – ON
Start batt recharge as reqd

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P/TV04 VIDEO CONFERENCING

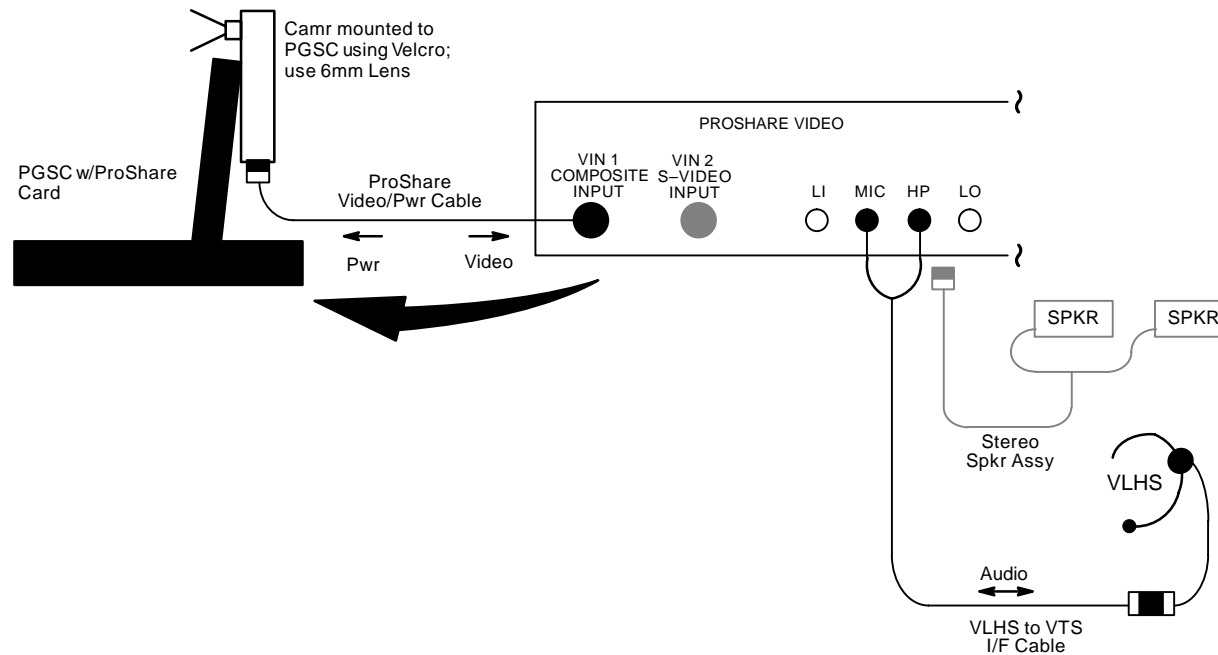
SCENE SYNOPSIS

Scene contains SETUP only for Video Conferencing

SETUP

1. Config Mini-Cam for Video Conferencing
Config H/W per dwg below

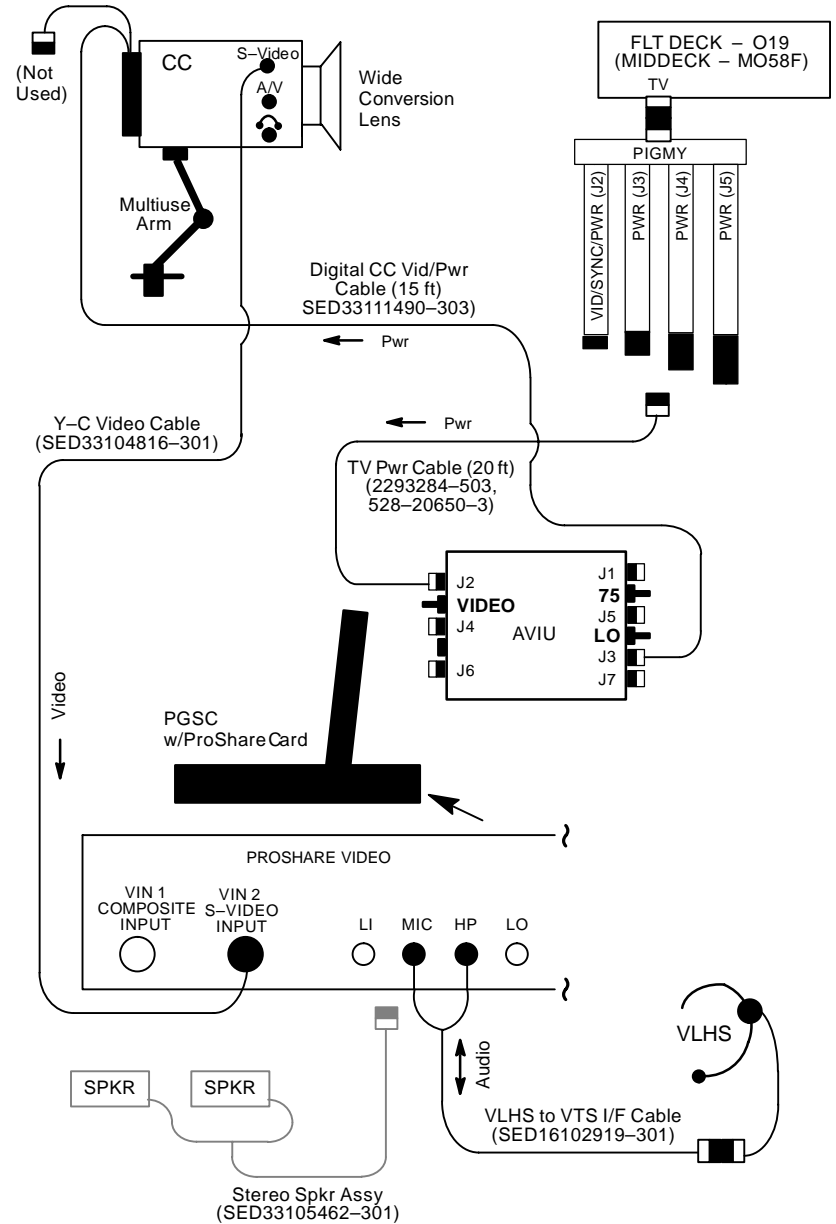
PGSC Using PGSC video display, adjust focus, aperture



P/TV04 VIDEO CONFERENCING (Concluded)

SETUP (Concluded)

- * If Mini-Cam not functioning properly:
- * Config CC for Video Conferencing:
- * Config H/W per dwg at right
- * *
- AVIU
 - * SYNC/VIDEO – VIDEO
 - * HI-Z/75 – 75
 - * PWR SELECT – LO
- * *
- O19(MO58F)
 - * ✓TV PWR – ON
- * *
- CC
 - * ✓Wide Conversion Lens installed
 - * Mode – CAMERA
 - * Tape – Remove
 - * ✓Viewfinder (LCD) displays blinking yellow tape
 - * Camr Settings
 - * ✓AUTO LOCK – AUTO LOCK
 - * FOCUS – AUTO
 - * Multiuse Brkt, Clamp
- * *
- * NOTE
- * Only one instance of the ProShare
- * application can be open at any
- * one time
- * *
- PGSC
 - * If open, exit ProShare application
 - * Double-click 'Shuttle Apps'>
 - * 'OCA ProShare'>
 - * ProShare Video with Camcorder'
 - * *
 - * To return to Mini-Cam Ops:
 - * If open, exit ProShare application
 - * Double-click 'Shuttle Apps'>
 - * 'Proshare Video'



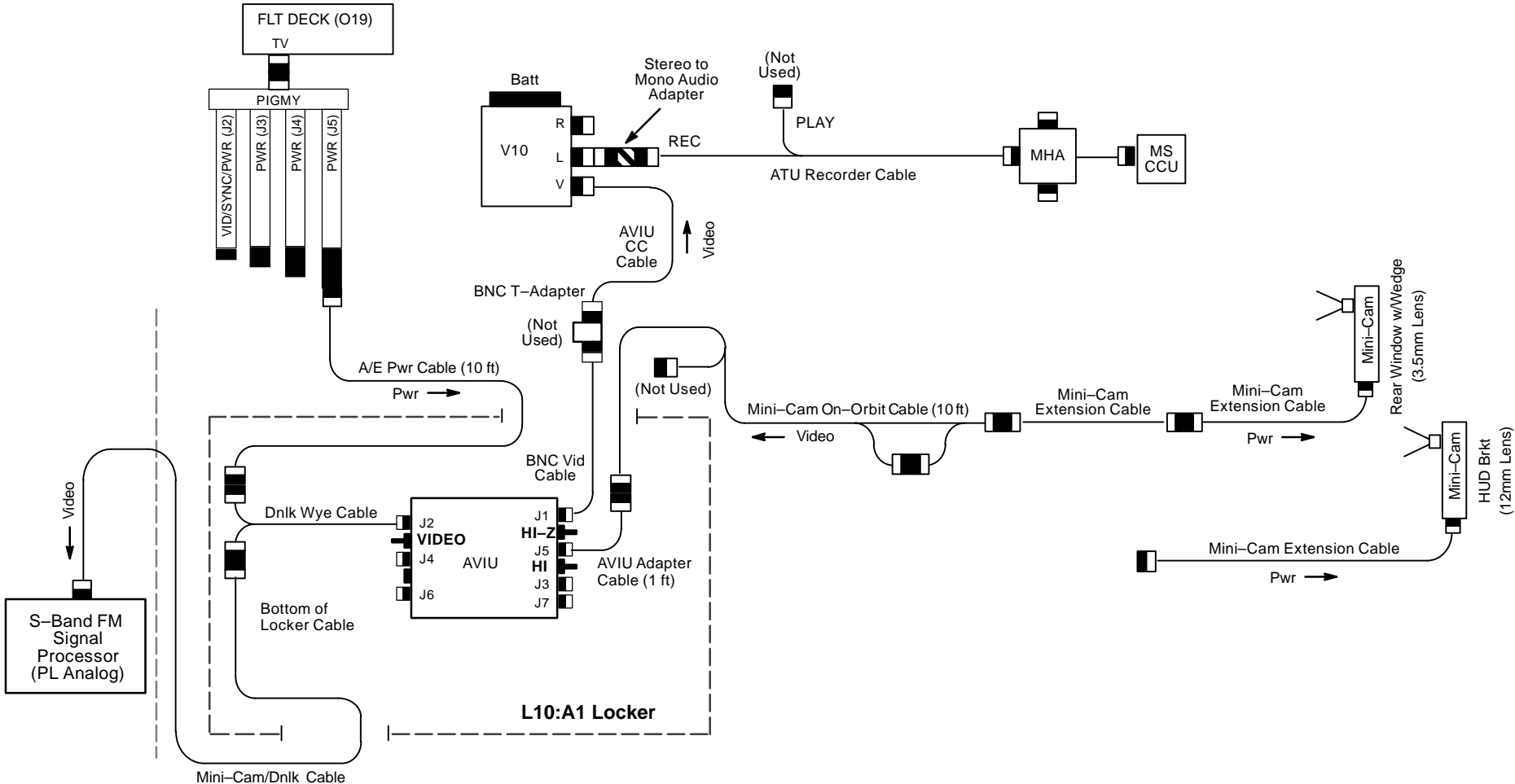
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P/TV05 ENTRY VIDEO

H/W SUMMARY

ENTRY VIDEO SETUP
HUD Mini-Cam DNLK via FM Signal Processor



P/TV05 ENTRY VIDEO (Continued)

SCENE SYNOPSIS

Scene contains SETUP only for Mini-Cam use during entry

SETUP

1. Config Mini-Cam, V10 for Audio, Video Recording
Config H/W per dwg, FS 1-20

HUD
Brkt/Cam

Using two (2) captive screws, attach HUD Brkt to installation holes for protective cover w/ HUD Brkt tab pointing up
Attach Tie Wrap thru holes on captive screws to prevent screw from coming loose; cut off extra length on Tie Wrap
Attach Mini-Cam Extension Cable to Mini-Cam
Velcro Mini-Cam w/12mm lens to HUD Brkt. (Top of black Velcro on front of Camr should be at top edge of HUD Brkt. Only yellow Velcro should be visible above HUD Brkt)

Rear Window
Brkt/Cam

Attach Mini-Cam Extension Cable to Mini-Cam w/3.5mm Lens
Velcro Mini-Cam w/3.5mm Lens to rear window brkt w/wedge

12mm Lens

Focus – ∞
Aperture – f/5.6

3.5mm Lens

Aperture – f/1.8

L10:A1

AVIU
SYNC/VIDEO – VIDEO
HI-Z/75 – HI-Z
PWR SELECT – HI

O19

✓TV PWR – ON

MS ATU

Config audio as reqd for entry audio

P/TV05 ENTRY VIDEO (Concluded)

SETUP (Concluded)

V10 Install fresh batt
 PWR – ON
 Display pb – Press
 Install fresh tape

✓12mm Lens/Mini-Cam producing good video

 Change config to 3.5mm Lens/Mini-Cam
✓3.5mm Lens/Mini-Cam producing good video

O19 TV PWR – OFF

V10 PWR – OFF

NOTE

TV,V10 pwr will be re-enabled at EI-7 min via ENTRY C/L

Start w/3.5mm Lens/Mini-Cam video in-cabin and reconfig for 12mm Lens/Mini-Cam when exterior scene available

When exterior avail:

 Install fresh batt,tape
 Focus – Adjust per V10 Mon
 Aperture – Adjust per V10 Mon
 If needed, turn down brightness on HUD display

Close V10 LCD when not needed

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P/TV06 SEQUENTIAL STILL VIDEO (SSV)

SCENE SYNOPSIS

Scene provides crew procedures for dnlk of Sequential Still Video (SSV)

SETUP

1. Config SSV H/W to PDIP
Config H/W per dwg at right

NOTE

Video Spare 1 controlled by MCC instead of pnl A7

L12
(SSP 1)
L12
(PDIP)

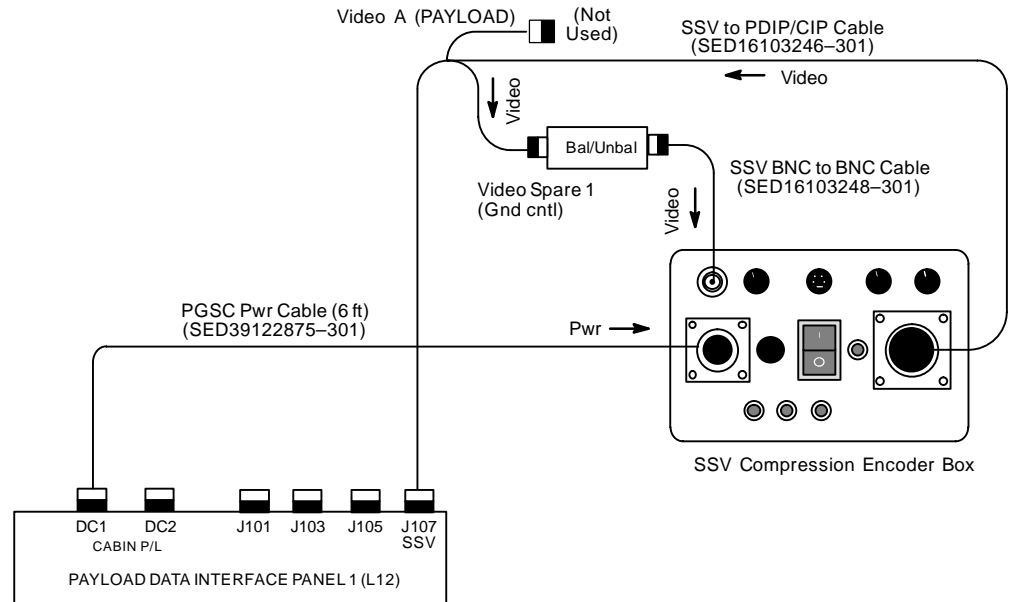
- ✓cb PDIP PWR 1 (CB3) – cl
- DC PWR 1 CAB PL – ON

SSV

2. Config SSV settings
IN SEL – NTSC
Mode – 3 (may change if desired)
OUTRATE – 3
SSV Pwr – on
✓Pwr LED illum
✓ENC DATA LED flickering
✓FRM DATA LED flickering
✓FILL FRM pulsing

3. Inform MCC when SSV SETUP complete

CCTV SYSTEM DNLC



P/TV06 SEQUENTIAL STILL VIDEO (SSV) (Concluded)

DEACTIVATION

- L12
(PDIP)
1. SSV
SSV Pwr – off
 - ✓Pwr LED not illuminated
 - ✓ENC DATA LED not illuminated
 - ✓FRM DATA LED not illuminated
 - ✓FILL FRM LED not illuminatedDC PWR 1 CAB PL – OFF
 2. TV System
Perform DEACTIVATION (Cue Card, TV)

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P/TV07 EVA CAMR SETUP

SCENE SYNOPSIS

Scene contains EVA Still Camr setup and WVS setup for C/O
WVS PGSC application setup for EVA ops contained in P/TV15

EVA STILL CAMR (F5) (2 units)

1. Unstow H/W and assemble:
 - Lens – EVA 28mm(EVA 35mm)
 - Film ISO 100 CPos
 - EVA Finder
 - AA Fresh Batts (8) for Camr Body

Unstow, but do not install:

 - Thermal Cover
 - EVA Camr Mount
2. Camr Settings:
 - Pwr – ON
 - ✓Batt icon full
 - ✓Frame Counter ≥ 1
 - Exp Comp – 0.0
 - Exp Mode – P
 - AF Area Mode – []
 - Meter – Matrix
 - Film Adv – S
 - Body Focus Mode – S
 - Aperture – Min, Locked
 - ✓ISO – DX
 - ✓Camr BKT – Disabled
 - Focus Area – Center, LOCK displayed
 - ✓Custom Setting – 12-1, E35
 - ✓Vert Shooting Shutter Rel – Lock (L to white line)

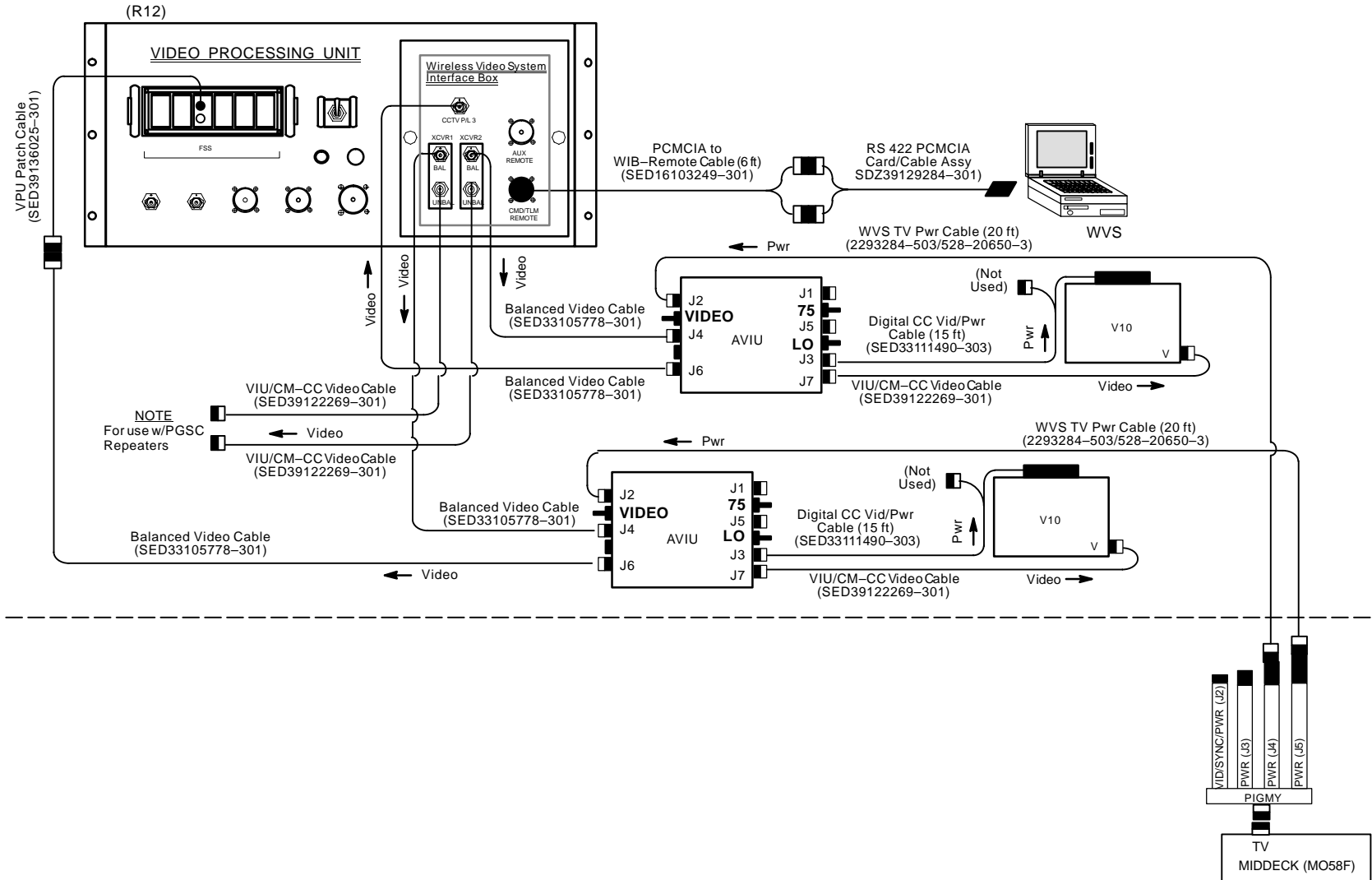
Data Back Settings:

 - ✓Between Frame – YR MO/DY HH:MM:SS
 - Between Frame Data – PRINT displayed
3. Final Assembly and Test Fire:
 - ✓All cntl pnl covers closed
 - ✓Exp Mode – P (no *)
 - Thermal Cover – Install
 - Test fire Camr
 - EVA Camr Mount – Install
 - Temp stow Camr until airlock config for EVA

P/TV07 EVA CAMR SETUP (Continued)

WIRELESS VIDEO SYSTEM (WVS)

1. Unstow and set up IV H/W per diagram



P/TV07 EVA CAMR SETUP (Continued)

WIRELESS VIDEO SYSTEM (WVS) (Continued)

2. Photo/TV Preparations

TV System

Airlock Perform ACTIVATION (Cue Card, TV)
Lights – ON

AVIUs Powering V10s (two)

SYNC/VIDEO – VIDEO
HI-Z/75 – 75
PWR/SELECT – LO

V10 (two)

MO58F ✓TV Pwr – ON
V10 POWER – ON
DISPLAY pb – Press to display tape counter
✓Tape installed

3. WVS H/W Prep

A7 ✓WIRELESS VIDEO HEATER – ON
POWER – ON

EMU ✓EMU TV installed on helmet
PLSS REBA sw – ON
EMU EMU TV Pwr pb – Press (Green LED)

P/TV07 EVA CAMR SETUP (Continued)

WIRELESS VIDEO SYSTEM (WVS) (Continued)

4. WVS PGSC Prep

A11
PGSC

PGSC Pwrup and Application Opening

✓DC UTIL PWR MNC – ON

Pwr – ON

Sel appropriate Expansion Unit config at Startup Menu, then press [Enter]

Sel SHUTTLE APPS icon

Sel WVS icon

Sel 'NO' at 'RESTORE TO PREVIOUS SETTINGS' window

RF Camera page will appear

Application Setup

Select Page – XCVR

Transceiver 1(2) CMD Power – ON (green CMD PWR:LVL– “ON:Min”)

Sel RF Camera 1 – One EVA crewmember (green “ON”)

Sel RF Camera 2 – Other EVA crewmember (green “ON”)

If crewmember designations not in pulldown menu:

✓RF Camera 1,2 – None

Perform CAMERA ID ASSIGNMENT (Cue Card, WVS), then:

Reattempt RF Camr selections

If alert msg, perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)

Sel File → Advanced Controls

On XCVR tab:

Sel IF

✓Other options not selected

On RF Camera tab:

Sel Power Selections

Sel Automatic Gain Control

Sel S-Band Level

✓Other options not selected

When complete, sel OK

Sel Miscellaneous → Local Diversity (check mark)

P/TV07 EVA CAMR SETUP (Continued)

WIRELESS VIDEO SYSTEM (WVS) (Continued)

4. WVS PGSC Prep (Concluded)

Verification of Initial Parameters

Under Transceiver 1,2, ✓Antenna (both) – Auto

Near middle of page, sel Advanced Controls icon (✓Advanced Controls appear at bottom)

✓IF (both) – Wide

Select Page – RF Camera

For C,L,R lens on each RF Camr Assy:

✓Electronic Shutter – Auto

✓White Balance Control – Auto

Under Advanced Controls, ✓Automatic Gain Control – Disabled

Under Advanced Controls,

✓Power (both) – ON

✓S-Band Level (both) – Dynamic

5. WVS Checkout

Video Quality Check

V10
PGSC

REC pb (two) – Press (Red LED)

For C,L,R lens on each RF Camr Assy:

Lens Iris Control – Open

✓Video quality and perform CAMR ADJUSTMENTS (Cue Card, WVS) as desired

Video Routing Check

A7

VID OUT pb – MON 1

IN pb – WVS1

OUT pb – MON 2

IN pb – WVS2

MON 1,2

✓Video quality

P/TV07 EVA CAMR SETUP (Concluded)

WIRELESS VIDEO SYSTEM (WVS) (Concluded)

5. WVS Checkout (Concluded)

XCVR Frequency Swap Check

- V10
PGSC
- Sel Frequency icon (either RF Camr)
 - ✓Video swap on V10s
 - ✓Crewmember designations and RF Camr frequencies for each XCVR swapped
 - ✓Crewmember designations above each RF Camr Assy column swapped
 - Sel Frequency icon (either RF Camr)

EMU TV Frequency Swap Check

- PGSC
V10
PGSC
- Sel opposite crewmember on XCVRs via one RF Camr pulldown menu
 - ✓Video swap on V10s
 - ✓Frequency for each XCVR same as before
 - ✓Crewmember designations for each XCVR swapped, but RF Camr frequencies unchanged
 - ✓Crewmember designations above each RF Camr Assy column swapped
 - Reassign original crewmembers to XCVRs via one RF Camr pulldown menu

6. Pwr dn

- PGSC
EMU
PLSS
- Perform PWRDN (Cue Card, WVS)
 - EMU TV Pwr pb – Press (no Green LED)
 - REBA sw – OFF

TV System

- Go to DEACTIVATION (Cue Card, TV) as reqd

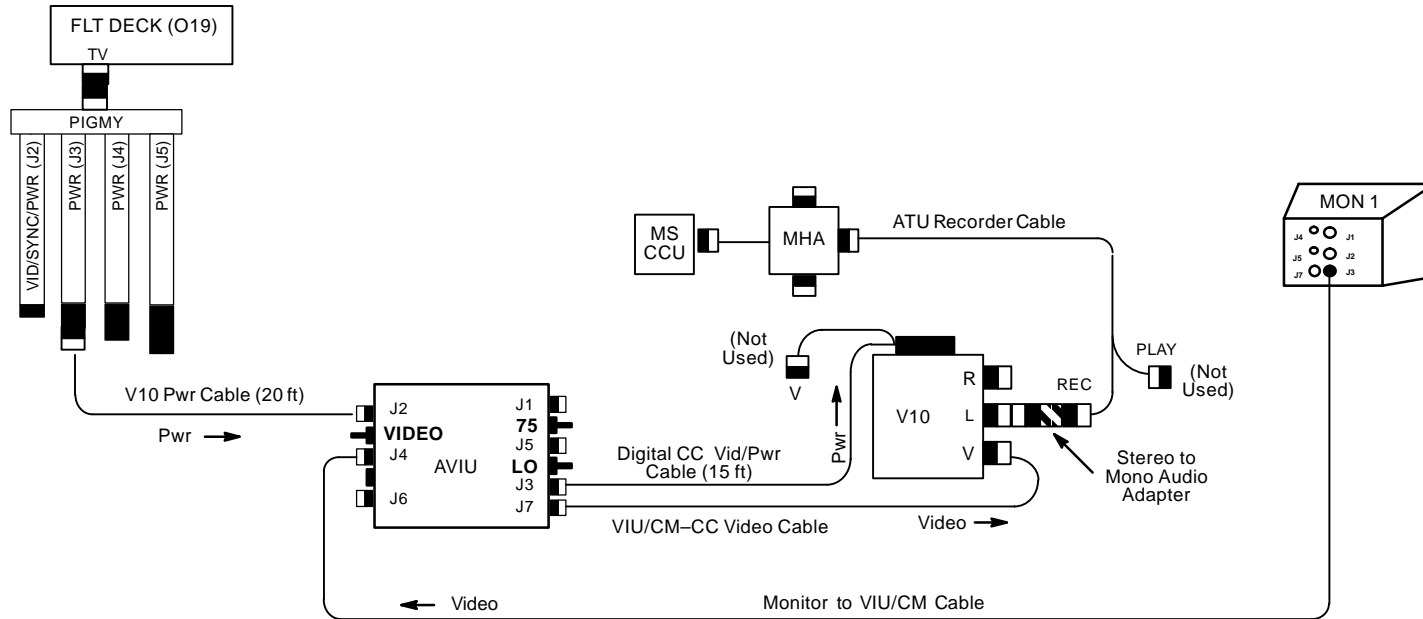
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P/TV10 SSE SURVEY

P/TV10 SSE SURVEY

H/W SUMMARY



P/TV10 SSE SURVEY (Continued)

SCENE SYNOPSIS

Scene contains procedures for recording survey of HST SSE components after on-orbit arrival

QUICK CHECK

V10	
O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape count

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
3. Perform F5 SHUTTER PRIORITY (SETUP DATA; 35mm NOM)

P/TV10 SSE SURVEY (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<p>SSE VIDEO SURVEY</p> <ul style="list-style-type: none"> ● MULE <ul style="list-style-type: none"> a. Avionics b. NCS Radiators c. ESM ● FSS <ul style="list-style-type: none"> a. BAPS, Latches b. Main Umbilical c. BSP d. LGA Cover e. PFR ● SAC <ul style="list-style-type: none"> a. Aft Fixture b. NCC c. WFPC Thermal Cover d. FHST Covers e. ASIPE, Latches, PFR f. Mini-TA g. PCU, Handhold, HRD h. FWDSAC PFR ● RAC <ul style="list-style-type: none"> a. Stbd ATM b. Stbd SADA Clamp c. Stbd DBA d. MLI Tent e. Stbd Aft Latch f. Stbd Fwd Latch g. Stbd Fwd Constraint h. Fwd PFR i. SA Ills, Latches, Pnl Constraints j. Aft PFR k. Port ATM l. Port SADA Clamp m. Port Diode Boxes n. Port Aft Latch o. Jettison Handle p. Port Fwd Latch q. Port Fwd Constraint r. Port Fuse Caddy 				<p><u>B.C</u></p> <p><u>A,B,C.Wrist, Elbow</u></p> <p><u>Wrist,Elbow</u></p> <p><u>A,D.Wrist,Elbow</u></p>		Desired	PLBK requested prior to crew sleep if dnlk not avail

P/TV10 SSE SURVEY (Concluded)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	2.	SSE STILL IMAGE SURVEY <ul style="list-style-type: none"> • FSS <ul style="list-style-type: none"> a. BAPS, Latches b. Umbilical c. Rotator d. Downlock e. Pivoter Targets • SAC <ul style="list-style-type: none"> – ASIPE • RAC <ul style="list-style-type: none"> a. SA IIIs b. Diode Boxes 	F5 80–200mm (400mm) ISO 100 CPos						

If operations temporarily suspended, perform DEACTIVATION as reqd
 If operations completed, go to DEACTIVATION

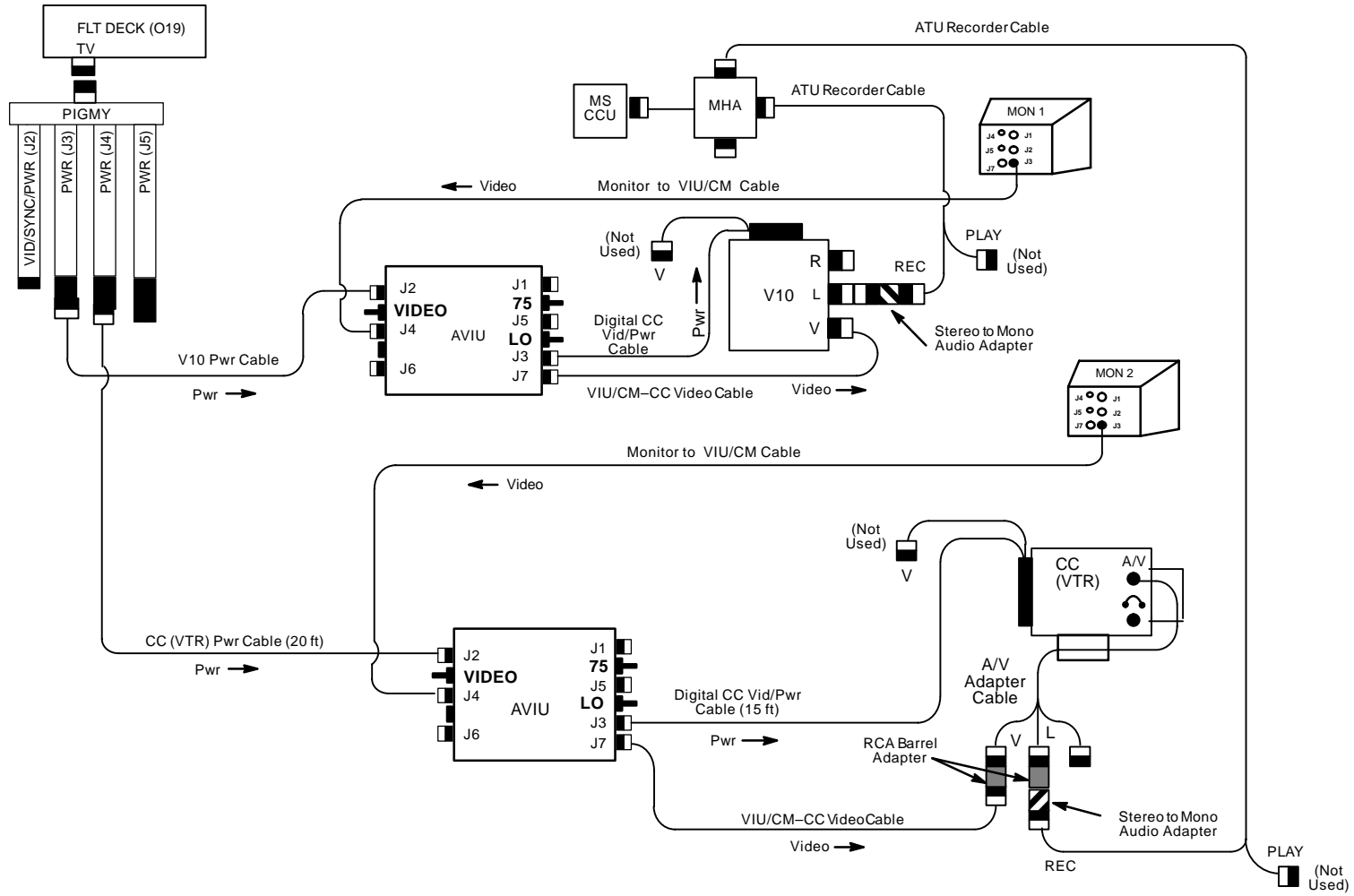
DEACTIVATION

1. 35mm F5
 Exp Mode – P
 Flash ON/OFF – ON
2. TV System
 Go to DEACTIVATION (Cue Card, TV) as reqd

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H/W SUMMARY



P/TV11 FSS OPS (Continued)

SCENE SYNOPSIS

Scene contains procedures for recording FSS movements w/ and w/o HST attached

QUICK CHECK

V10		CC (VTR)	
O19	✓TV Pwr – ON	O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape count	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape count

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC (VTR))
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform F5 SHUTTER PRIORITY (SETUP DATA; 35mm NOM)

P/TV11 FSS OPS (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<u>FSS CONFIG FOR BERTHING</u> <ul style="list-style-type: none"> ● Video FSS Downlock mechanism retraction/release ● Video BAPS pivot from 0–90° including pivoter targets w/emphasis on final config ● Video BAPS rotator target after PIVOT OPS complete ● Video of each Berthing Latch (three) to ensure fully open ● Video of main umbilical movement during cycling, watching for obstructions ● Video of backup umbilical mechanism showing unobstructed, retracted connector ● Still Images in Final Config: <ol style="list-style-type: none"> a. Downlock b. Pivot target c. Rotator target d. Latches (three) e. Main umbilical 				<u>D</u> <u>A.B</u> <u>C.D</u> <u>A.D</u> <u>WRIST</u> <u>WRIST</u>			

P/TV11 FSS OPS (Concluded)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	2.	<u>FSS/HST REPOSITIONING</u> <ul style="list-style-type: none"> Video of FSS/HST pivots, rotations watching pivot, rotation targets and watching for SA clearance of orbiter structure 				<u>B(D).ELBOW</u>			B(D) – FSS targets ELBOW – Wide view
	3.	<u>FSS CONFIG FOR LANDING</u> <ul style="list-style-type: none"> Video of BAPS pivot from 90° to 43.8° Closeup video of BSP latching mechanism engagement Wide view video of BAPS in final config 				<u>A.B</u> <u>B.C</u> <u>A.C</u>			

If operations temporarily suspended, perform DEACTIVATION as reqd
 If operations completed, go to DEACTIVATION

DEACTIVATION

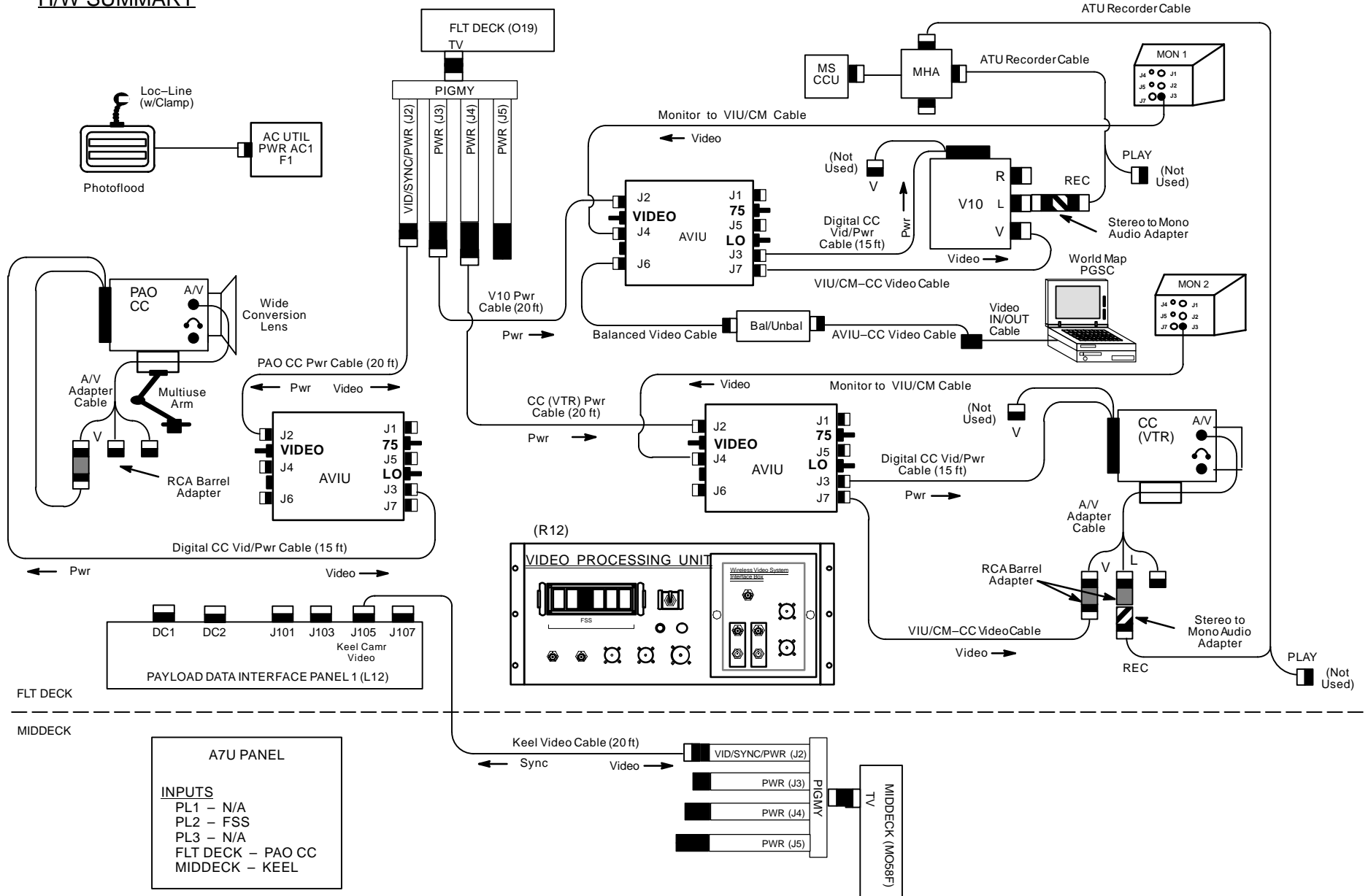
1. 35mm F5
Exp Mode – P
Flash ON/OFF – ON
2. TV System
Go to DEACTIVATION (Cue Card, TV) as reqd

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P/TV12 HST RETRIEVE/BERTH

H/W SUMMARY



P/TV12 HST RETRIEVE/BERTH (Continued)

SCENE SYNOPSIS

Scene contains procedures for obtaining video, still photos of HST retrieve, berth

QUICK CHECK

V10		CC (VTR)		PAO CC	
O19	✓TV Pwr – ON	O19	✓TV Pwr – ON	O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – CAMERA ✓Tape installed ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK FOCUS – AUTO
				F1	✓AC UTIL PWR AC1 – ON
				Photoflood	ON/OFF – ON
				CC	✓Scene composition, focus
Keel Camr		FSS Camr			
MO58F	✓Keel Video Cable connected to Pigmy J2/Vid/Sync/Pwr	R12U (VPU)	✓Green Jumper – FSS ✓VPU PWR – ON (LED on)		
	✓TV Pwr – ON	L12 (SSP 1)	✓CCTV HTR PWR – ON (tb-gray) SM 211 SSE CONTROL		
L11 (SSP 3)	KEEL CAM ENA – ON		✓CCTV ENA ON – ITEM 3 (*) ✓PWR ON – ITEM 5 (*)		

P/TV12 HST RETRIEVE/BERTH (Continued)

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC(VTR))
3. Perform PAO CC (SETUP DATA; PAO CC)
4. Perform KEEL CAMR (SETUP DATA; KEEL CAMR)

R12
(VPU)

5. FSS Camr
Green Jumper – FSS
✓VPU Pwr – ON (LED on)

L12
(SSP 1)

- ✓CCTV HTR PWR – ON (tb-gray)

NOTE

FSS Camr activation performed in HST
BERTH (PDRS OPS FS, HST BERTH)

6. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
7. Perform F5 SHUTTER PRIORITY (SETUP DATA; 35mm NOM)
8. Perform 203 PLB EXPOSURES (SETUP DATA; 70mm NOM)
9. Perform 760 SHUTTER PRIORITY (SETUP DATA; DCS NOM)

|

P/TV12 HST RETRIEVE/BERTH (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<u>HST ORBITER APPROACH,GRAPPLE</u> <ul style="list-style-type: none"> • Video of HST approach,grapple viewing HGAs,AD, SAs to ensure in retrieve config • Still images of HST for overall config, especially aft bulkhead 	<u>F5</u> 28-70mm ISO 100 CPos	<u>203</u> 250mm (110mm) ISO 100 CPos	<u>760</u> 400mm (80-200mm) Survey rqmts	<u>A(D).KEEL</u> <u>WRIST</u>	<u>PD100</u> In-Cabin Activities Tape installed	LIVE (PLBK)	Replay video if no comm Dnlk DCS images prior to crew sleep
	2.	<u>HST POST-GRAPPLE MNVR</u> <ul style="list-style-type: none"> • Video of RMS mnvr of HST to berth posn w/emphasis on aft bulkhead components • Video of -V2 SA wing tip, berthing latch envelope simo • Still images of aft bulkhead while overhead 	<u>F5</u> 28-70mm ISO 100 CPos		<u>760</u> 80-200mm Survey rqmts	<u>D.B.FSS</u>	<u>PD100</u> In-Cabin, Ovhd Window View Tape installed	LIVE (PLBK)	Replay video if no comm Dnlk DCS images overnight
	3.	<u>HST BERTH,LATCHING</u> <ul style="list-style-type: none"> • Video of each latch operation • Video of -V2 SA wing tip during latching ops • Still images of each latch in final config 	<u>F5</u> 400mm ISO 100 CPos			<u>B(C)</u> <u>D</u>			

P/TV12 HST RETRIEVE/BERTH (Concluded)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	4.	<u>HST/FSS UMBILICAL MATE</u> <ul style="list-style-type: none"> • Video of umbilical travel, mating ops • Still image of final config 	<u>F5</u> 400mm ISO 100 CPos			<u>A.B</u>			
	5.	<u>RMS RELEASE</u> <ul style="list-style-type: none"> • Video of RMS EE release,backaway 				<u>WRIST.D</u>			

If operations temporarily suspended, perform DEACTIVATION as reqd
 If operations completed, go to DEACTIVATION

DEACTIVATION

1. DCS 760
 Exp Mode – P
 Pwr – OFF
 Flash ON/OFF – ON
 Start batt recharge as reqd
2. 35mm F5
 Exp Mode – P
 Flash ON/OFF – ON
3. TV System
 KEEL CAM ENA – OFF

L11
 (SSP 3)

NOTE

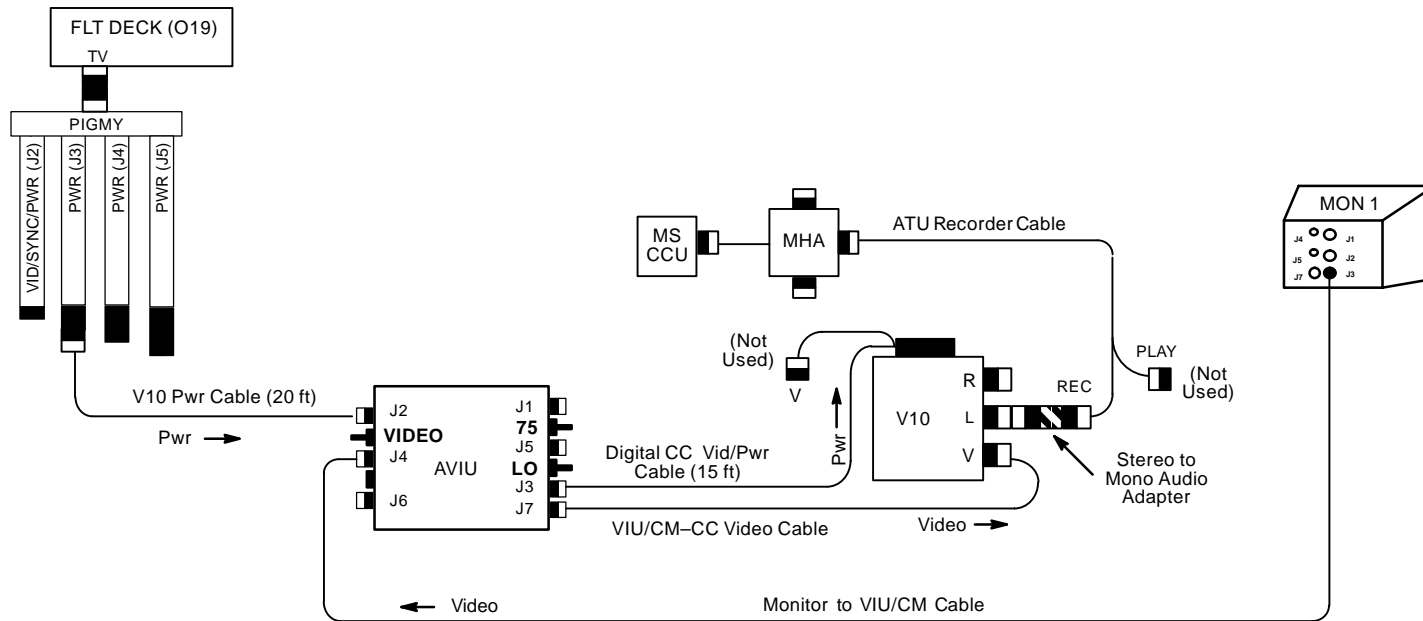
FSS Camr deactivation performed in HST BERTH (PDRS OPS FS, HST BERTH)

Go to DEACTIVATION (Cue Card, TV) as reqd

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P/TV13 HST SURVEY

H/W SUMMARY



P/TV13 HST SURVEY (Continued)

SCENE SYNOPSIS

Scene contains procedures for recording survey video and still images of HST

QUICK CHECK

V10	
O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape count

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
3. Perform 760 SHUTTER PRIORITY (SETUP DATA; DCS NOM)

P/TV13 HST SURVEY (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes	
			35mm	70mm	DCS	PLB	CC	Dnlk		
	1.	<u>-V3 SURVEY</u> <ul style="list-style-type: none"> ● Video Survey of HST surfaces post berthing ● Mapping of HST surfaces (see diagrams, FS 1-59 thru FS 1-64) w/emphasis on: <ul style="list-style-type: none"> a. -V2,+V2 hinge protrusions (include some blanket in image) b. Tension springs c. Inboard/outboard hinges d. AS door, latches, seals, edges, handrails e. WF/PC (latch, hinges, door seals) f. Equip sections C-H g. HGA (hole, latch, gimbal cable routing, interference) h. Handrails 			760 80-200mm					
						<u>WRIST</u>			LIVE Preferred	
									DNLK	Dnlk of items a,b,c (see diagrams, FS 1-59, FS 1-60, FS 1-62, & FS 1-63) prior to SDM retraction Use audio files to identify areas covered

P/TV13 HST SURVEY (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes	
			35mm	70mm	DCS	PLB	CC	Dnlk		
	2.	<u>+V3 SURVEY</u>								
		<ul style="list-style-type: none"> ● Video survey of HST surfaces 				A,D (B,C while in -V3 fwd posn)			PLBK	
		<ul style="list-style-type: none"> ● Mapping of HST surfaces (see diagrams, FS 1-65 & FS 1-66) w/emphasis on: <ul style="list-style-type: none"> a. FGS #2 (latches, seals, edges) b. Bays 6-9 (before, after MLI installation) c. HGA (latch, gimbal cable routing, interferences) d. MSS 1,2 e. Handrails 			760 80-200mm				DNLK	Use audio files to identify areas covered
	3.	<u>-V2 SURVEY</u>								
		<ul style="list-style-type: none"> ● Video survey of HST surfaces 				A,D			PLBK	
		<ul style="list-style-type: none"> ● Mapping of HST surfaces (see diagrams FS 1-67 & FS 1-68) w/emphasis on: <ul style="list-style-type: none"> a. AS doors pre,post EVA (latches, seals, edges, handrails) b. FGS #1 (latches, seals, edges, handrails) c. Bay door 10 (MLI) d. HGA (dish, latch, gimbal cable routing, interferences) e. ES A,B f. Handrails 			760 80-200mm				DNLK	Use audio files to identify areas covered

P/TV13 HST SURVEY (Continued)

OPS (Concluded)

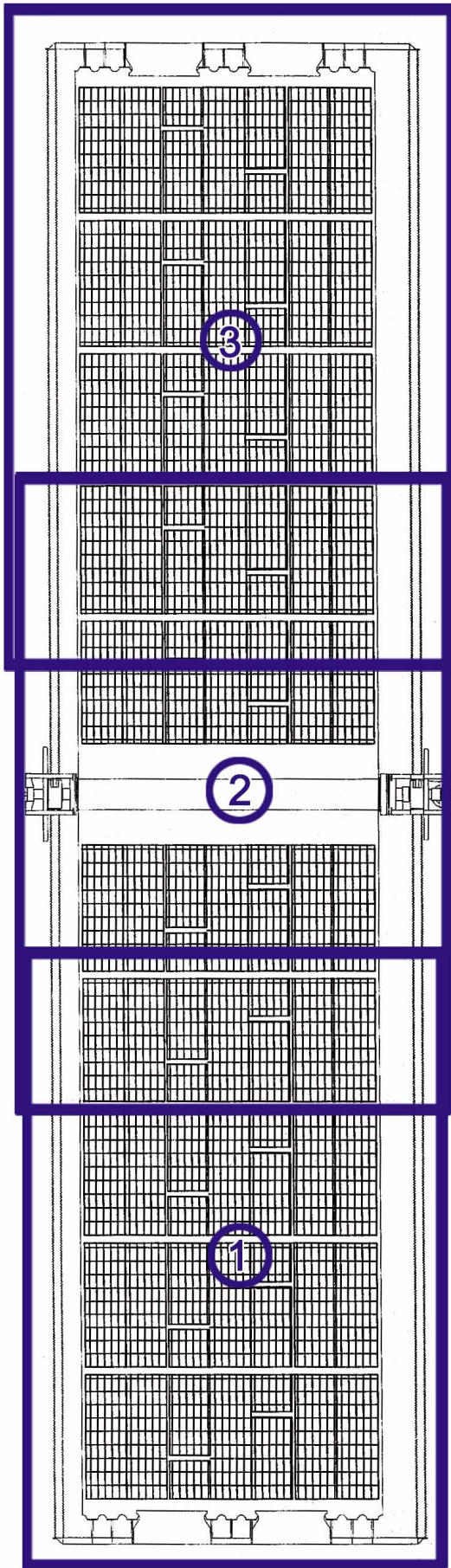
✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	4.	<u>+V2 SURVEY</u> <ul style="list-style-type: none"> • Video survey of HST surfaces 				<u>A,D</u>		PLBK	
		<ul style="list-style-type: none"> • Mapping of HST surfaces (see diagrams FS 1-69 & FS 1-70) w/emphasis on: <ul style="list-style-type: none"> a. AS doors pre,post EVA (latches, seals, edges, handrails) b. Radiator post EVA (closeup of outer edges, latches, handrails) c. FGS #3 d. Bay doors 5,6 (MLI) e. HGA f. ES H,J 			760 80-200mm			DNLK	Use audio files to identify areas covered

If operations temporarily suspended, perform DEACTIVATION as reqd
 If operations completed, go to DEACTIVATION

DEACTIVATION

1. DCS 760
 Exp Mode – P
 Pwr – OFF
 Flash ON/OFF – ON
 Start batt recharge as reqd
2. TV System
 Go to DEACTIVATION (Cue Card, TV) as reqd

P/TV13 HST SURVEY (Continued)



STS-109
DCS Survey
FD 3

-V2 SA
(starboard)

80-200 mm lens
at 80 mm

Mark circles
to indicate
photos taken

Overall Priorities

- 1. DCS 80mm -V2 SA
- 2. DCS 80mm +V2 SA
- 3. DCS 80mm HST Body
- 4. DCS 200mm -V2 SA
- 5. DCS 200mm +V2 SA
- 6. DCS 200mm HST Body

STS-109
DCS Survey
FD 3

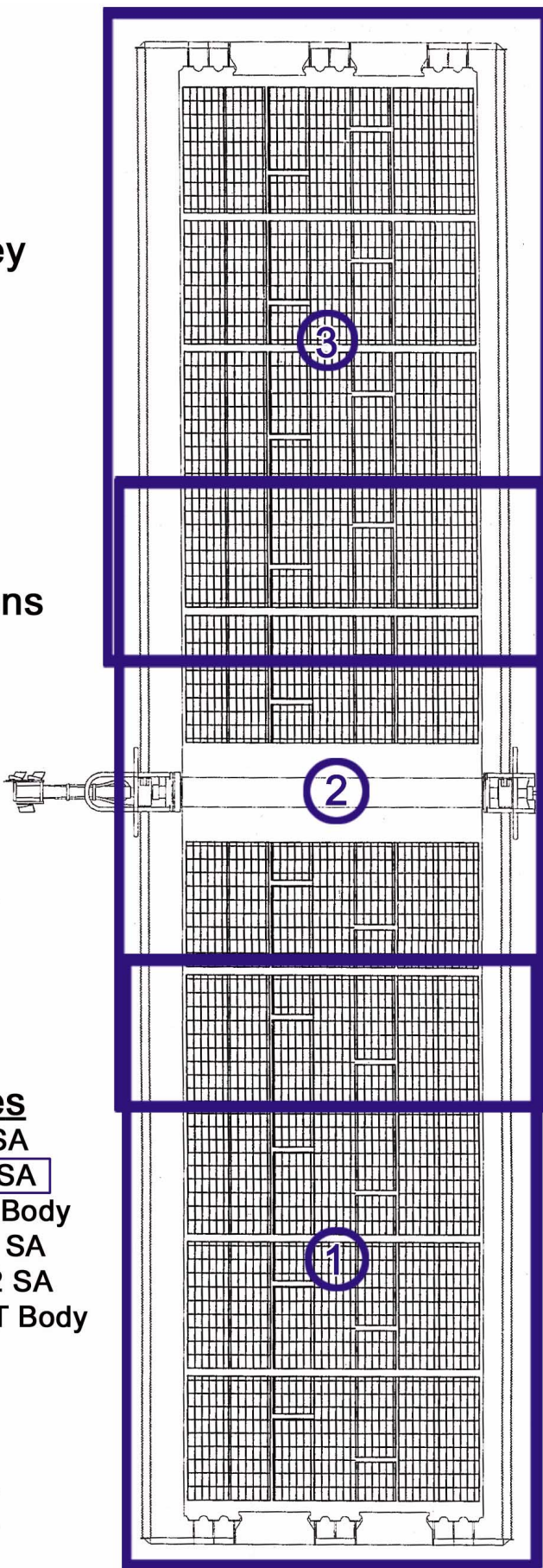
+V2 SA
(port)

80-200 mm lens
at 80 mm

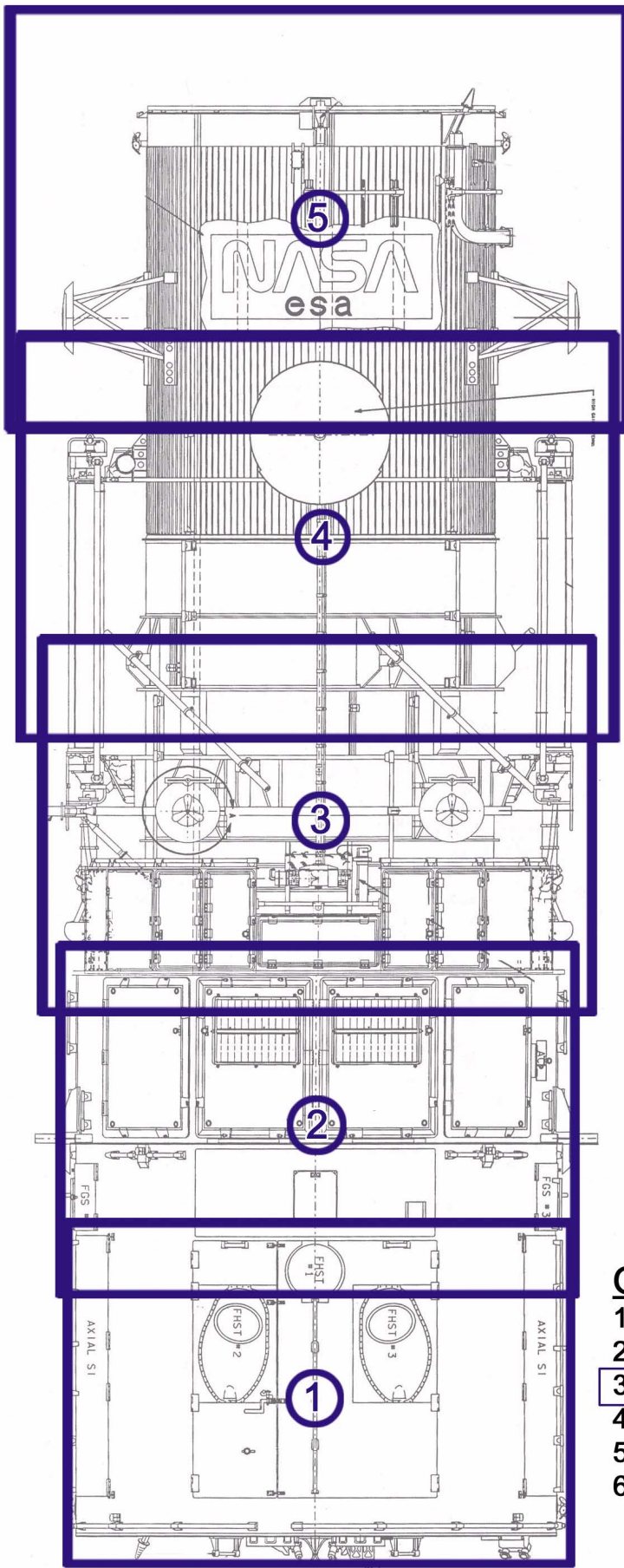
Mark circles
to indicate
photos taken

Overall Priorities

- 1. DCS 80mm -V2 SA
- 2. DCS 80mm +V2 SA
- 3. DCS 80mm HST Body
- 4. DCS 200mm -V2 SA
- 5. DCS 200mm +V2 SA
- 6. DCS 200mm HST Body



P/TV13 HST SURVEY (Continued)



STS-109
DCS Survey
FD 3

-V3

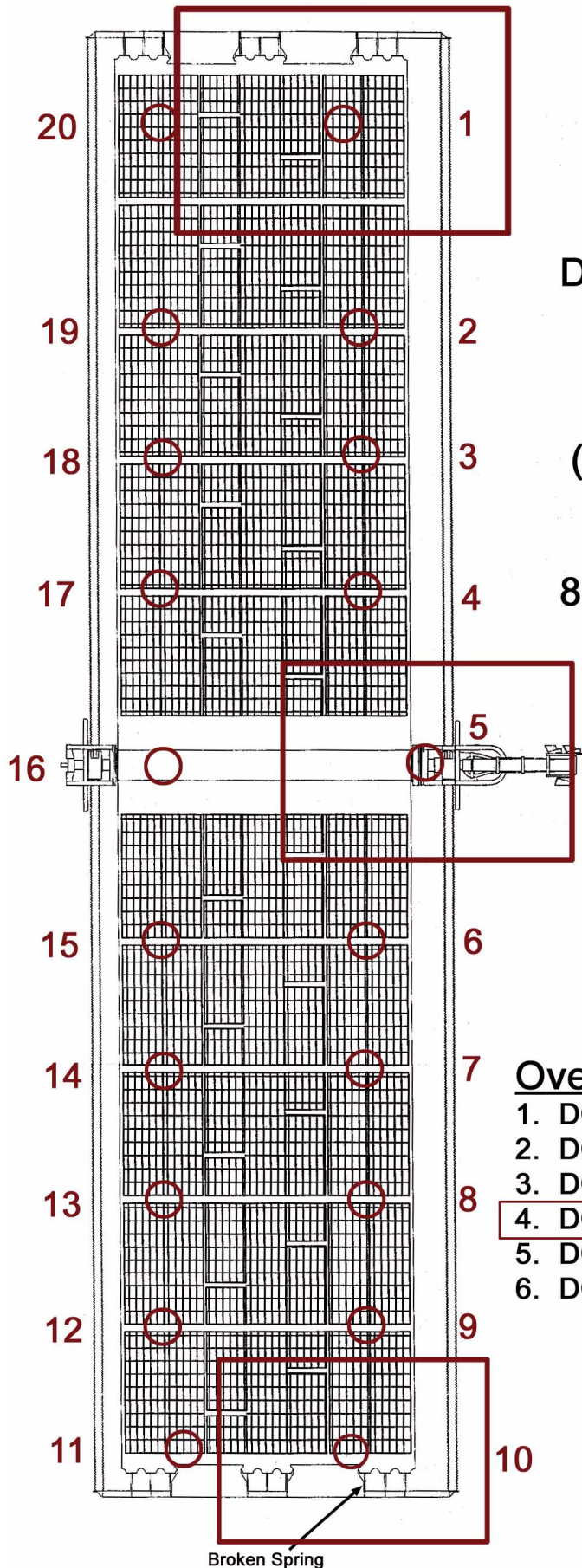
80-200mm lens
at 80mm

Mark circles
to indicate
photos taken

Overall Priorities

1. DCS 80mm -V2 SA
2. DCS 80mm +V2 SA
3. DCS 80mm HST Body
4. DCS 200mm -V2 SA
5. DCS 200mm +V2 SA
6. DCS 200mm HST Body

P/TV13 HST SURVEY (Continued)



STS-109
DCS Survey
FD 3

-V2 SA
(starboard)

80-200 mm lens
at 200 mm

Mark circles
to indicate
photos taken

shoot in numbered
sequence if possible

Overall Priorities

1. DCS 80mm -V2 SA
2. DCS 80mm +V2 SA
3. DCS 80mm HST Body
4. DCS 200mm -V2 SA
5. DCS 200mm +V2 SA
6. DCS 200mm HST Body

STS-109
DCS Survey
FD 3

+V2 SA
(port)

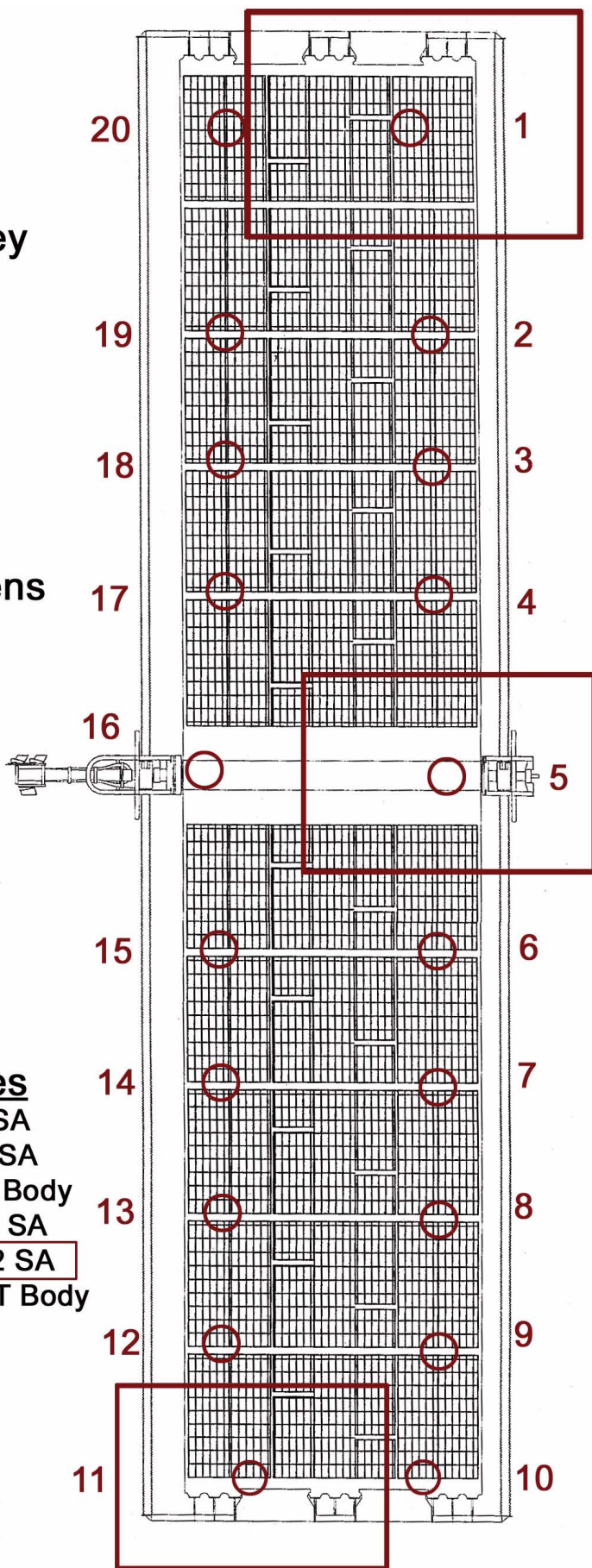
80-200 mm lens
at 200 mm

Mark circles
to indicate
photos taken

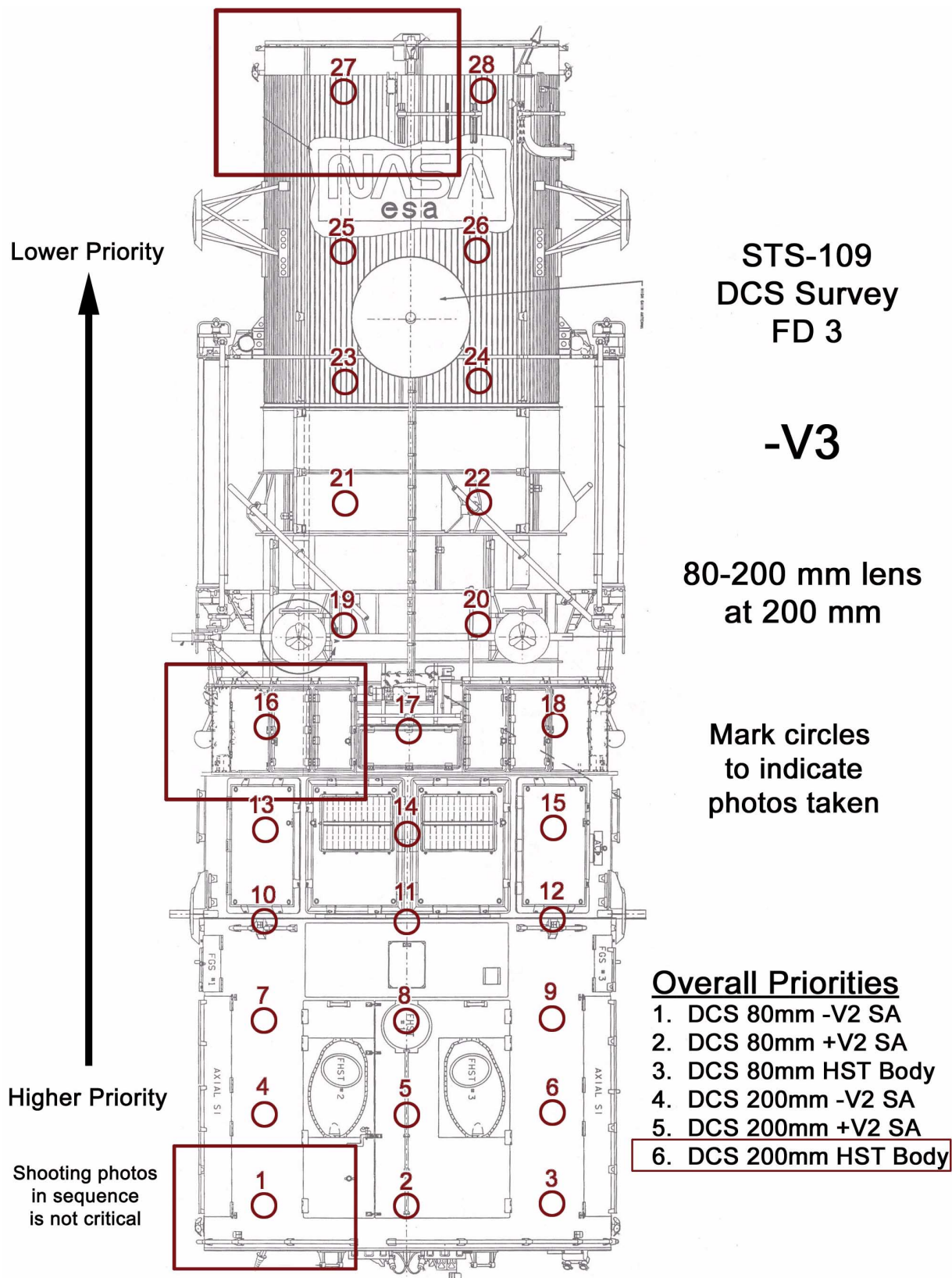
shoot in numbered
sequence if possible

Overall Priorities

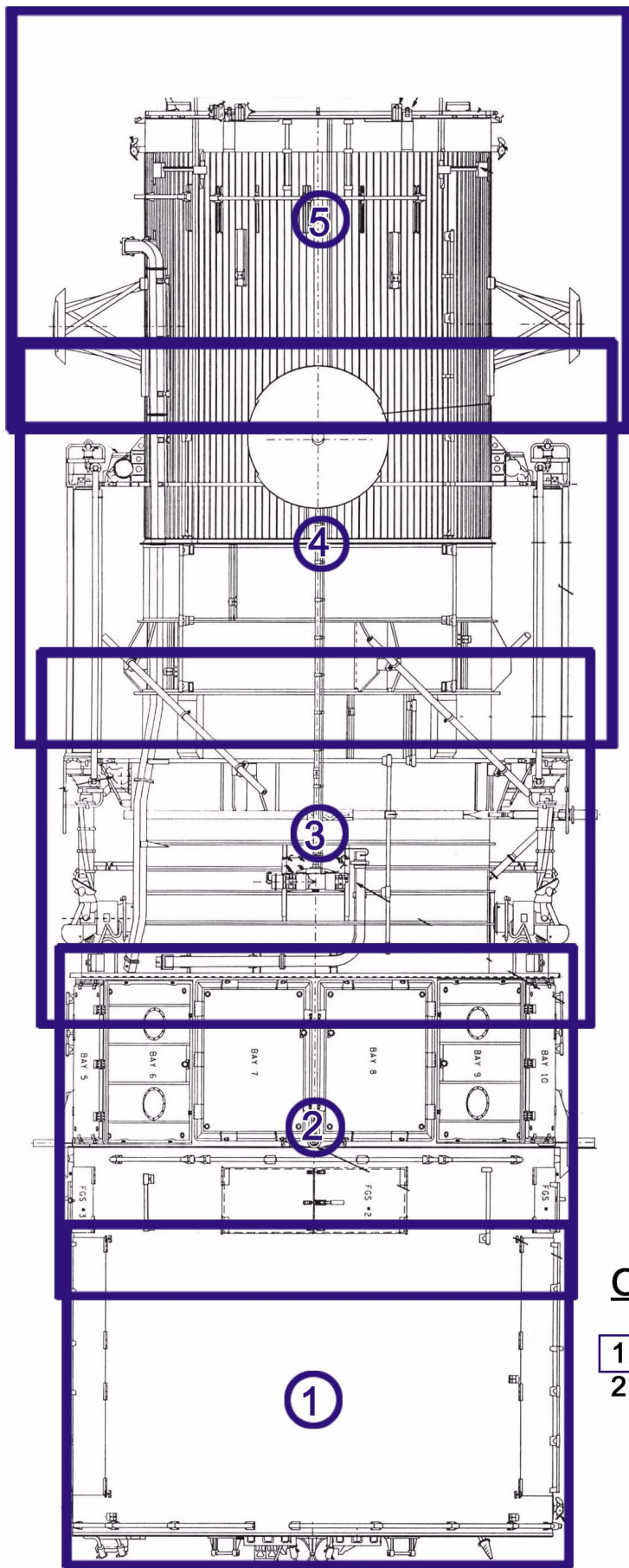
1. DCS 80mm -V2 SA
2. DCS 80mm +V2 SA
3. DCS 80mm HST Body
4. DCS 200mm -V2 SA
5. DCS 200mm +V2 SA
6. DCS 200mm HST Body



P/TV13 HST SURVEY (Continued)



P/TV13 HST SURVEY (Continued)



STS-109
DCS Survey

+V3

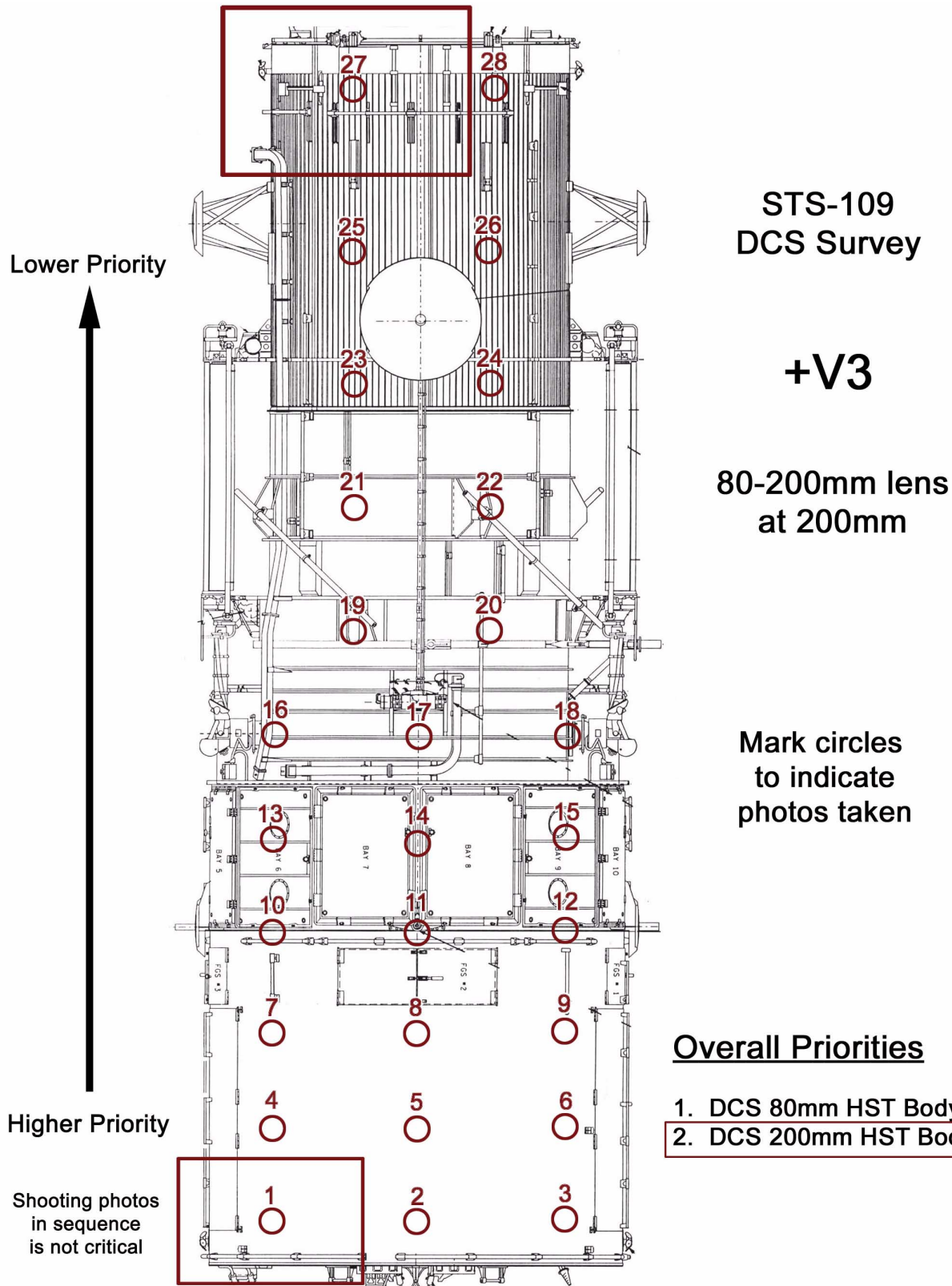
80-200mm lens
at 80mm

Mark circles
to indicate
photos taken

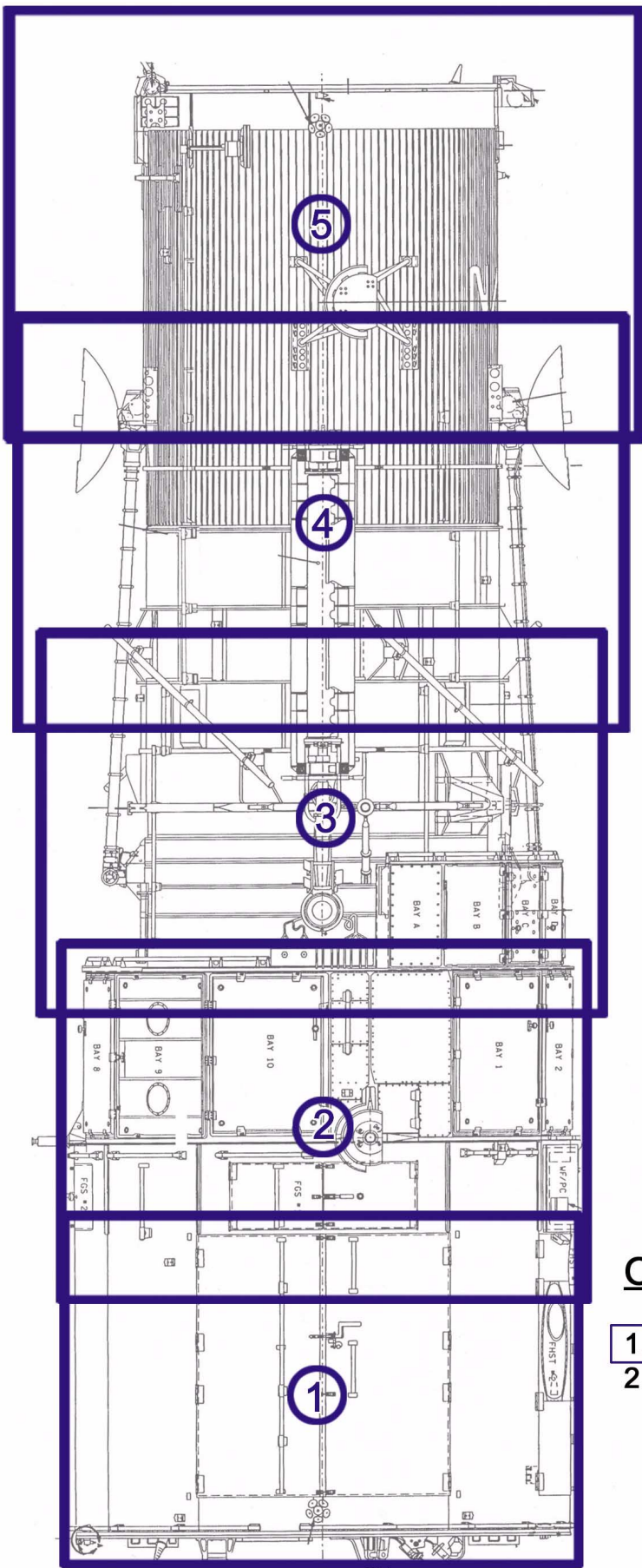
Overall Priorities

- 1. DCS 80mm HST Body
- 2. DCS 200mm HST Body

P/TV13 HST SURVEY (Continued)



P/TV13 HST SURVEY (Continued)



STS-109
DCS Survey

-V2

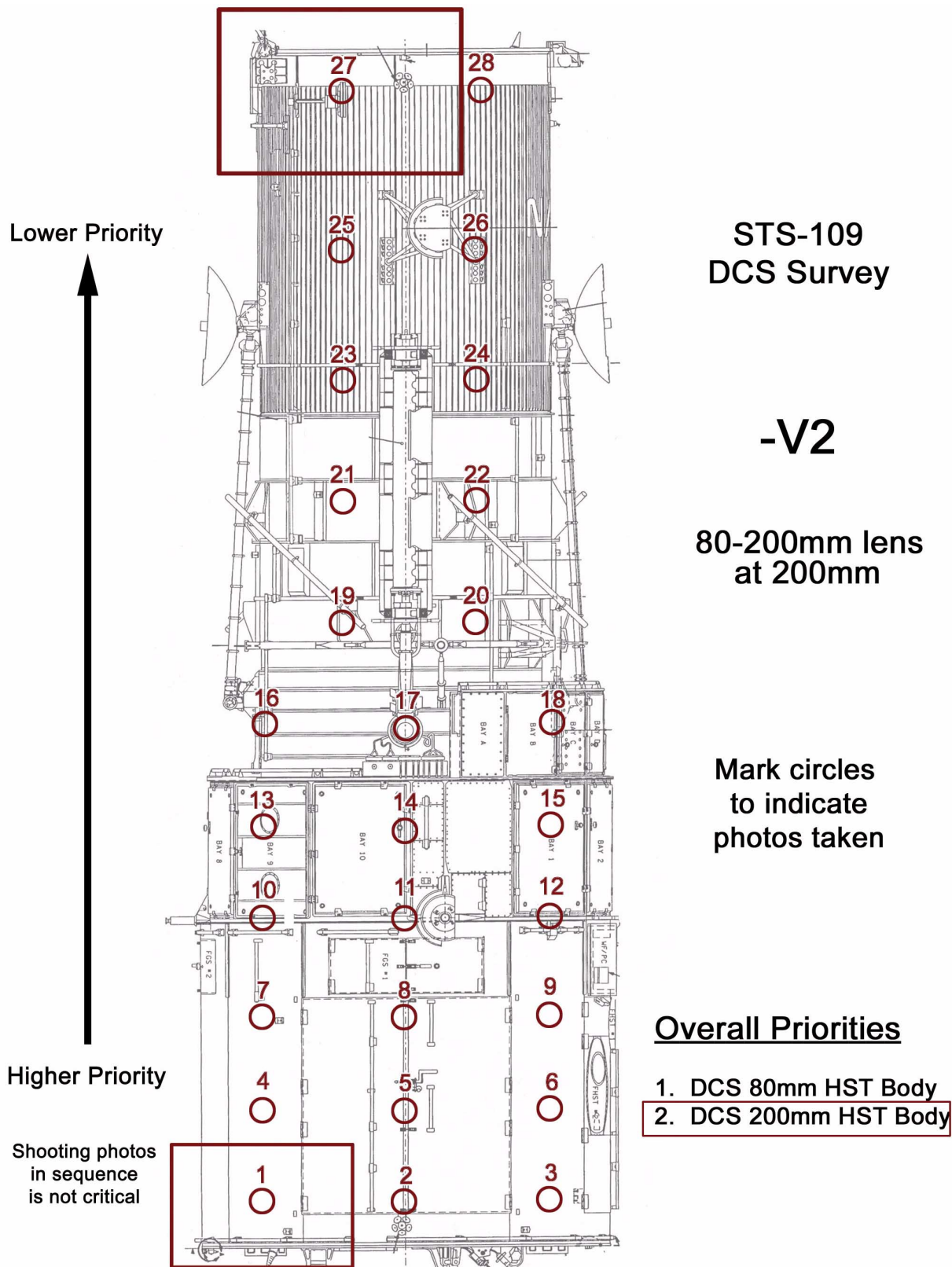
80-200mm lens
at 80mm

Mark circles
to indicate
photos taken

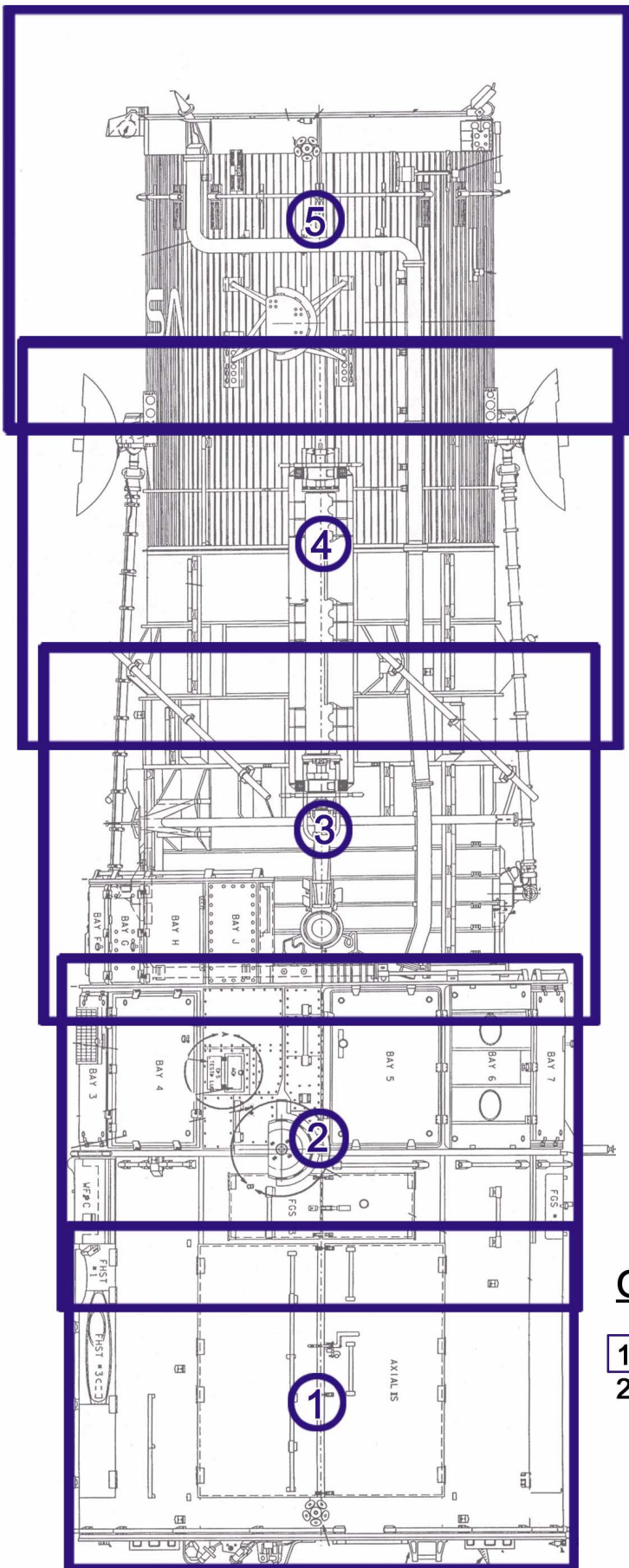
Overall Priorities

- 1. DCS 80mm HST Body
- 2. DCS 200mm HST Body

P/TV13 HST SURVEY (Continued)



P/TV13 HST SURVEY (Continued)



**STS-109
DCS Survey**

+V2

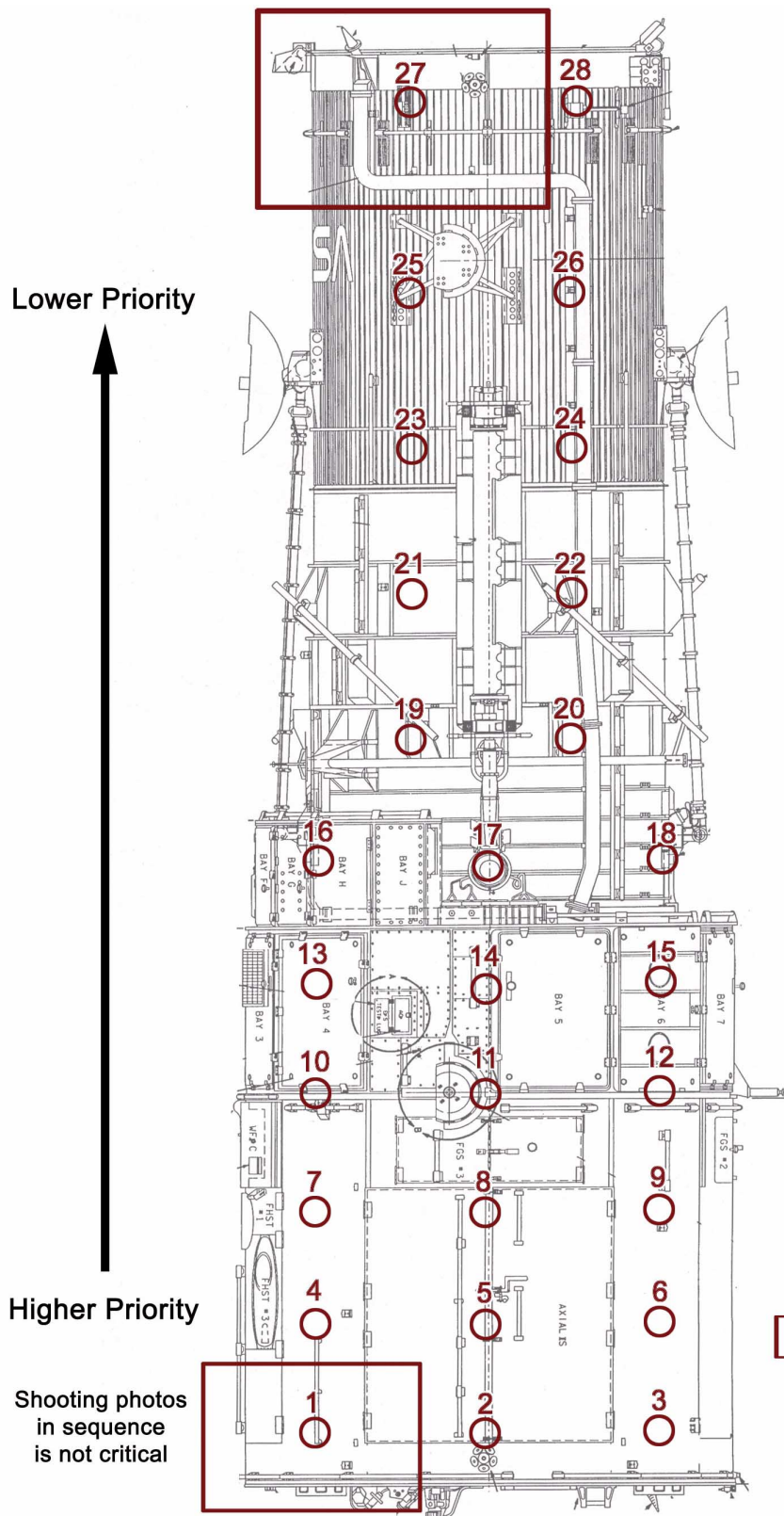
**80-200mm lens
at 80mm**

**Mark circles
to indicate
photos taken**

Overall Priorities

- 1. DCS 80mm HST Body**
- 2. DCS 200mm HST Body**

P/TV13 HST SURVEY (Concluded)



**STS-109
DCS Survey**

+V2

**80-200mm lens
at 200mm**

**Mark circles
to indicate
photos taken**

Overall Priorities

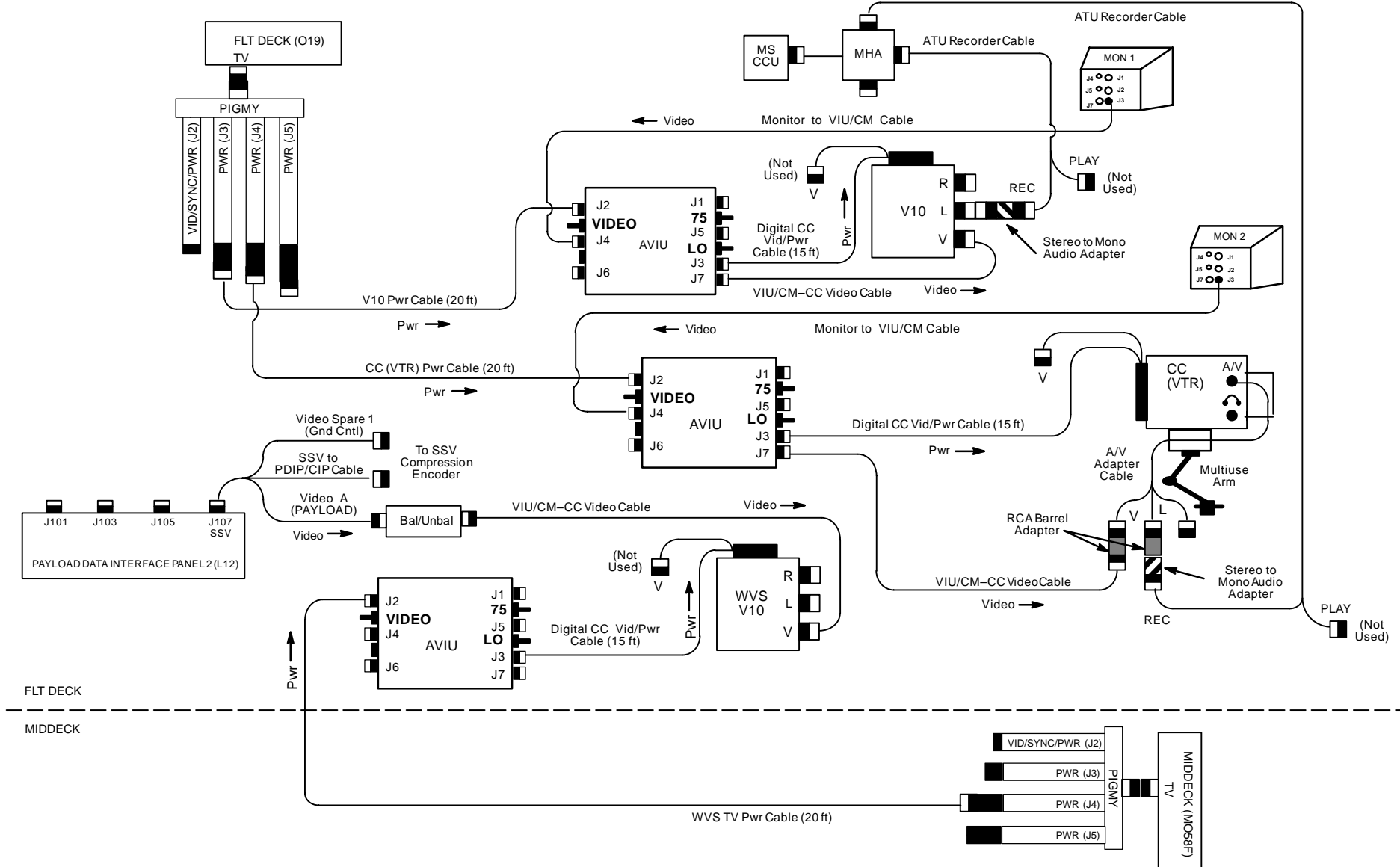
1. DCS 80mm HST Body
2. DCS 200mm HST Body

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P/TV14 SA MONITOR

P/TV14 HST SA MONITORING

H/W SUMMARY



P/TV14 HST SA MONITORING (Continued)

SCENE SYNOPSIS

Scene contains procedures for recording solar array retractions, slews

QUICK CHECK

V10 (two)		CC (VTR)	
O19,MO58F	✓TV Pwr – ON	O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape count

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC (VTR))
3. Config Third Source Recording Device
Config H/W per dwg at right (use WVS V10)

AVIU

SYNC/VIDEO – VIDEO
HI-Z/75 – 75
PWR SELECT – LO

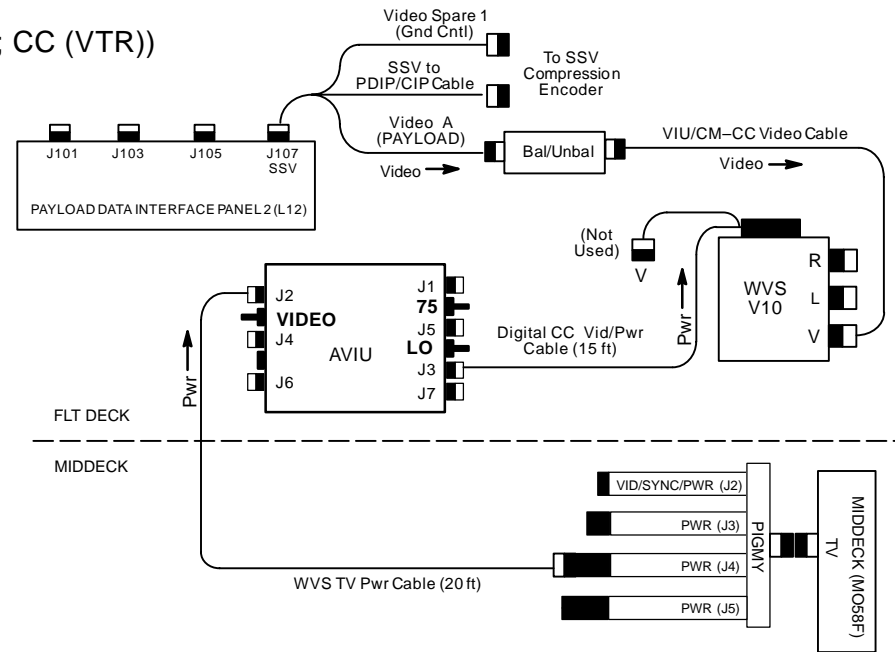
MO58F

✓TV PWR – ON

V10


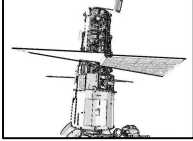
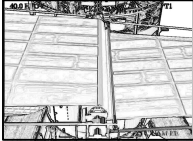
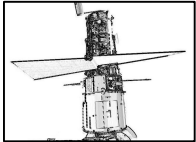
PWR – ON
Tape – Install
DISPLAY pb – Toggle to display tape counter

4. Perform ACTIVATION, OPERATION
(Cue Card, TV) as reqd
5. Perform 760 SHUTTER PRIORITY
(SETUP DATA; DCS NOM)



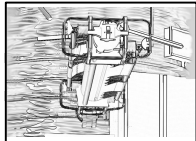
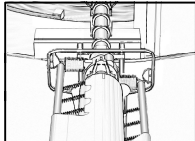
P/TV14 HST SA MONITORING (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	DnIk	
	1.	<u>SA SLEWS</u> <ul style="list-style-type: none"> Muxed video view of both SAs during Slew Ops 				<u>MUX A,D</u>		PLBK (If no Ku)	Fill FOV w/whole SA
	2.	<u>SA SDM RETRACTION</u> <ul style="list-style-type: none"> Edge-on video view of ±V2 SA including spreader bar, bi-stem(s) using SDM Retraction overlays 				<u>D (w/Overlay), WRIST,A</u>		LIVE MUX D, WRIST	Camr D Pointing View (Full Zoom IN)  Camr D Final Posn (Zoom Out)  HFOV = 74° WRIST Camr  HFOV = 40° Camr A 

P/TV14 HST SA MONITORING (Continued)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	2.	<u>SA SDM RETRACTION</u> (Concluded)							Narrate on tape during ops via ORB comm Use specific overlay based on posn of SA Overlay 1: -10° Slew Overlay 2: -5° Slew Overlay 3: 0° Slew Overlay 4: +5° Slew Overlay 5: +10° Slew
		<ul style="list-style-type: none"> • Video, still survey of retracted SAs (-V2 SA at -V2, V3 fwd posns and +V2 SA at +V2, -V3 fwd posns <ul style="list-style-type: none"> a. Thermal shields b. Inner/outer regions of drum c. Hinge pin protrusions d. Fwd, aft latches 			760 80-200mm  From W9	<u>WRIST</u> 		LIVE (PLBK)	Narrate on tape during ops via ORB comm Dnlk DCS images prior to crew sleep

If operations temporarily suspended, perform DEACTIVATION as reqd
If operations completed, go to DEACTIVATION

P/TV14 HST SA MONITORING (Concluded)

DEACTIVATION

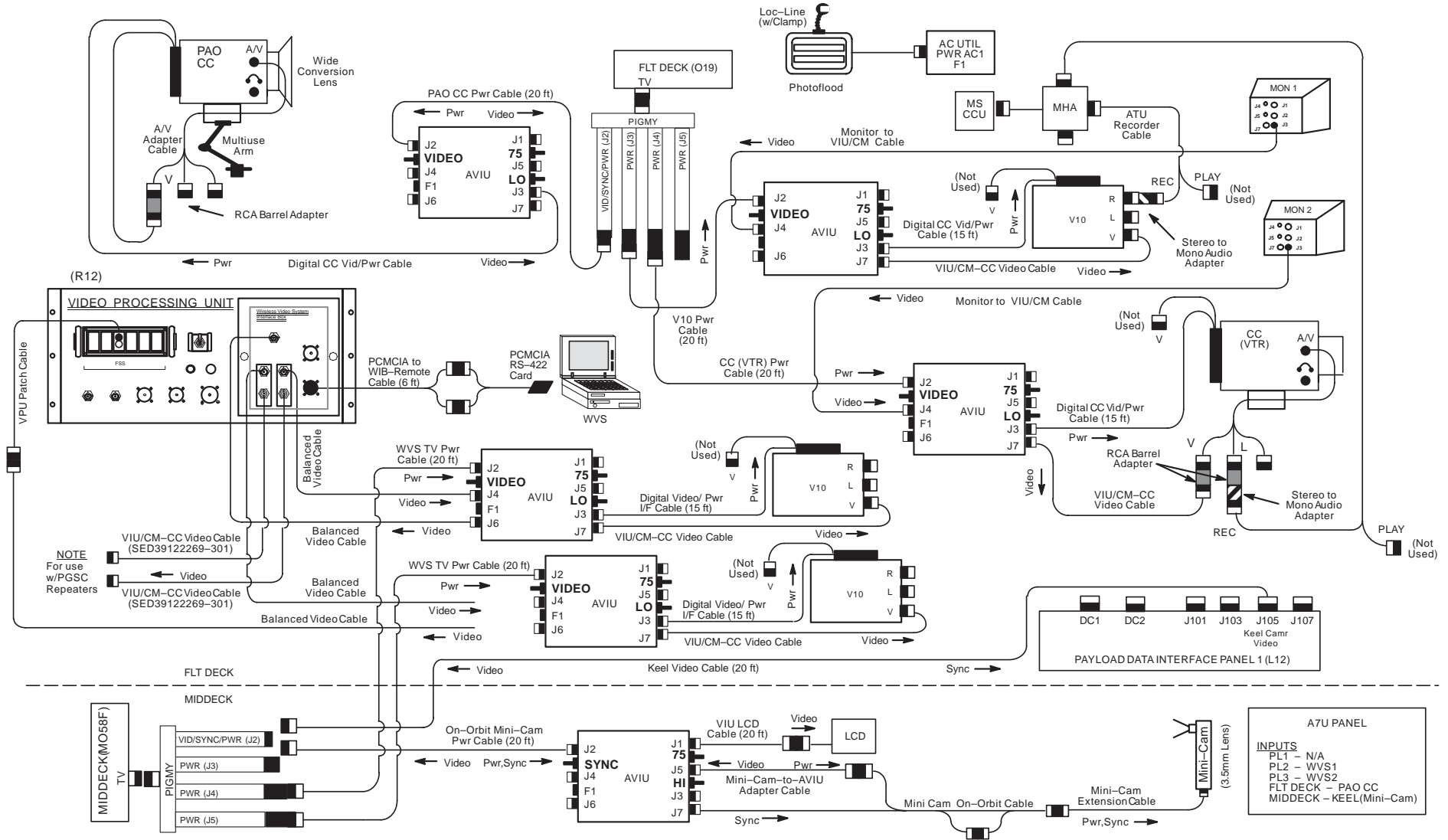
1. DCS 760
Exp Mode – P
Pwr – OFF
Flash ON/OFF – ON
Start batt recharge as reqd
2. Return WVS V10 to nom config
3. TV System
Go to DEACTIVATION (Cue Card, TV) as reqd

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P/TV15 HST EVA

P/TV15 HST EVA

H/W SUMMARY



P/TV15 HST EVA (Continued)

SCENE SYNOPSIS

Scene contains procedures for documenting HST EVA and IVA ops w/video, still photos

QUICK CHECK

V10 (three)		CC (VTR)		PAO CC	
O19 (MO58F)	✓TV Pwr – ON	O19	✓TV Pwr – ON	O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – CAMERA ✓Tape installed ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK FOCUS – AUTO
				F1	✓AC UTIL PWR AC1 – ON
				Photoflood	ON/OFF – ON
Mini-Cam		WVS		Keel Camr	
MO58F	✓On-Orbit Mini-Cam Pwr Cable connected to PIGMY J2 Vid/Sync/Pwr ✓TV Pwr – ON	A7	✓Wireless Video Heater – ON Pwr – ON	MO58F	✓Keel Video Cable connected to PIGMY J2 Vid/Sync/Pwr ✓TV Pwr – ON
LCD	PWR – ON ✓Exposure			L11 (SSP 3)	KEEL CAM ENA – ON

P/TV15 HST EVA (Continued)

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC(VTR))
3. Perform PAO CC (SETUP DATA; PAO CC)
4. ✓P/TV07 EVA CAMR SETUP, EVA STILL CAMR (F5), WIRELESS VIDEO SYSTEM (WVS), steps 1–3 performed
5. Config Mini-Cam for In-Cabin Viewing (Dnlk)
Config H/W per dwg at right

AVIU

SYNC/VIDEO – SYNC
HI-Z/75 – 75
PWR SELECT – HI

MO58F

✓TV PWR – ON

LCD

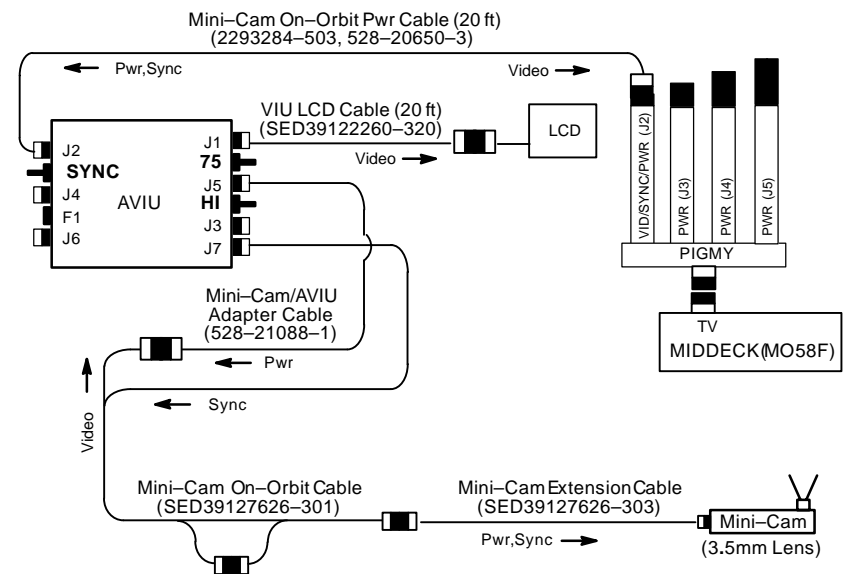
LCD Pwr – ON

Mini-Cam

Lens – 3.5mm
Lens Aperture – Adjust per LCD
Secure Camr in airlock viewing posn
w/Velcro (tape)

NOTE

Camr can be relocated to Flt Deck for IVA ops viewing once EVA begins



P/TV15 HST EVA (Continued)

SETUP (Continued)

6. Perform KEEL CAMR (SETUP DATA; KEEL CAMR)
7. Config WVS PGSC

A11
PGSC

PGSC Pwrup and Application Opening

✓DC UTIL PWR MNC – ON

Pwr – ON

Sel appropriate Expansion Unit config at Startup Menu, then press [Enter]

Sel SHUTTLE APPS icon

Sel WVS icon

Sel 'YES' at 'RESTORE TO PREVIOUS SETTINGS' window
RF Camera page will appear

NOTE

During EVA prep, EMU TV assy will be pwr'd

Application Setup

Select Page – XCVR

Transceiver 1(2) CMD Power – ON (green CMD PWR:LVL– “ON:Min”)

Sel RF Camera 1 – One EVA crewmember (green “ON”)

Sel RF Camera 2 – Other EVA crewmember (green “ON”)

If crewmember designations not in pulldown menu:

✓RF Camera 1,2 – None

Perform CAMERA ID ASSIGNMENT (Cue Card, WVS), then:

Reattempt RF Camr assignments

If alert msg, perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)

P/TV15 HST EVA (Continued)

SETUP (Concluded)

7. Config WVS PGSC (Concluded)

Verification of Initial Parameters

Sel Miscellaneous

✓Local Diversity selected (check mark)

Under Transceiver 1,2, ✓ANTENNA (both) – Auto

Near middle of page, sel Advanced Controls icon (✓Advanced Controls appear at bottom)

✓IF – Wide

Select Page – RF Camera

For C,L,R lens on each RF Camr Assy:

✓Electronic Shutter – Auto

✓White Balance Control – Auto

Under Advanced Controls, ✓Automatic Gain Control – Disabled

Under Advanced Controls:

✓Power (both) – ON

✓S–Band Level (both) – Dynamic

8. Perform ACTIVATION,OPERATION (Cue Card, TV)
9. Perform F5 PROGRAM w/FLASH (SETUP DATA; 35mm NOM)
10. Perform 203 PLB EXPOSURES (SETUP DATA; 70mm NOM)
11. Perform 760 PROGRAM w/FLASH (SHUTTER PRIORITY) (SETUP DATA; DCS NOM)

P/TV15 HST EVA (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<u>EVA PREP, ACTIVITIES, CLOSEOUT</u> <ul style="list-style-type: none"> Video, still imagery of EVA Prep, Tool Ops, General EVA Ops, EVA Daily Closeout Ops 	<u>IVA F5</u> (Flash) 28mm ISO 100 CPos <u>EVA F5</u> EVA 28mm(35mm) ISO 100 CPos	<u>203</u> ISO 100 CPos	<u>760</u> (Flash) 35–70mm	<u>WVS,A,B,C,D,</u> <u>ELBOW</u>	<u>Mini-Cam</u> <u>PD100</u> Tape installed		Reqd for each EVA Closeouts for EVAs 1–4
EVA 1									
	2.	<u>LGA COVER INSTALLATION</u> <ul style="list-style-type: none"> Video of cover removal from FSS, installation, final config Still images of LGA prior to cover installation 	<u>EVA F5</u> EVA 28mm(35mm) ISO 100 CPos			<u>WVS,B,C</u>			
	3.	<u>BSP INSTALLATION</u> <ul style="list-style-type: none"> Video of BSP removal from FSS, installation including attach points, pip pins Still images of final config 	<u>EVA F5</u> EVA 28mm(35mm) ISO 100 CPos			<u>WVS,B,C</u>			
	4.	<u>–V2 SA–III, DIODE BOX INSTALLATION</u> <ul style="list-style-type: none"> Video of: <ol style="list-style-type: none"> PDM retraction SA–II removal, stow DB removal, install SA–III unstow, translation, install, PSS and SA deployment 				<u>WVS,A,B,C,D,</u> <u>ELBOW</u>		LIVE (PLBK) PDM Retraction	

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 1 (Concluded)									
	5.	<u>-V2 SA-III, DIODE BOX CLOSEOUT</u> <ul style="list-style-type: none"> ● Closeout video of: <ol style="list-style-type: none"> a. Closeup view of front of DB b. Full view of SA-III w/mast fully deployed c. Fully deployed mast, SA-III panels d. -SA-DBA-1 e. -SA-DBA-2 				<u>WVS.A.D.</u> <u>ELBOW</u>		LIVE (PLBK) SA-III Closeout	Use EVA Photo Closeout Book for details on items d,e
	6.	<u>PCU PREP</u> <ul style="list-style-type: none"> ● Video,still images of Thermal Installation Ops for: <ol style="list-style-type: none"> a. FHSTs b. WF/PC-II c. DBA 2s d. Bays 5,6,10 e. Scan post installation 			<u>760</u> (Shutter) 80-200mm Flash ON/OFF - OFF	<u>WVS.A.D.</u>		PLBK desired	DNLK DCS shots of Bays 5,6 prior to -V3 positioning Shoot FHST attach points prior to thermal cover installation

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 2									
	7.	<u>+V2 SA-III, DIODE BOX INSTALLATION</u> <ul style="list-style-type: none"> ● Video of: <ol style="list-style-type: none"> a. PDM retraction b. SA-II removal and stow c. DB removal, install d. SA-III unstow, install, PSS and SA deployment 				<u>WVS.A.B.C.D.</u> <u>ELBOW</u>		PLBK PDM Retraction if no Ku	
	8.	<u>+V2 SA-III, DIODE BOX CLOSEOUT</u> <ul style="list-style-type: none"> ● Closeout video of: <ol style="list-style-type: none"> a. Closeup view of front of DB b. Full view of SA-III w/mast fully deployed c. Fully deployed mast, SA-III panels d. +SA-DB2-1 e. +SA-DB2-2 f. View of completed Cross Strap Harness installation w/emphasis on portions that may block DBA-2 radiator surfaces (\pm V2), portions that may hinder SSM Bay 5 door opening, final config of MLI Tent (+V2) 				<u>WVS.A.D.</u> <u>ELBOW</u>		LIVE (PLBK SA-III Closeout)	Use EVA Photo Closeout Book for details on items d,e Item f can be done during non-EVA survey

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 2 (Concluded)									
	9.	<u>RWA INSTALLATION</u> <ul style="list-style-type: none"> ● Video of RWA #1 removal from HST, translation to and installation into LOPE ● Video of RWA #1R installation including removal from LOPE, translation to HST worksite, overall installation in Bay 6 ● Closeout video of connector mates on boxes, keyway fasteners, mated heater connectors, overall view of installation 				<u>WVS.A.D.</u> <u>ELBOW</u>			

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 3									
	10.	<u>PCU INSTALLATION</u> <ul style="list-style-type: none"> ● Video of PCU installation ops 				<u>WVS,A,D</u>		PLBK desired	
	11.	<u>PCU CLOSEOUTS</u> <ul style="list-style-type: none"> ● Video of PCU closeouts including: <ul style="list-style-type: none"> a. Prior to Bay 4 door closure b. After Bay 4 closure c. Bays 2,3 batt reconnect, door closure, door w/j-hooks engaged d. SA pwr connector remate, removal of thermal covers e. PCUR-1 f. PCUR-2 g. 2VIK-1 h. 3VIK-1 				<u>WVS</u>		LIVE (PLBK)	Use EVA Photo Closeout Book for details on items e,f,g,h

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 4									
	12.	<u>ACS INSTALLATION</u> <ul style="list-style-type: none"> ● Video of FOC removal including installation into side and view of empty bay post-FOC removal ● Video of ACS installation ops including final config before, after AS Door closure <ol style="list-style-type: none"> a. ACS-1 b. ACS-2 ● Still images of AS Door after door closure 	EVA F5 EVA 28mm(35mm) ISO 100 CPos			<u>WVS.A.D</u>		PLBK desired	Use EVA Photo Closeout Book for details on ACS closeouts
	13.	<u>ESM INSTALLATION</u> <ul style="list-style-type: none"> ● Video of ESM removal (including contamination cover), translation to HST ● Video of ESM installation ops including securing of bridge latches, securing of gnd strap ● Closeout video: <ol style="list-style-type: none"> a. CASH-1 b. ESM-1 c. ESM-2 d. ESM-3 e. COS-1 f. COS-2 ● Still image of secured MULE contamination cover 	EVA F5 EVA 28mm(35mm) ISO 100 CPos			<u>WVS.B.C</u>		LIVE (PLBK) LIVE (PLBK)	Use EVA Photo Closeout Book for details on items a thru f

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 4 (Concluded)									
	14.	<u>PCU CLEANUP</u> <ul style="list-style-type: none"> ● Video of PCU Cleanup Ops 				<u>WVS.A.D</u>			

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 5									
	15.	<u>NCS INSTALLATION</u> <ul style="list-style-type: none"> ● Video of NCS installation including: <ol style="list-style-type: none"> a. AS Door open,secure b. NICMOS vent line close/removal c. H/W transfer,stowage d. NCC install e. Radiator install f. CPL routing g. I/F connections 				<u>WVS.A.D</u>			

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 5 (Continued)									
	16.	<u>NCS CLOSEOUT</u> <ul style="list-style-type: none"> ● Video closeout of: <ul style="list-style-type: none"> a. H/W prior to door closure b. AS Door closure (latches, edges, seals) c. Entire radiator skirt surface, latch I/F to handrails (look for possible light leaks) d. NCC-1 e. NCC-2 f. NCC-3 g. NCC-4 h. NCC-5 i. P600-1 j. NCSR-1 k. NCSR-2 l. NCSR-3 m. NCSR-4 				<u>WVS.WRIST</u>		LIVE (PLBK)	Use EVA Photo Closeout Book for details on items d thru m
	17.	(If NOBL Installed) <u>NOBL INSTALLATION, CLOSEOUTS (Bays 5.6)</u> <ul style="list-style-type: none"> ● Video, still images of: <ul style="list-style-type: none"> a. Bays 5,6 prior to NOBL installation b. NOBL retrieve, installation ops c. Closeout video scan post installation 	<u>EVA F5</u> EVA 28mm(35mm) ISO 100 CPos		<u>760 (Shutter)</u> 80-200mm Flash ON/OFF – OFF	<u>WVS.A.D.</u>			

P/TV15 HST EVA (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
EVA 5 (Concluded)									
	18.	(If NOBL Installed) <u>NOBL INSTALLATION,</u> <u>CLOSEOUTS (Bays 7,8)</u> ● Video, still image of: a. Bays 7,8 prior to NOBL installation b. NOBL retrieve, installation ops c. Closeout video scan post installation	<u>EVA F5</u> EVA 28mm(35mm) ISO 100 CPos		760 (Shutter) 80–200mm Flash ON/OFF – OFF	<u>WVS.A.D</u>			
	19.	<u>+V2 ASLR</u> (If +V2 ASLR Installed) ● Video of +V2 Aft Shroud Latch Repair (ASLR) including unstow, install, final config				<u>WVS.A.D.</u> <u>ELBOW</u>			
	20.	<u>FINAL WORKSITE</u> <u>CLOSEOUT</u> ● Video final worksite closeout ops including crew cleanup, post EVA activities				<u>WVS.A.B.C.D</u>			

P/TV15 HST EVA (Concluded)

OPS (Concluded)

If operations temporarily suspended, perform DEACTIVATION as reqd
If operations completed, go to DEACTIVATION

DEACTIVATION

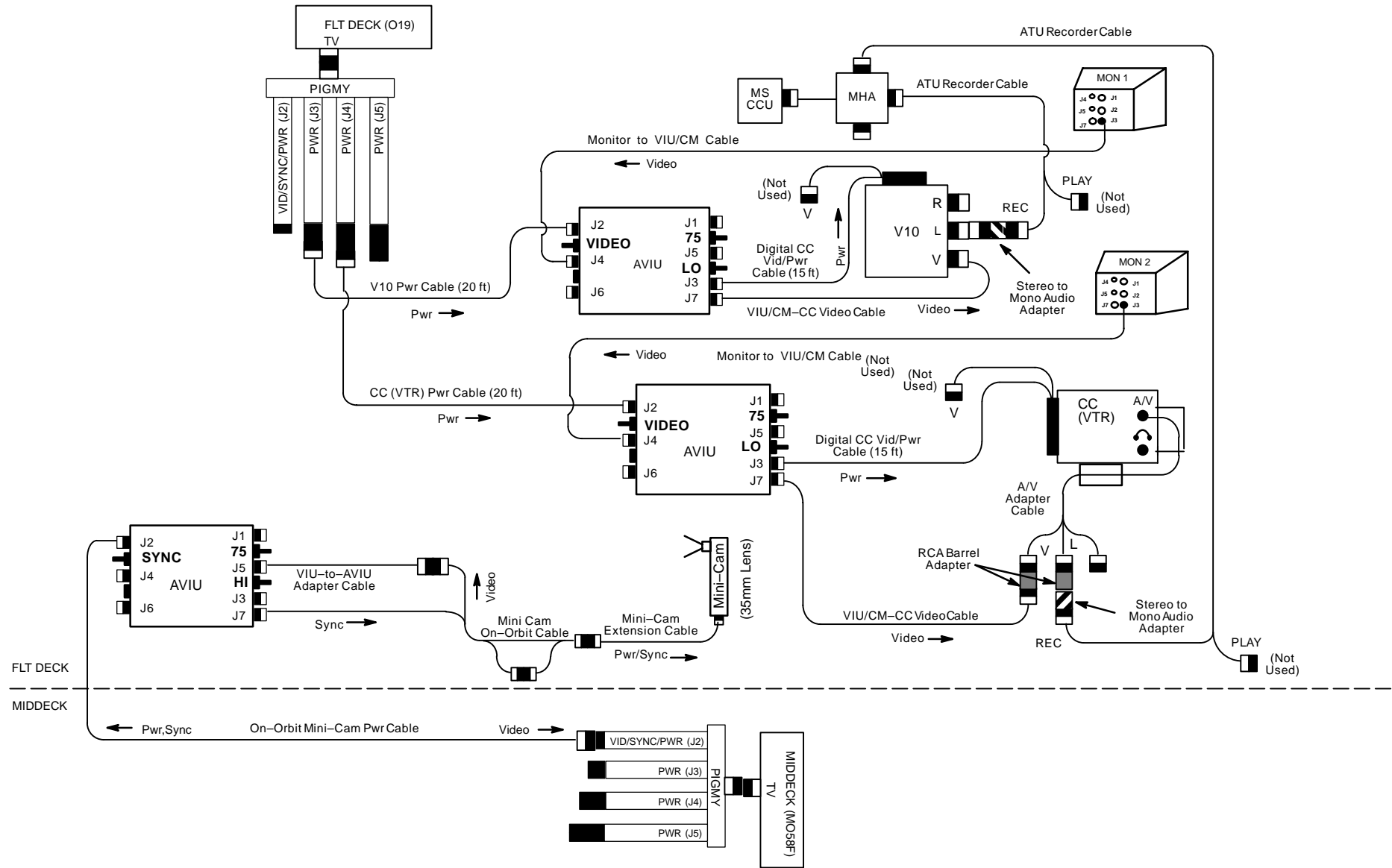
1. EVA 35mm F5
After Camr temp stabilizes:
Thermal Cover – remove
Manually rewind film very slowly, remove, mark, stow
2. IVA 35mm F5
✓Flash ON/OFF – ON
3. DCS 760
✓Exp Mode – P
Pwr – OFF
✓Flash ON/OFF – ON
Start batt recharge as reqd
4. TV System
L10 (SSP 3) KEEL CAM ENA – OFF
Perform PWRDN (Cue Card, WVS)
Go to DEACTIVATION (Cue Card, TV) as reqd

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P/TV16 HST REBOOST

P/TV16 HST REBOOST

H/W SUMMARY



P/TV16 HST REBOOST (Continued)

SCENE SYNOPSIS

Scene contains procedures for documenting HST during reboost ops. Views will be used to measure HST motion and monitoring HGA latch mechanisms. Camr selection, views will vary depending upon HST orientation on HST

QUICK CHECK

V10		CC (VTR)		Mini-Cam	
O19	✓TV Pwr – ON	O19	✓TV Pwr – ON	MO58F	✓On-Orbit Mini-Cam Pwr Cable connected to PIGMY J2
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape count		Vid/Sync/Pwr ✓TV Pwr – ON

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC (VTR))
3. Config Mini-Cam for In-Cabin GMT Clock Viewing
Config H/W per dwg at right

AVIU

SYNC/VIDEO – SYNC
HI-Z/75 – 75
PWR SELECT – HI

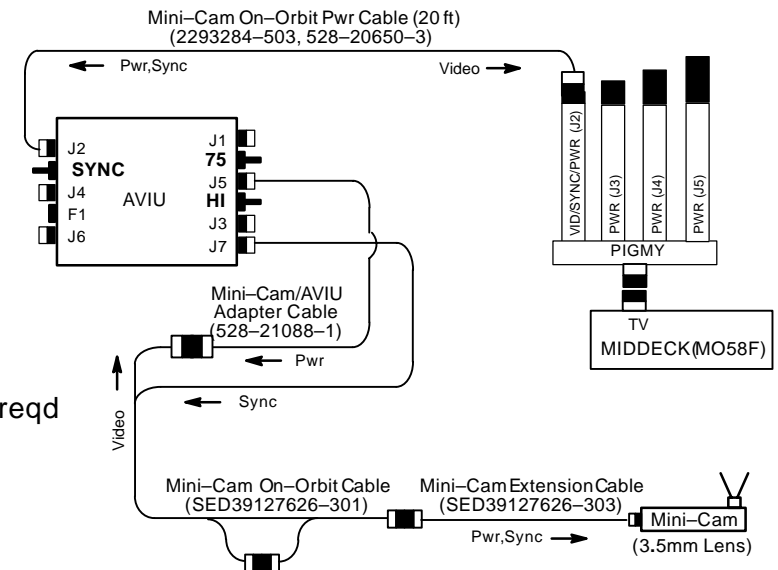
MO58F

✓TV PWR – ON

Mini-Cam

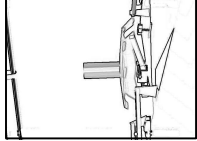
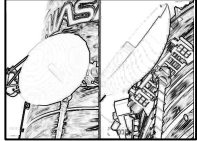
Lens – 3.5mm
Lens Aperture – Adjust per Monitor

4. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd



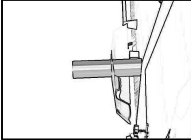
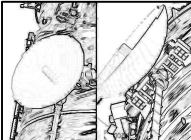
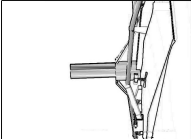
P/TV16 HST REBOOST (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	HST REBOOST							
		<ul style="list-style-type: none"> Check illuminators on Display white CDATE, LDATA on both monitors 							
		<ul style="list-style-type: none"> Check GMT Date/Time on V10, CC(VTR) 							
		<ul style="list-style-type: none"> Rcd FD GMT Clock on both recorders at beginning,end of reboost w/o stopping recorders between view of clock, view of PLB targets 				<u>Mini-Cam</u>			
		<ul style="list-style-type: none"> For -V3 Fwd Posn: <ol style="list-style-type: none"> Video of HST port trunnion (Zero Pan/Tilt numbers by pointing Camrs A,B at each other, PAN/TILT RESET) 				<u>B</u>		LIVE (PLBK prior to sleep)	B: Port Trunnion  PAN: -4.2 TILT: 50 HFOV: 10
		<ul style="list-style-type: none"> <ol style="list-style-type: none"> Video of both HGA dishes,latches (Zero Pan/Tilt numbers by pointing Camrs C,D at each other, PAN/TILT RESET) 				<u>MUX: ELBOW,C</u>			MUX: ELBOW,C  ELBOW: Fwd HGA HFOV: 15 C: Aft HGA PAN: -50 TILT: 75 HFOV: 10

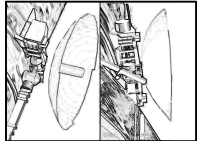
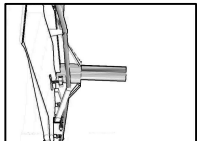
P/TV16 HST REBOOST (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<p>HST REBOOST (Continued)</p> <ul style="list-style-type: none"> • For +V3 Fwd Posn: <ol style="list-style-type: none"> a. Video of HST port trunnion (Zero Pan/Tilt numbers by pointing Camrs A,B at each other, PAN/TILT RESET) b. Video of both HGA dishes, latches (Zero Pan/Tilt numbers by pointing Camrs C,D at each other, PAN/TILT RESET) 				B			<p>LIVE (PLBK prior to sleep)</p> <p>B: Port Trunnion</p>  <p>PAN: -4 TILT: 56 HFOV: 10</p> <p>MUX: ELBOW,C</p>  <p>ELBOW: Fwd HGA HFOV: 15</p> <p>C: Aft HGA PAN: -50 TILT: 75 HFOV: 10</p>
		<ul style="list-style-type: none"> • For +V2 Fwd Posn: <ol style="list-style-type: none"> a. Video of HST +V3 Keel Trunnion (Zero Pan/Tilt numbers by pointing Camrs A,B at each other, PAN/TILT RESET) 				B			<p>LIVE (PLBK prior to sleep)</p> <p>B: Keel Trunnion</p>  <p>PAN: -4.2 TILT: 53 HFOV: 10.0</p>

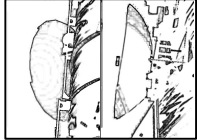
P/TV16 HST REBOOST (Continued)

OPS (Continued)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<p><u>HST REBOOST</u> (Continued)</p> <ul style="list-style-type: none"> • For +V2 Fwd Posn: (Concluded) <ul style="list-style-type: none"> b. Video of both HGA dishes, latches (Zero Pan/Tilt numbers by pointing Camrs C,D at each other, PAN/TILT RESET) 				<p><u>MUX:</u> <u>ELBOW,C</u></p>			<p>MUX: ELBOW,C</p>  <p>ELBOW: Port HGA HFOV: 10</p> <p>C: Stbd HGA PAN: -4.2 TILT: 72 HFOV: 10</p>
		<ul style="list-style-type: none"> • For -V2 Fwd Posn: <ul style="list-style-type: none"> a. Video of HST +V3 Keel Trunnion (Zero Pan/Tilt numbers by pointing Camrs A,B at each other, PAN/TILT RESET) 				<p><u>C</u></p>		<p>LIVE (PLBK prior to sleep)</p>	<p>C: Keel Trunnion</p>  <p>PAN: 4.2 TILT: 53 HFOV: 10</p>

P/TV16 HST REBOOST (Concluded)

OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<u>HST REBOOST</u> (Concluded) <ul style="list-style-type: none"> • For -V2 Fwd Posn: (Concluded) b. Video of both HGA dishes, latches (Zero Pan/Tilt numbers by pointing Camrs C,D at each other, PAN/TILT RESET) 				<u>MUX:</u> <u>ELBOW,B</u>			MUX: ELBOW,B  ELBOW: Stbd HGA HFOV: 10 B: Port HGA PAN: 7.0 TILT: 72 HFOV: 10

If operations temporarily suspended, perform DEACTIVATION as reqd
 If operations completed, go to DEACTIVATION

DEACTIVATION

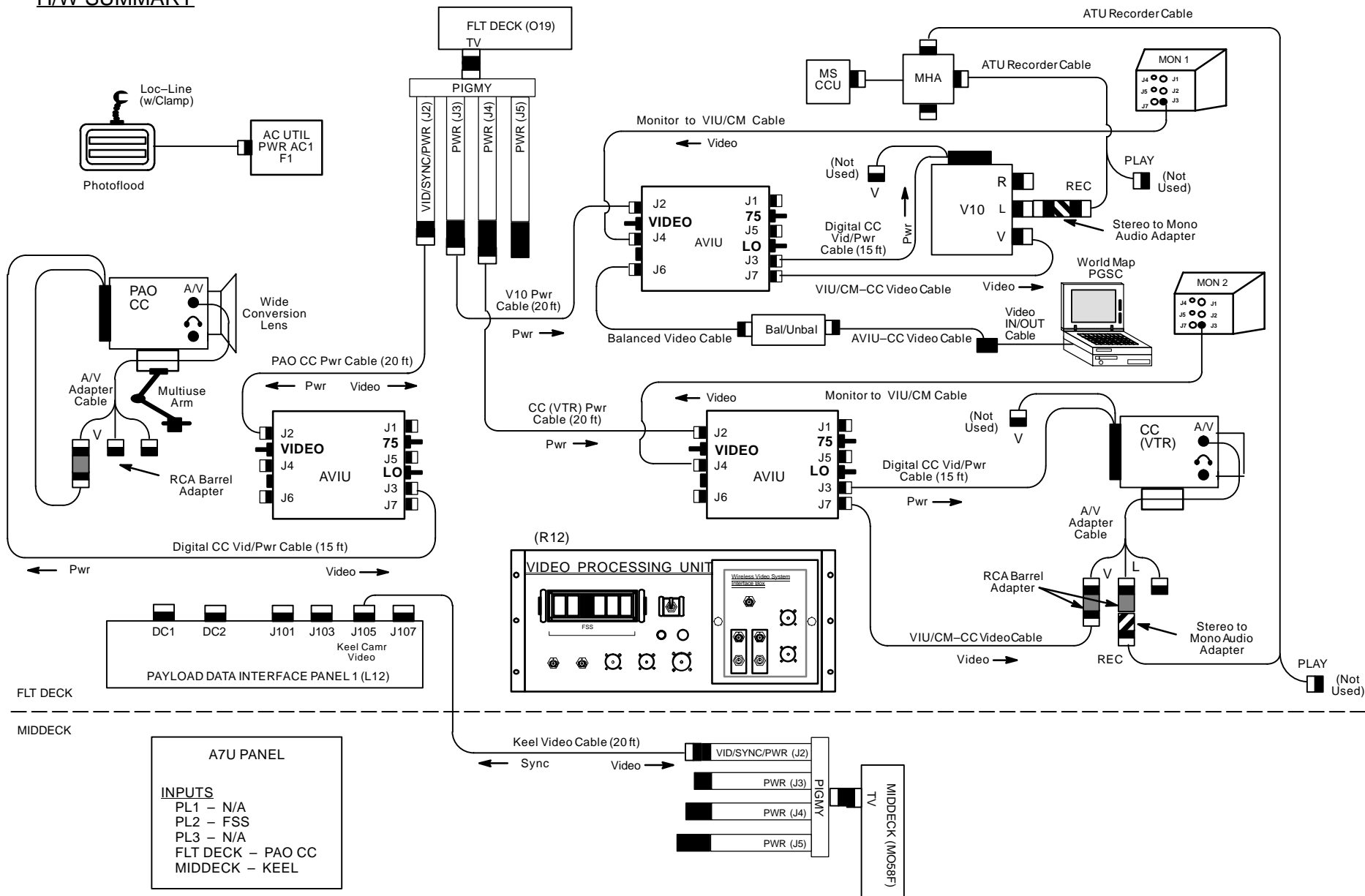
1. TV System
 Go to DEACTIVATION (Cue Card, TV) as reqd

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P/TV17 HST RELEASE

H/W SUMMARY



P/TV17 HST RELEASE (Continued)

SCENE SYNOPSIS

Scene contains procedures for obtaining video, still photos of HGA deployment, HST unberth, deployment

QUICK CHECK

V10		CC (VTR)		PAO CC	
O19	✓TV Pwr – ON	O19	✓TV Pwr – ON	O19	✓TV Pwr – ON
V10	PWR – ON ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – VTR ✓Tape installed DISPLAY pb – Toggle to display tape counter	CC	Mode – CAMERA ✓Tape installed ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK FOCUS – AUTO
				F1	✓AC UTIL PWR AC1 – ON
				Photoflood	ON/OFF – ON
				CC	✓Scene composition, focus
Keel Camr		FSS Camr			
MO58F	✓Keel Video Cable connected to PIGMY J2/Vid/Sync/Pwr	R12U (VPU)	✓Green Jumper – FSS ✓VPU PWR – ON (LED on)		
	✓TV Pwr – ON	L12 (SSP 1)	✓CCTV HTR PWR – ON (tb–gray) SM 211 SSE CONTROL		
L11 (SSP 3)	KEEL CAM ENA – ON		✓CCTV ENA ON – ITEM 3 (*) ✓PWR ON – ITEM 5 (*)		

P/TV17 HST RELEASE (Continued)

SETUP

1. Perform V10 FROM MON 1 (SETUP DATA; V10)
2. Perform CC (VTR) FROM MON 2 (SETUP DATA; CC(VTR))
3. Perform PAO CC (SETUP DATA; PAO CC)
4. Perform KEEL CAMR (SETUP DATA; KEEL CAMR)

R12
(VPU)

5. FSS Camr
Green Jumper – FSS
✓VPU Pwr – ON (LED on)

L12
(SSP 1)

- ✓CCTV HTR PWR – ON (tb-gray)

NOTE

FSS Camr activation performed in HST UNBERTH
(HST DEPLOY, HST UNBERTH)

6. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
7. Perform F5 SHUTTER PRIORITY (SETUP DATA; 35mm NOM)
8. Perform 203 PLB EXPOSURES (SETUP DATA; 70mm NOM)
9. Perform 760 SHUTTER PRIORITY (SETUP DATA; DCS NOM)

|

P/TV17 HST RELEASE (Continued)

OPS

✓	Item # Track #	Rqmts	Still Imagery			Video			Notes
			35mm	70mm	DCS	PLB	CC	Dnlk	
	1.	<u>HGA DEPLOY</u> <ul style="list-style-type: none"> Video of Mast deploy, Dish Slews Still images of fwd latches, gimbal hinge post deployment 			<u>760</u> 80–200mm (400mm)	<u>MUX:</u> <u>D(A).B(C)</u>		PLBK desired	Full length views of each HGA from start of deployment thru Dish Slew completion Frame shots to capture HGA in deployed posn
	2.	<u>HST GRAPPLE, UNBERTH</u> <ul style="list-style-type: none"> Video of HST grapple ops including: <ol style="list-style-type: none"> RMS grapple Umbilical demate (entire travel) Each berthing latch opening HST unberth Still images of each visible berthing latch in open posn 	<u>F5</u> 80–200mm (400mm) ISO 100 CPos			<u>A(D).B.C.</u> <u>WRIST.FSS</u>			
	3.	<u>HST RELEASE</u> <ul style="list-style-type: none"> Video HST release, sep from mnvr to release posn thru 15 min post release including AD opening ops Still images of HST release ops including DCS survey of aft bulkhead concentrating on cooling system rigid conduits 	<u>F5</u> 400mm ISO 100 CPos	<u>203</u> 50mm(110mm) ISO 100 CPos Brkt (1 stop, 3 shot)	<u>760</u> 80–200mm	<u>A.B.C.D.</u> <u>Wrist,</u> <u>Elbow,Keel</u>			

P/TV17 HST RETRIEVE/BERTH (Concluded)

OPS (Concluded)

If operations temporarily suspended, perform DEACTIVATION as reqd
If operations completed, go to DEACTIVATION

DEACTIVATION

1. DCS 760
Exp Mode – P
Pwr – OFF
Flash ON/OFF – ON
Start batt recharge as reqd
2. 35mm F5
Exp Mode – P
Flash ON/OFF – ON
3. TV System
KEEL CAM ENA – OFF

L11
(SSP 3)

NOTE

FSS Camr deactivation performed in HST UNBERTH
(HST DEPLOY, HST UNBERTH)

Go to DEACTIVATION (Cue Card, TV) as reqd

SETUP DATA

	<u>PAGE</u>
35mm NOM	FS 2-4
SPECIAL	FS 2-8
70mm NOM	FS 2-14
SPECIAL	FS 2-16
DCS NOM	FS 2-20
SPECIAL	FS 2-24
V10 FROM MON 1	FS 2-28
CC (VTR) FROM MON 2	FS 2-30
PAO CC	FS 2-32
KEEL CAMR	FS 2-34
CC BATT CHARGING	FS 2-36
DCS BATT CHARGER	FS 2-38

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FS 2-3

P/TV/109/FIN A

35mm NOM

35mm NOM

35mm NOM

F5 PROGRAM w/FLASH

Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – ON
✓Mode – TTL, Matrix
✓Zoom – Auto (no M)
Tilt – Direct

F5 SHUTTER PRIORITY

Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – S
SS – 500
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
✓ISO – DX
✓Camr BKT – Disabled
Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF

35mm NOM (Concluded)

F5 SHUTTER PRIORITY w/AUTO-BRACKETING

Camr Settings

- Pwr – ON
- ✓Batt icon full
- ✓Frame Counter ≥ 1
- Exp Comp – 0.0
- Exp Mode – S
- SS – 500
- AF Area Mode – []
- Meter – Matrix
- Diopter – Adjust
- Film Adv – C_H
- Body Focus Mode – S
- Lens Focus Mode – A
- Aperture – Min, locked
- ✓ISO – DX
- Camr BKT – BKT, 3F 1.0 displayed
- Focus Area – Center, LOCK displayed

Data Back Settings

- ✓Between Frame – YR MO/DY HR:MIN SEC
- ✓Between Frame Data – PRINT displayed

Flash Settings

- ON/OFF – OFF

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35mm SPECIAL

35mm SPECIAL

F5 CREW PHOTO

Lens – 28mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – A
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – Selftimer
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
f/stop – F8
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
Data Back Settings
Between Frame – TIME, F
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – ON
✓Mode – TTL, Matrix
✓Zoom – Auto (no M)
Tilt – Direct
Remote Release – Install
Multiuse Brkt (Clamp)
Focus
Body Focus Mode – M
Frame, Fire

F5 EXPOSURE MATCH

Lens – 28mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
✓CSM – 21-1, AEL
Data Back Settings
Between Frame – TIME, F
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – ON
✓Mode – TTL, Matrix
✓Zoom – Auto (no M)
Tilt – Direct

TECHNIQUE

1. Fill FOV w/Sunlit subject
2. Activate Camr
3. Exposure Lock pb – Depress and hold
Expect values such as 250, F16
4. Focus, Frame, Fire

35mm SPECIAL (Continued)

F5 AURORA/AIRGLOW

Lens – 50mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥ 1
Exp Comp – 0.0
Exp Mode – M
SS – 15"
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – C_H
Body Focus Mode – M
Aperture – Min, locked
f/stop – F1.4
✓ISO – DX
Camr BKT – BKT, 3F 1.0 displayed
✓Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF
Remote Release – Install
Multiuse Brkt (Clamp)
Focus, Frame, Fire, hold for 3 frames

F5 CITY LIGHTS/STARS

Lens – 50mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥ 1
Exp Comp – 0.0
Exp Mode – M
SS – 2"
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – C_H
Body Focus Mode – M
Aperture – Min, locked
f/stop – F1.4
✓ISO – DX
Camr BKT – BKT, 3F 1.0 displayed
✓Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF
Remote Release – Install
Multiuse Brkt (Clamp)
Focus, Frame, Fire, hold for 3 frames

35mm SPECIAL (Continued)

F5 LIGHTNING

Lens – 50mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – M
SS – 8"
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – M
Aperture – Min, locked
f/stop – F1.4
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF
Remote Release – Install
Multiuse Brkt (Clamp)
Focus, Frame, Fire

TECHNIQUE

Fire Camr repeatedly. Luck reqd

F5 MOON

Lens – 400mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – M
SS – 500
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – C_H
Body Focus Mode – S
Lens Focus Mode – M
Aperture – Min, locked
f/stop – F8 (Full Moon)
– F4 (1/2 Moon)
– F2.8 (1/4 Moon)
✓ISO – DX
Camr BKT – BKT, 3F 1.0 displayed
✓Focus Area – Center, LOCK displayed
Data Back Settings
Between Frame – TIME, F
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF
Multiuse Brkt (Clamp)
Focus, Frame, Fire, hold for 3 frames

35mm SPECIAL (Continued)

F5 SILHOUETTE

Lens – 50mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥ 1
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Aperture – Min, locked
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
✓CSM – 21–1, AEL
Data Back Settings
Between Frame – TIME, F
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF

TECHNIQUE

1. Fill FOV w/bright subject
2. Activate Camr
3. Exposure Lock pb – Depress and hold
Expect values such as 250, F8–11
4. Focus, Frame, Fire

F5 SUNRISE/SUNSET

Lens – 400mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥ 1
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – C_H
Body Focus Mode – S
Lens Focus Mode – M
Aperture – Min, locked
✓ISO – DX
✓Focus Area – Center, LOCK displayed
Data Back Settings
Between Frame – TIME, F
✓Between Frame Data – PRINT displayed
AutoBrkt – ON, 0.0 CENTER, 1.0 STEP, 5 FRAME
Flash Settings
ON/OFF – OFF
Focus, Frame, Fire, hold for 5 frames



35mm SPECIAL (Concluded)

F5 SUN STAR EFFECT

Lens – 16mm
Film – ISO 100 CPos
Camr Settings
Pwr – ON
✓Batt icon full
✓Frame Counter ≥1
Exp Comp – 0.0
Exp Mode – A
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – M
Aperture – Min, locked
f/stop – F22
✓ISO – DX
✓Camr BKT – Disabled
✓Focus Area – Center, LOCK displayed
Data Back Settings
✓Between Frame – YR MO/DY HR:MIN SEC
✓Between Frame Data – PRINT displayed
Flash Settings
ON/OFF – OFF
Focus, Frame, Fire

TECHNIQUE

Place Sun w/Earth, orbiter, crewmember, etc, in FOV

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70mm NOM

70mm NOM

203 PLB EXPOSURES

- ✓Yellow IR Filter removed
- ✓Data Module – ON
 - Darkslide – Remove
 - Diopter – Adjust
 - Motor Drive – C
 - Mode – Ab
 - SS – Set at 1 sec
 - Aperture – Adjust for $SS \geq$ lens focal length

203 CVIS EARTH EXPOSURES

- ✓Yellow IR Filter removed
- ✓Data Module – ON
 - Darkslide – Remove
 - Diopter – Adjust
 - Motor Drive – C
 - Mode – Ab
 - SS – Set at 1 sec
 - Aperture – Adjust for SS = 500

203 CIR EARTH EXPOSURES

- ✓Yellow IR Filter installed
- ✓Data Module – ON
 - Darkslide – Remove
 - Diopter – Adjust
 - Motor Drive – C
 - Mode – Ab
 - SS – Set at 1 sec
 - Aperture – Adjust for SS = 500

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70mm SPECIAL**203 MOON**

- Lens – 350mm
- ✓Yellow IR Filter removed
- Film – ISO 100 CPos
- ✓Data Module – ON
- Darkslide – Remove
- Diopter – Adjust
- Motor Drive – C
- Mode – M
- SS – 250
- Aperture – 11 (full Moon)
 - 5.6 (half Moon)
 - 4 (quarter Moon)

NOTE

Manually brkt on both sides of suggested aperture (± 1 stop)

203 SILHOUETTE

- Lens – 110mm(50mm)
- Film – ISO 100 CPos
- ✓Data Module – ON
- Darkslide – Remove
- Diopter – Adjust
- Motor Drive – C
- Mode – Ab
- SS – Set at 1 sec
- Aperture – 8

TECHNIQUE

1. Meter highlight
2. Lock exposure
3. Focus, Frame, Fire

203 SUN/STAR EFFECT

- Lens – 50mm
- Film – ISO 100 CPos
- ✓Data Module – ON
- Darkslide – Remove
- Diopter – Adjust
- Motor Drive – S
- Mode – M
- SS – 500
- Aperture – 8

TECHNIQUE

1. Focus
2. Frame w/Sun near edge of FOV or partially blocked
3. Fire
4. Take 3 more shots at f/11, f/16, f/22

203 IN CABIN

- Lens – 50mm(100mm)
- Film – ISO 100 CPos
- ✓Data Module – ON
- ✓Darkslide – Removed
- Diopter – Adjust
- Motor Drive – C
- Mode – Ab
- SS – Set at 1 sec
- Aperture – Adjust fo SS $\geq 1/60$ sec

70mm SPECIAL (Concluded)

203 IN CABIN w/FLASH

Lens – 50mm
Film – ISO 100 CPos
✓Data Module – ON
✓Darkslide – Removed
Diopter – Adjust
Motor Drive – S
Mode – M
SS – 60
Aperture – 5.6
Flash Settings
ON/OFF – ON
✓ISO – 100 (must be blinking to adjust)
MODE – A
ZOOM – 35mm
Aperture – 5.6
Tilt – Direct

TECHNIQUE

1. Connect Flash to Camr using Nikon/Hasselblad Flash Card
2. ✓Camr,Flash aperture settings same
3. Focus, Frame, Fire

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DCS NOM

760 PROGRAM w/FLASH

- Pwr – ON
- ✓Disk installed
- Rear LCD
 - ✓Batt
 - ✓Frames remaining sufficient
 - ✓White Balance – Flash
- ISO – 100
- ✓BKT disabled
- ✓Focus Area – Center, LOCK displayed
 - Exp Comp – 0.0
 - Exp Mode – P
 - AF Area Mode – []
 - Meter – Matrix
 - Diopter – Adjust
 - Film Adv – S
 - Body Focus Mode – S
 - Lens Focus Mode – A
 - Aperture – Min, locked
- Flash Settings
 - ON/OFF – ON
 - ✓TTL, Matrix
 - ✓Zoom – Auto (no M)
 - Tilt – Direct

760 SHUTTER PRIORITY

- Pwr – ON
- ✓Disk installed
- Rear LCD
 - ✓Batt
 - ✓Frames remaining sufficient
 - ✓White Balance – Flash
- ISO – 100
- ✓BKT disabled
- ✓Focus Area – Center, LOCK displayed
 - Exp Comp – 0.0
 - Exp Mode – S
 - SS – 500
 - AF Area Mode – []
 - Meter – Matrix
 - Diopter – Adjust
 - Film Adv – S
 - Body Focus Mode – S
 - Lens Focus Mode – A
 - Aperture – Min, locked
- Flash Settings
 - ON/OFF – OFF

DCS NOM (Concluded)

760 SHUTTER PRIORITY w/AUTO-BRACKETING

Pwr – ON
✓Disk installed
Rear LCD
✓Batt
✓Frames remaining sufficient
✓White Balance – Flash
ISO – 100
BKT – BKT, 3F 1.0 displayed
✓Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – S
SS – 500
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – C_H
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
Flash Settings
ON/OFF – OFF

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DCS SPECIAL

DCS SPECIAL

760 CREW PHOTO

Lens – 28mm
Pwr – ON
✓Disk installed
Rear LCD
✓Batt
✓Frames remaining sufficient
✓White Balance – Flash
✓ISO – 100
✓BKT – OFF
✓Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – A
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – Selftimer
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
f/stop – 8
Flash Settings
ON/OFF – ON
✓TTL, Matrix
✓Zoom – Auto (no M)
Tilt – Direct
Remote Release – Install
Multiuse Brkt (clamp)
Focus
Body Focus Mode – M
Frame, Fire

760 EXPOSURE MATCH

Lens – 28mm
Pwr – ON
✓Disk installed
Rear LCD
✓Batt
✓Frames remaining sufficient
✓White Balance – Flash
✓ISO – 100
✓BKT disabled
✓Focus Area – Center, LOCK displayed
✓CSM – 21-1, AEL
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
Flash Settings
ON/OFF – ON
✓TTL, Matrix
✓Zoom – Auto (no M)
Tilt – Direct

TECHNIQUE

1. Fill FOV w/Sunlit subject
2. Activate Camr
3. Exposure Lock pb – Depress and hold
Expect values such as 250, F16
4. Focus, Frame, Fire

DCS SPECIAL (Concluded)

760 TV MONITOR

Lens – 50mm
Pwr – ON
✓Disk installed
Rear LCD
✓Batt
✓Frames remaining sufficient
✓White Balance – Flash
✓ISO – 100
✓BKT – Disabled
✓Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – S
SS – 30
AF Area Mode – []
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
Flash Settings
ON/OFF – ON
Focus, Frame, Fire

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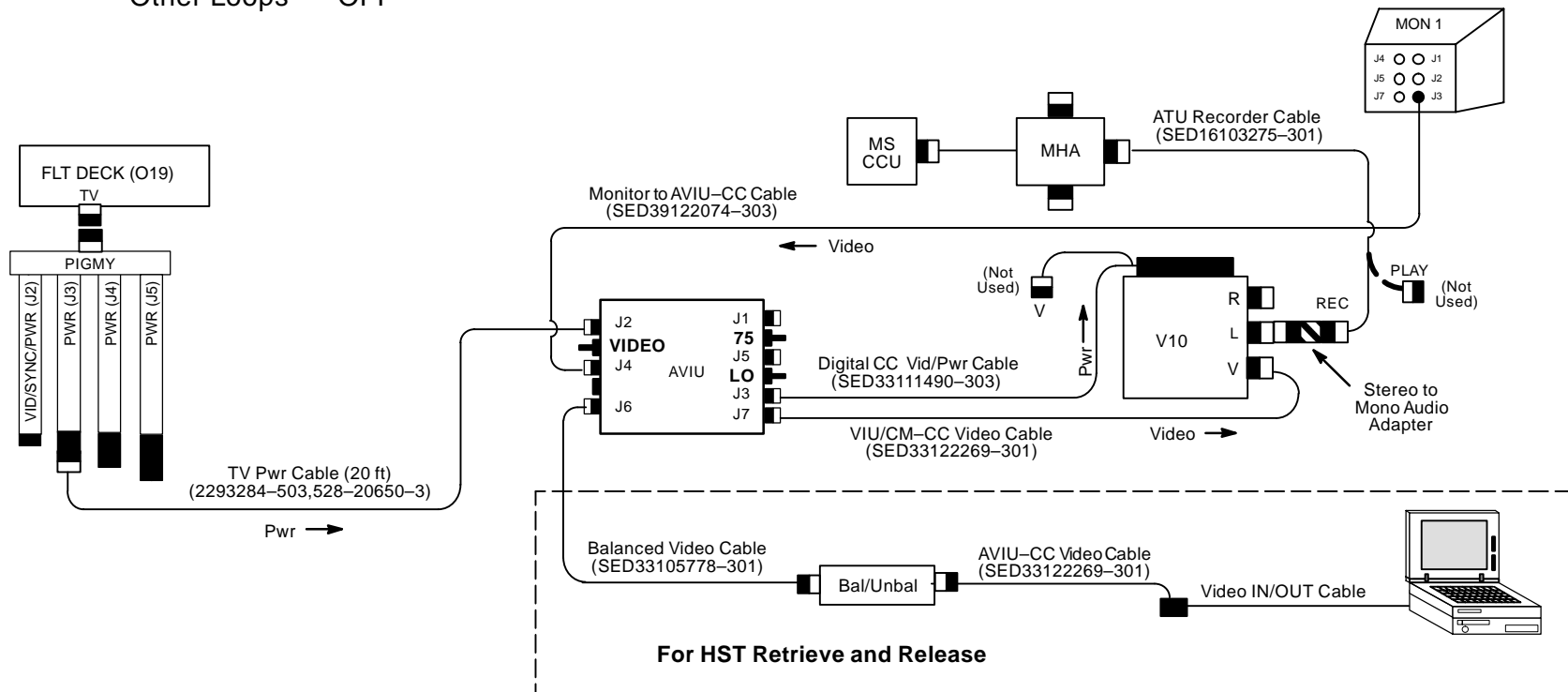
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V10

V10 FROM MON 1

Config H/W per dwg below

- AVIU SYNC/VIDEO – VIDEO
 HI-Z/75 – 75
 PWR SELECT – LO
- O19 ✓TV PWR – ON
- V10 PWR – ON
 Tape – Install
 DISPLAY pb – Toggle to display tape counter
- R10 MS AUD PWR – AUD
 Desired Loops – T/R(RCV), VOL tw – 8
 Other Loops – OFF



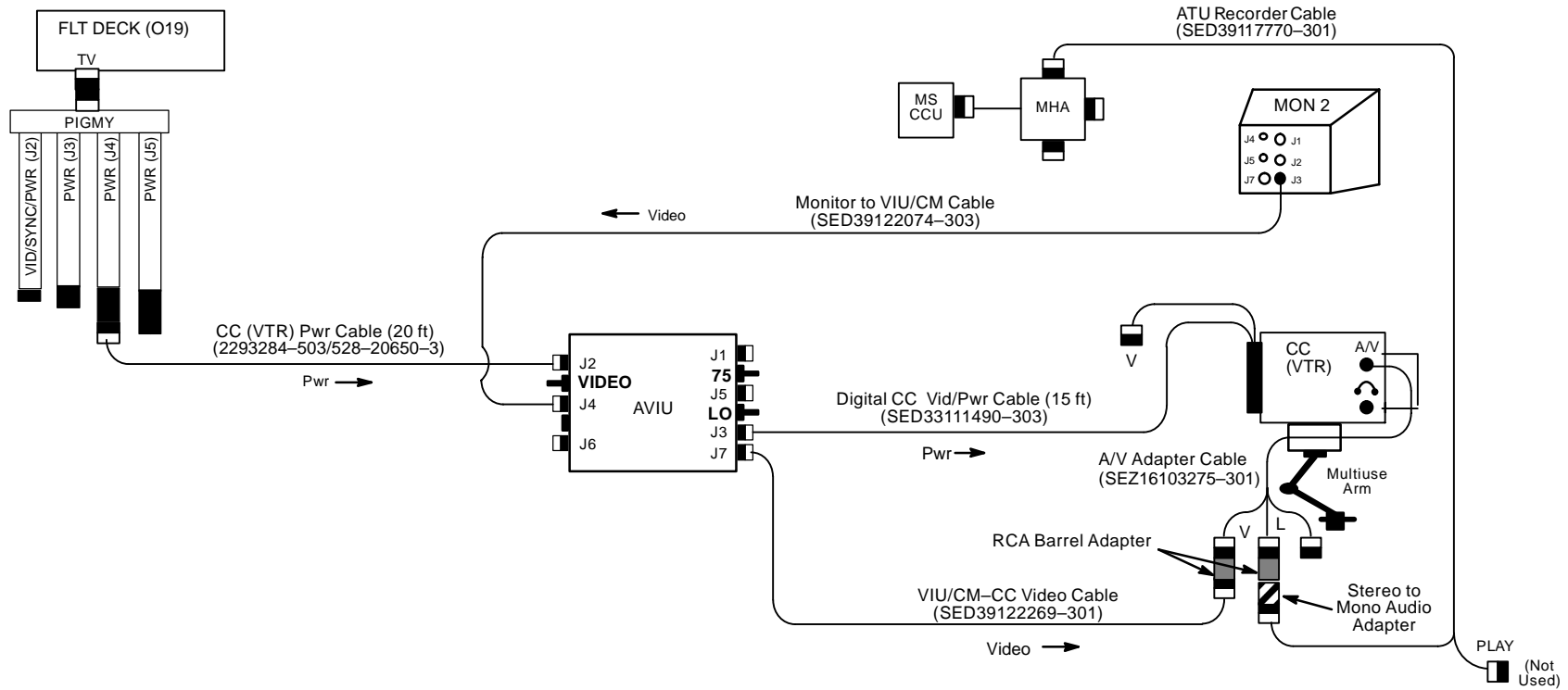
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CC (VTR)

CC (VTR) FROM MON 2

Config H/W per dwg below

- AVIU SYNC/VIDEO – VIDEO
 HI-Z/75 – 75
 PWR SELECT – LO
- O19 ✓TV PWR – ON
- CC Mode – VTR
 Tape – Install
 DISPLAY pb – Toggle to display tape counter



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PAO CC

Config H/W per dwg at right

AVIU SYNC/VIDEO – VIDEO
 HI-Z/75 – 75
 PWR SELECT – LO

O19(MO58F) ✓TV PWR – ON

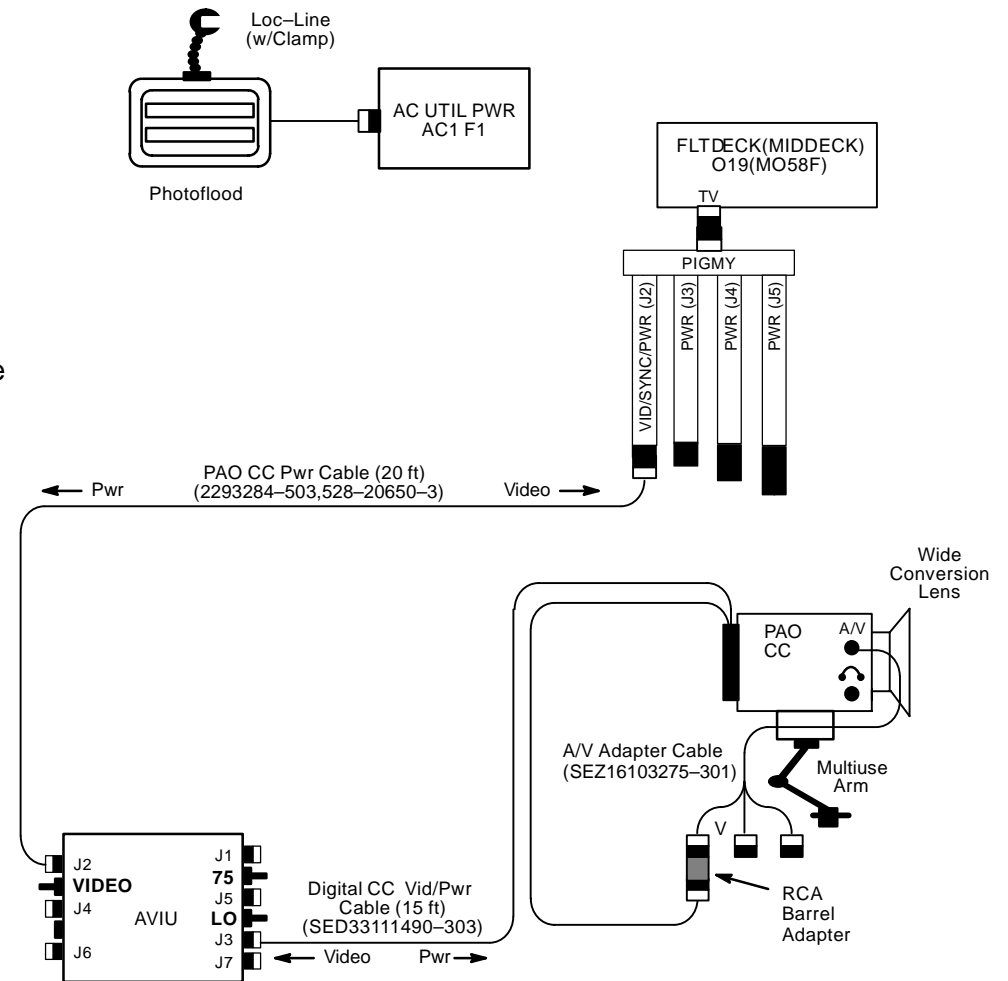
CC ✓Wide Conversion Lens installed
 Mode – CAMERA
 If rec to tape:
 | Tape – Install
 | ✓Viewfinder (LCD) displays STBY
 If live event:
 | Tape – Remove
 | ✓Viewfinder (LCD) displays blinking yellow tape
 Camr Settings
 | ✓AUTO LOCK – AUTO LOCK
 | FOCUS – AUTO
 Multiuse Brkt, Clamp

F1 AC UTIL PWR AC1 – ON

Photoflood ON/OFF – ON
 HI/LO – HI

Cabin Lts Flt Deck – ON
 Lts in FOV – OFF as reqd
 Lt Shades – install as reqd
 Window Shades – install as reqd

CC ✓Scene composition
 Adjust Camr pointing angle for best framing



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KEEL CAMR

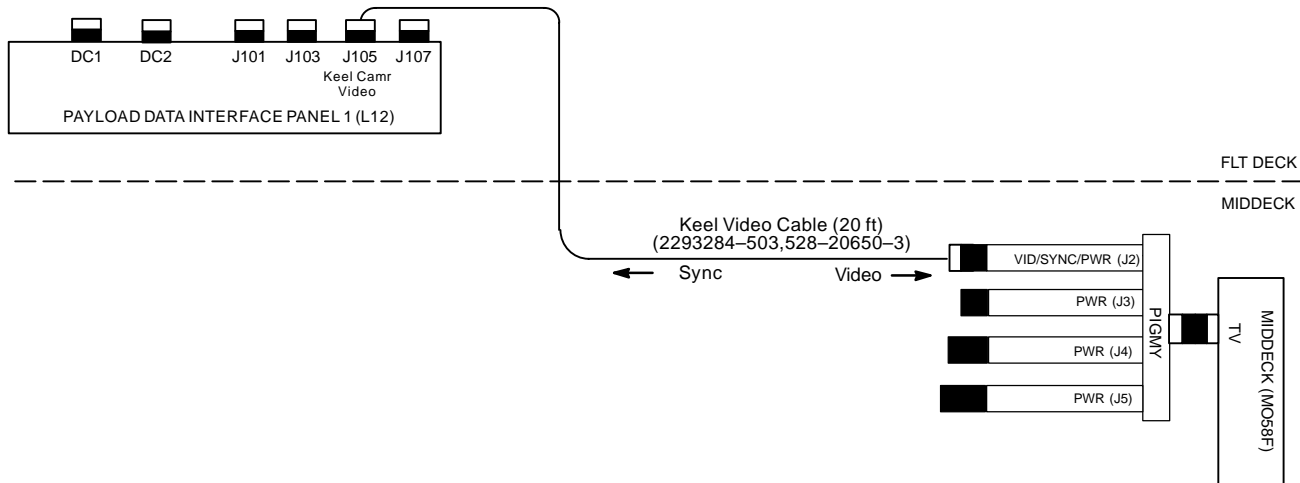
Config Keel Camr
Config H/W per dwg below

MO58F

✓TV Pwr – ON

L11
(SSP 3)

✓cb KEEL CAM PWR (CB3) – cl
✓cb SW PWR 2 (CB1) – cl
✓KEEL CAM HTR/ILLUM – ON
ENA – ON



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CC BATT

CC BATT CHARGING

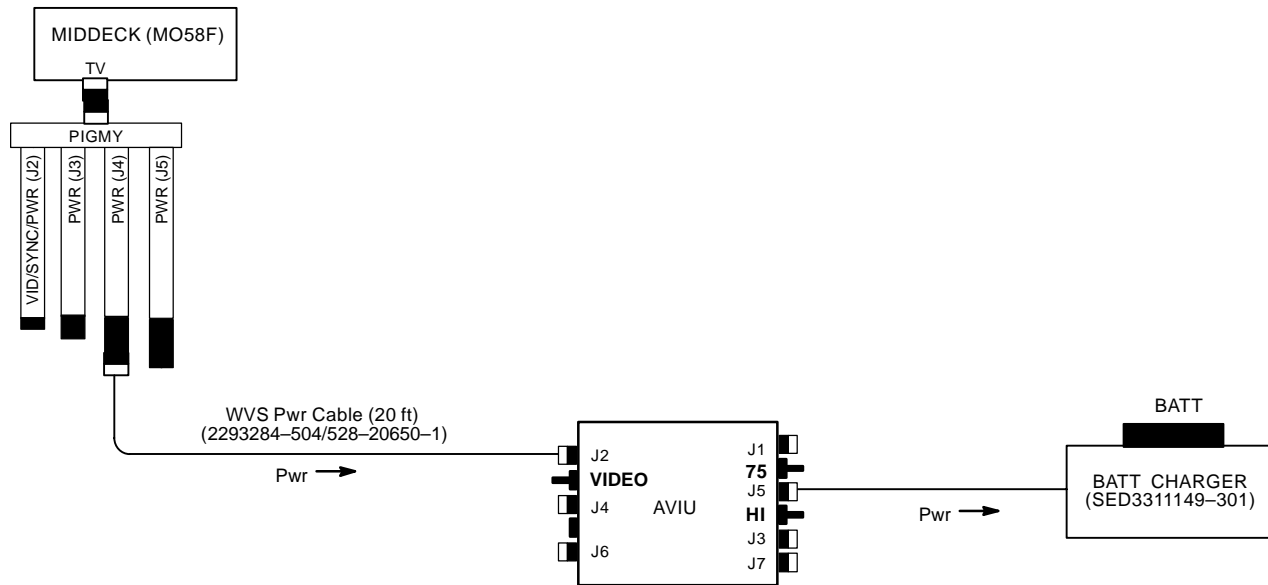
A17 Unstow batt charger
Config H/W per dwg below

AVIU SYNC/VIDEO – SYNC
HI-Z/75 – 75
PWR SELECT – HI

NOTE

When batt charger not in use, remove pwr

MO58F TV PWR – ON

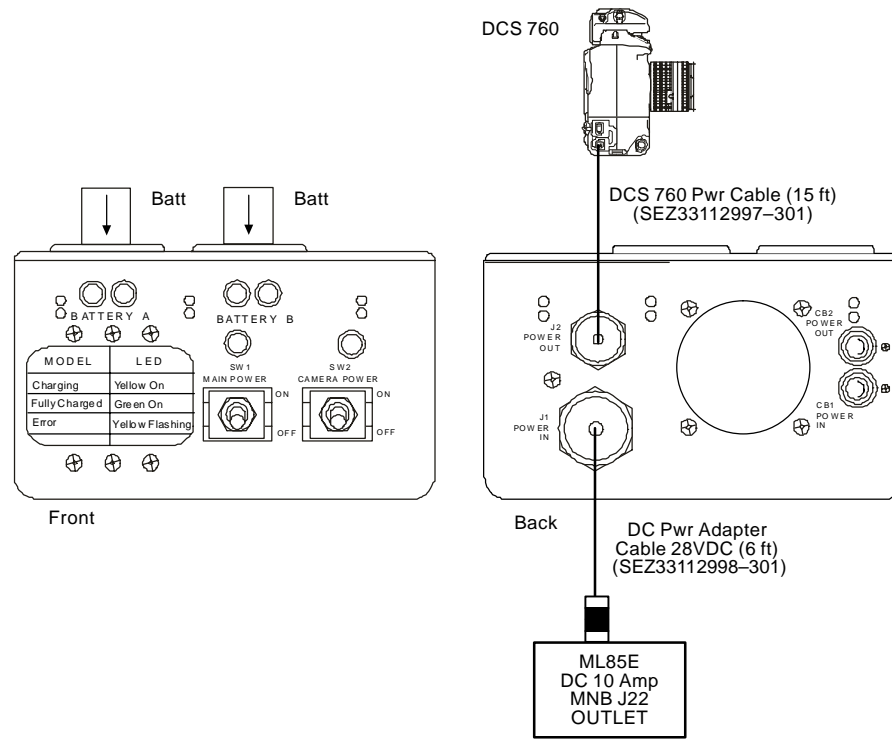


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DCS BATT

DCS BATT CHARGER

1. Config H/W per dwg below (DCS 760 Pwr Cable reqd for direct Camr pwr)
2. DC 10 AMP MNB S4 – ON
3. ✓cb PWR IN (CB1) – IN
4. MAIN PWR – ON (LED on)
5. If Direct Camr Pwr:
✓cb PWR OUT (CB2) – IN
CAMERA PWR – ON (LED on)
6. Insert Batt(s)



REF DATA

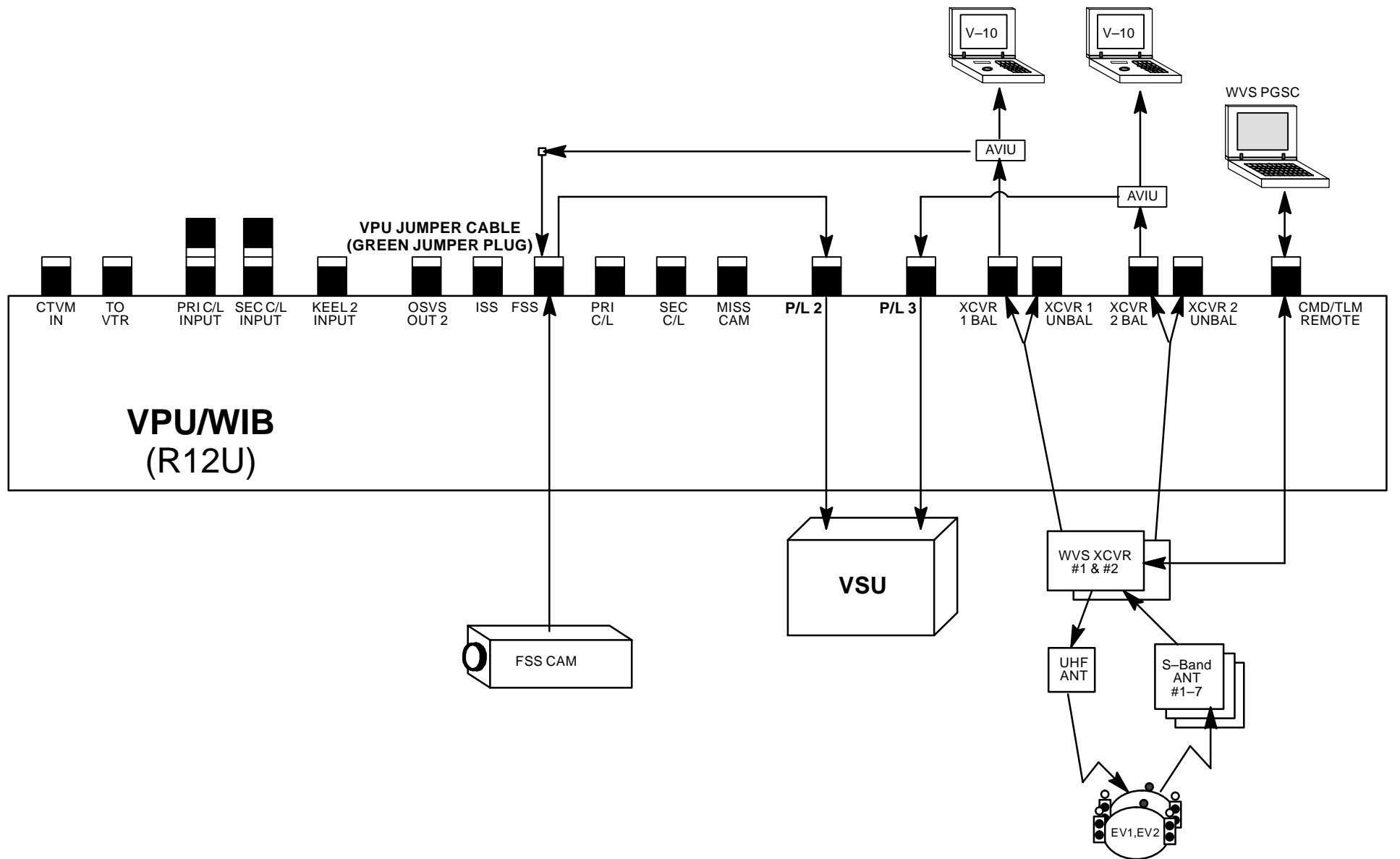
PAGE

VPU/WVS VIDEO ROUTING OVERVIEW	FS 3-3
SM3B VIDEO DNLK RQMTS & PRIORITIES	FS 3-4

REF DATA

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VPU/WVS VIDEO ROUTING OVERVIEW



SM3B VIDEO DNLK RQMTS & PRIORITIES

Recording/ Dnlk Time	Sequence of Events (by FD)	Dnlk Priority by FD	Remarks
FD 1			
00:30	1. SSE Visual Inspection	1	Projects first look at H/W after PLBD open
FD 2			
00:40	1. SSE Checkout	1	Closeup views of carriers using RMS Camr(s)
00:45	2. Config FSS for Berthing	2	Views of FSS mechanisms being positioned/verified for berthing
FD 3			
00:40	1. HST/Orbiter Approach	2	Projects first look at spacecraft
00:10	2. HST/RMS Grapple	8	
00:30	3. HST/RMS Mnvr	7	
00:20	4. FSS/HST Berthing & RMS Release	5	
01:00	5. HST Survey	1	First opportunity to view external HST surfaces (closeup)
00:19	6. SA Slew (90° to 0°)	6	
00:12	7. FSS/HST Positioning (-V3 to -V2)	9	
00:30	8. -V2 SA SDM Retraction	3	
00:12	9. FSS/HST Positioning (-V2 to +V2)	10	
00:30	10. +V2 SA SDM Retraction	4	
00:12	11. FSS/HST Positioning (+V2 to -V3)	11	
02:00	HST Survey (-V3 Overnight Activity)		Conducted during crew sleep

SM3B VIDEO DNLK RQMTS & PRIORITIES (Continued)

Recording/ Dnlk Time	Sequence of Events (by FD)	Dnlk Priority by FD	Remarks
FD 4			
00:07	1. FSS/HST Positioning (-V3 to -V2)	8	
00:15	2. EVA Day 1 Preps	7	
00:15	3. BSP Installation	5	
00:30	4. -SA & DBA EVA Activity	1	Would like as much as feasible of all EVA activity recorder w/selected views of overall installation procedures and all WVS EVA closeout data dlnk'd
00:10	5. PCU Prep EVA Activity	2	
00:20	6. HST Survey (-V2)	3	First opportunity to view -V2 axis up close. Nominally, data collected via ESC
00:40	7. FSS/HST Positioning (-V2 to -V3)	9	
00:07	8. -SA Slew (0° to 90° to 0°)	4	Slew occurs in two separate segments, from 0° to 90°; and then, after batt charge complete back to 0°
00:15	9. EVA Day 1 Closeout Activity	6	
02:00	HST Survey (-V3 Overnight Activity)		Conducted during crew sleep
FD 5			
00:07	1. FSS/HST Positioning (-V3 to +V2)	7	
00:15	2. EVA Day 2 Preps	6	
00:30	3. +SA & DBA EVA Activity	1	Would like as much as feasible of all EVA activity recorder w/selected views of overall installation procedures and all WVS EVA closeout data dlnk'd
00:10	4. RWA EVA Activity	2	
00:20	5. HST Survey (+V2)	3	First opportunity to view +V2 axis up close. Nominally, data collected via ESC
00:15	6. EVA Day 2 Closeout Activity	5	
00:07	7. FSS/HST Positioning (+V2 to -V3)	8	
00:40	8. +SA Slew (0° to 90° to 0°)	4	Slew occurs in two separate segments, from 0° to 90°; and then, after batt charge complete back to 0°
02:00	HST Survey (-V3 Overnight Activity)		Conducted during crew sleep

SM3B VIDEO DNLK RQMTS & PRIORITIES (Continued)

Recording/ Dnlk Time	Sequence of Events (by FD)	Dnlk Priority by FD	Remarks
FD 6			
00:14	1. +SA Slew (0° to +160°)	2	
00:14	2. -SA Slew (0° to +180°)	3	
00:15	3. EVA Day 3 Preps	6	
00:30	4. PCU EVA Activity	1	Would like as much as feasible of all EVA activity recorder w/selected views of overall installation procedures and all WVS EVA closeout data dlnk'd
00:15	5. EVA Day 3 Closeout Activity	5	
00:20	6. ± SA Slew (to 90°)	4	SAs remain at 90° overnight
02:00	HST Survey (-V3 Overnight Activity)		Conducted during crew sleep
FD 7			
00:20	1. ± SA Slew (90° to 0°)	3	
00:07	2. FSS/HST Positioning (-V3 to -V2)	6	
00:15	3. EVA Day 4 Preps	5	
00:30	4. ACS EVA Activity	1	Would like as much as feasible of all EVA activity recorder w/selected views of overall installation procedures and all WVS EVA closeout data dlnk'd
00:20	5. PCU Cleanup EVA Activity	2	
00:15	6. EVA Day 4 Closeout Activity	4	
00:07	7. FSS/HST Positioning (-V2 to +V3)	7	
02:00	HST Survey (+V3 Overnight Activity)		ESC data collect via crew, and video data collected during crew sleep

SM3B VIDEO DNLK RQMTS & PRIORITIES (Concluded)

Recording/ Dnlk Time	Sequence of Events (by FD)	Dnlk Priority by FD	Remarks
FD 8			
00:10	1. HST Reboost	3	HST motion
00:07	2. FSS/HST Positioning (+V3 to +V2)	6	
00:15	3. EVA Day 5 Preps	5	
00:30	4. NCS EVA Activity	1	Would like as much as feasible of all EVA activity recorder w/selected views of overall installation procedures and all WVS EVA closeout data dnlk'd
00:30	5. Final EVA Closeout Activity	2	Views of completed EVA. Project may request specific views
00:20	6. HGA Deploy & Slew	4	
00:07	7. FSS/HST Positioning (+V2 to -V3)	7	
02:00	HST Survey (-V3 Overnight Activity)		Conducted during crew sleep. Sufficient data may have already been collected
FD 9			
00:20	1. SA Slew (0° to 90°)	4	
00:30	2. FSS/HST Unberth & Grapple	2	
00:25	3. RMS Mnvr	3	
00:20	4. HST Release	1	Of particular interest will be Opening of AD
00:20	5. FSS Stow	5	FSS stowage activity
FD 10 & FD 11			
00:20	View SSE	1	Overview of SSE each day

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CUE CARD CONFIGURATION

	<u>PAGE</u>
TV	FS CC 4-3
PLAYBACK	FS CC 4-5
ET PHOTO (Front)	FS CC 4-7
(OPTIONAL) (Back of ET PHOTO)	FS CC 4-7
FILM ALLOCATIONS	FS CC 4-8
WVS	FS CC 4-10
DVCAM TAPE LOG	FS CC 4-12
STS-109 SDM RETRACTION OVERLAY	FS CC 4-14

CUE CARDS

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TOP

HOOK
VELCRO

TV

ACTIVATION

- A3 MON 1(2) PWR – ON (LED ON)
- A7 ✓ TV DNLK – ENA
- PWR CNTL – PNL
- CONTR UNIT – MNA(B)
- CNTL – CMD (wait 10 sec for system initialization)

OPERATION

Auto Ops (Auto Exposure)

NOTE

✓ MCC has commanded sync config

- A7 TV CAMR PWR A(B,C,D,RMS) – ON (tb–ON)
- VID OUT pb – MON 1(2)
- IN pb – As reqd
- If CTVC:
 - ALC pb – press
 - AVG pb – press
- If ITVC:
 - If MAN GAIN pb not illuminated:
 - TV CAMR PWR A(B,C,D,RMS) – OFF, wait 10 sec, then ON
 - Repeat until MAN GAIN pb illuminated
 - LT LEVEL pb – press
 - DAY(NIGHT) pb – press
 - ALC pb – press
 - AVG pb – press
- If FSS MLA:
 - ALC AVG pb – press
 - GAMMA NORM pb – press

Repeat for other Camrs as reqd

Dnlk Ops

Coordinate dnlk and sync config w/MCC
Config audio as reqd
On MCC GO:

- A7 VID OUT pb – DNLK
- IN pb – As reqd

DEACTIVATION

If Illuminator ON:
Refer to Illuminator Ops and perform Illuminator OFF

- A7 TV CAMR PWR A(B,C,D,RMS) – OFF (tb–OFF)
- PWR CNTL – PNL
- CONTR UNIT – OFF
- CNTL – CMD
- A3 MON 1(2) PWR – OFF

Manual Ops – CTVC/ITVC (Manual Exposure)

CAUTION

DO NOT LEAVE CAMRS UNATTENDED
IN MANUAL MODE. DIRECT SUNLIGHT
WILL DAMAGE CAMRS

Manual Exposure ON

- A7 MAN GAIN pb – press
- 0(+12,+24) dB pb – press
- CAMR CMD IRIS – OP/CL

Return to Auto Exposure

- ALC pb – press
- AVG pb – press

Manual Ops – FSS MLA (Manual Exposure)

Semi-Manual Exposure ON

- A7 CAMR CMD IRIS – OP/CL

Full Manual Exposure ON

- A7 CAMR CMD IRIS – OP/CL
- GAMMA WHT STRCH(BLK STRCH) pb – press

Return to Auto Exposure

- ALC AVG (PEAK,NORM) pb – press

MUX Ops

NOTE

Although dnlk/rcd is in color, MON
will display MUX in B&W

- A7 VID OUT pb – Desired MON
- IN pb – MUX 1(2)
- OUT pb – MUX 1(2)L
- IN pb – As reqd
- OUT pb – MUX 1(2)R
- IN pb – As reqd

P/TV-1a/109/O/B

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FS CC 4-3

FAB USE ONLY

P/TV/109/FIN A

TOP
BACK OF 'TV'

HOOK
VELCRO

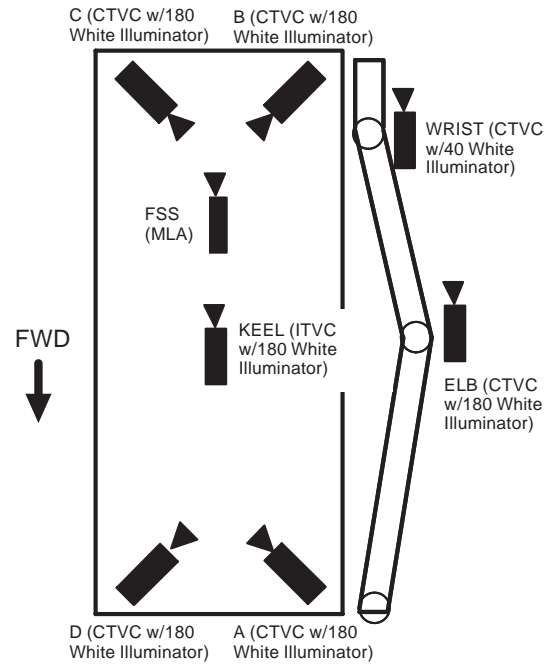
Illuminator Ops

Illuminator ON

SSP 3 | If Keel Illuminator
 | ✓ cb KEEL CAM PWR (CB3) - cl
 | ✓ SW PWR 2 (CB1) - cl
 | KEEL CAM HTR/ILLUM - OFF, then ON
 R14:D(E) | If Wrist Illuminator:
 | ✓ cb TV RMS CAMR/PAN-TILT - cl
 | ✓ CAMR HTR - cl
 | - op, then cl
 | If A(B,C,D,ELB) Illuminator:
 | ✓ cb TV A(B,C,D,RMS) CAMR/PAN-TILT - cl
 | ✓ PAN-TILT HTR - cl
 | - op, then cl

Illuminator OFF

SSP 3 | If Keel Illuminator
 | KEEL CAM HTR/ILLUM - OFF, then ON
 R14:D(E) | If Wrist Illuminator:
 | cb TV RMS CAMR HTR - op, then cl
 | If A(B,C,D,ELB) Illuminator:
 | cb TV A(B,C,D,RMS) PAN-TILT HTR - op, then cl



P/TV-1b/109/O/C

(reduced copy)

FS CC 4-4

FAB USE ONLY

P/TV/109/FIN A

TOP

HOOK
VELCRO

PLAYBACK

ACTIVATION

PD100(V10) Setup per diagram (back of cue card)
A7 Perform ACTIVATION (Cue Card, TV), as reqd
O19(MO58F) ✓ TV PWR – ON
PD100(V10) MODE – VTR (PWR–ON)

OPERATIONS

PLBK or DNLK VIDEO

O19(MO58F) If PIGMY, ✓VID/SYNC/PWR connection
PD100(V10) Install tape, if reqd

CCU If audio reqd:
ATU If MHA, COMM PWR – ON
PWR – AUD
Desired Loops – T/R
Other Loops – RCV(OFF)
XMIT/ICOM Mode – VOX/VOX
VOX SENS – MAX

PD100(V10) Speaker Vol Max

A7 VID OUT pb – Desired MON
IN pb – FLT DECK(KEEL/MIDDECK)
PD100(V10) VTR pb – REW(FF) to cue tape

IF DNLK

✓MCC has commanded async config
A7 ✓TV DNLK – ENA
VID OUT pb – DNLK
IN pb – FLT DECK(KEEL/MIDDECK)

PD100(V10) VTR pb – PLAY
✓PLAY indication and tape counter incrementing

If PLBK(DNLK) complete:
| VTR pb – PAUSE
If PD100(V10) ops complete, go to DEACTIVATION

DEACTIVATION

PD100(V10) VTR pb – STOP
Remove, mark, stow tape as reqd
MODE – OFF (PWR–ON)
ATU Reconfig as desired
O19(MO58F) TV PWR – OFF, as reqd
Go to DEACTIVATION (Cue Card, TV), as reqd

P/TV–2a/109/O/B

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FS CC 4–5

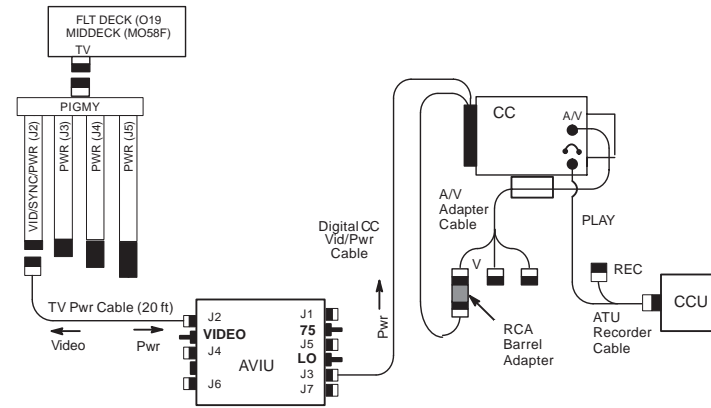
FAB USE ONLY

P/TV/109/FIN A,1

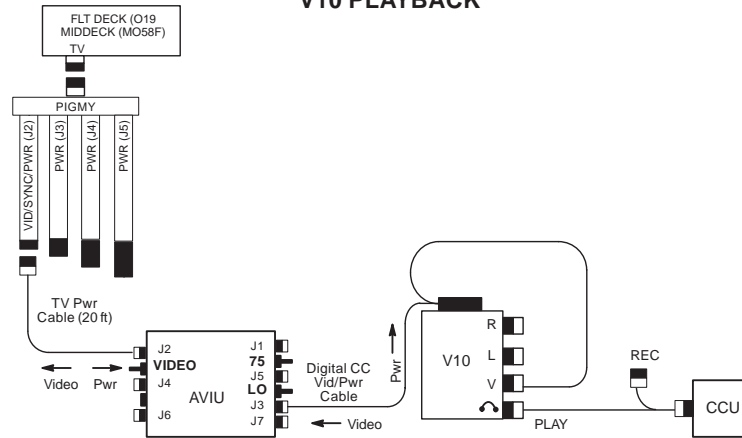
TOP
BACK OF 'PLAYBACK'

HOOK
VELCRO

PD100 PLAYBACK



V10 PLAYBACK



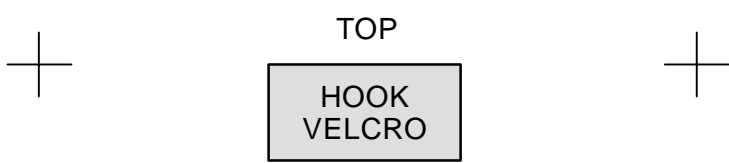
P/TV-2b/109/O/B

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FS CC 4-6

FAB USE ONLY

P/TV/109/FIN A



ET PHOTO

35mm 35mm

CAMR – F5 w/400mm lens

LENS CAPS – REMOVE

BODY CAP – REMOVE

MOUNT LENS TO BODY

LENS SETTINGS

- ✓LENS APERTURE RING – MIN, LOCKED
- ✓LENS FOCUS MODE – M

CAMR SETTINGS

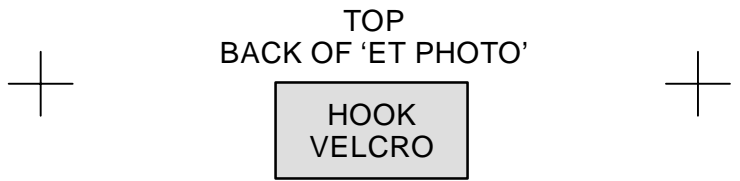
- PWR SW – ON
- ✓EXP MODE – M
 - ✓SS – 500
 - ✓F/STOP – 5.6
- DIOPTER – ADJUST
- ✓FILM ADV DIAL – S

DATA BACK SETTINGS

- ✓BETWEEN FRAME – YR:MO:DY:HH:MM:SS
- ✓BETWEEN FRAME 'PRINT' DISPLAYED

CRITICAL FOCUS REQD EACH FRAME

TAKE ONE SHOT EVERY 10 SEC



**ET PHOTO
(OPTIONAL)**

PD100 PD100

INSTALL BATT (REMOVE KAPTON TAPE)

LENS CAP – REMOVE, CLIP

MODE – CAMERA

DIOPTER – ADJUST (BELOW VIEWFINDER)

✓VIEWFINDER DISPLAYS STBY

CAMR SETTINGS

- FOCUS – INFINITY
- OPEN LCD
- ✓LCD DISPLAYS ▲
- AUTO LOCK – CENTER
- SHUTTER SPEED pb – PRESS
- CONTROL tw – 1000
- EXPOSURE pb – PRESS
- CONTROL tw – F5.6
- CLOSE LCD

ZOOM – WIDE, THEN TIGHT

START RECORDING

✓VIEWFINDER DISPLAYS REC

IF TANK EXPOSURE POOR:
CONTROL tw – ADJUST AS REQD



FAB USE ONLY



FS CC 4-7

P/TV/109/FIN A

TOP

FILM ALLOCATIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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P/TV-4a/109/O/C

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TOP
BACK OF 'FILM ALLOCATIONS'

HOOK
VELCRO



FAB USE ONLY

(reduced copy)
FS CC 4-9

P/TV-4b/109/O/A



P/TV/109/FIN A

TOP

HOOK
VELCRO

WVS

HOOK
VELCRO

CAMR ADJUSTMENTS

Adjust Brightness

Coarse Adjustment

Select Page – RF Camera
Lens Iris Control – Close/Open

Fine Adjustment

Select Page – RF Camera
Electronic Shutter – Manual
BRIGHTNESS – Dec/Inc
(# to right: 100 = brightest; 0 = darkest)

Dark Subject

Select Page – RF Camera
Automatic Gain Control – Enabled
(Disabled preferred)

Pwrdrn

For all lens (three) on each RF Camera Assy:
Lens Iris Control – Close until view black

Sel RF Camr 1,2 – None (black "OFF")
Select Page – XCVR
Transceiver 1(2) CMD Power – OFF
(black CMD PWR:LVL-"OFF:Min")
Sel File → Exit

V10 STOP pb – Press
Mark, stow tapes
POWER – OFF

A7 WIRELESS VIDEO POWER – OFF

Signal Problems

✓MCC/ISS for FGB Komparus xmtr status
(potential interference)
Select Page – RF Camera
S-Band Level – Maximum

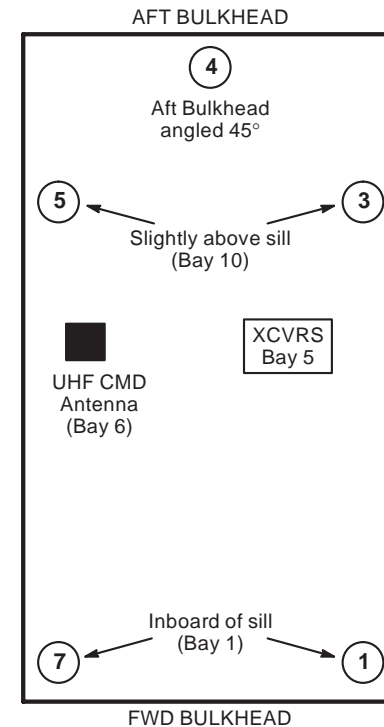
If no improvement:
Select Page – XCVR
IF – Narrow
If video acceptable, continue nominal ops

If still no improvement:
Antenna – Manual
Sel desired antenna
If video acceptable:
IF – Wide
Select Page – RF Camera
S-Band Level – Dynamic
Select Page – XCVR
Manually sel antenna as EV crewmember
changes location

If still no improvement:
Antenna – Auto
Select Page – RF Camera
Power (of other EMU TV) – MUTE
If video acceptable:
S-Band Level – Dynamic
Select Page – XCVR
IF – Wide
Select Page – RF Camera
Alternately mute EMU TVs to acquire video

If still no improvement:
Return to original config:
Power (of muted EMU TV) – ON
S-Band Level – Dynamic
Select Page – XCVR
IF – Wide
✓MCC

ANTENNA LOCATIONS



P/TV-5a/109/O/A

(reduced copy)

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P/TV/109/FIN A

HOOK
VELCRO

HOOK
VELCRO

ALERT MSG TROUBLESHOOTING

STATIC XCVR

Condition: No comm between PGSC & PLB XCVR

- 1. ✓Cable connection between WIB & PGSC
- A7 2. WIRELESS VIDEO POWER – OFF, wait 10 sec, ON
- If no joy:
- PGSC 3. Sel 'Start' > 'Shut Down' > 'Restart the computer?' > 'Yes'
When reboot complete:
Sel SHUTTLE APPS icon > WVS icon
Sel 'YES' at 'RESTORE TO PREVIOUS SETTINGS' window
RF Camera page will appear
- If still no joy:
- 4. ✓MCC

STATIC RF CAMERA

Condition: No telemetry and video received by PLB XCVR from EMU TV

- EMU 1. ✓EMU TV Pwr pb pressed (green LED)
- If no joy:
- PGSC 2. ✓Correct RF Camera selected via pulldown menu
✓RF Camera (both) – ON (green "ON")
If not ON,
Select Page – RF Camera
Under Advanced Controls, Power (both) – ON
- If still no joy:
- 3. ✓CMD PWR:LVL – green "ON:Min" for XCVR 1(2)
If not ON,
Select Page – XCVR
Transceiver 1(2) CMD Power – ON
(green CMD PWR:LVL – "ON:Min")
- If still no joy:
- 4. RF Camera (of static EMU TV) – sel "None" via pulldown menu, then sel original EMU TV
- If still no joy:
- EMU 5. EMU TV Pwr pb (of static EMU TV) – press (no LED), then press again (green LED)
- If still no joy:
- 6. ✓MCC

BAD CAMERA ID

Condition: Mismatch between EMU TV Camera ID and software camera ID

- PGSC 1. Sel RF Camera 1,2 – None
Sel File > Assign Camera ID
✓Camera IDs match data under CAMR ID ASSIGNMENT
If not a match,
Highlight entry, then sel 'Delete Entry' option
Perform CAMR ID ASSIGNMENT
Sel RF Camera 1,2 – EVA crewmembers
- If still no joy:
- 2. ✓MCC

TEMP ALERT (blue text)

Condition: EMU TV –35 °C to –30 °C OR 80 °C to 85 °C range
PLB XCVR –40 °C to –35 °C OR 80 °C to 85 °C range

- Select Page – Telemetry
- Identify component w/temperature alert (blue text)
- ✓MCC

TEMP CAUTION (yellow text)

Condition: EMU TV < –35 °C OR > 85 °C
PLB XCVR < –40 °C OR > 85 °C

- Select Page – Telemetry
- Identify component w/temperature alert (yellow text)
- ✓MCC

CAMR ID ASSIGNMENT

- Sel File → Assign Camr ID
- ✓All EV crewmembers listed as options on pulldown 'Label' menu under CAMERA ID SETUP

- If label entry reqd:
Type label into space next to "Add Label" icon
Sel "Add Label" icon to add to listing

Camr ID Data		
Camr Address	6	9
Serial Number	1004	1006
Label	EV1	EV2

- Under CAMERA ID SETUP:
Camera Address – As reqd via left/right arrows
Serial Number – As reqd via left/right arrows
Label – As reqd via pulldown menu
"In Use" Box – Check via single click
Sel "Save Entry" icon to right of Camr ID table (top)
- ✓Data entry visible in Camr ID table

Sel OK

P/TV–5b/109/O/D

(reduced copy)

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TOP

HOOK
VELCRO

HOOK
VELCRO

DVCAM TAPE LOG

Tape #	GMT	Notes	Tape #	GMT	Notes

NOTE: Four (4) copies of this card reqd for flight

P/TV-6a/109/O/B

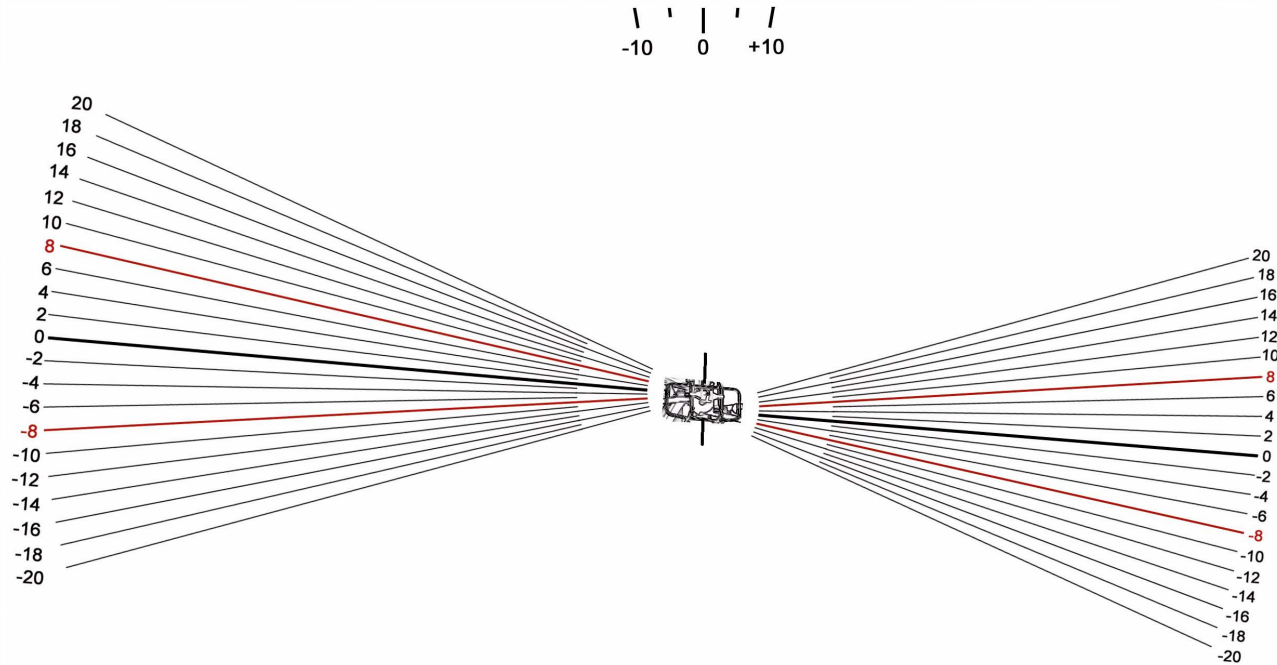
(reduced copy)
FS CC 4-12

FAB USE ONLY

P/TV/109/FIN A

Fabricate as a Transparency

STS-109 SDM RETRACTION OVERLAY (10-22-01)



Align and rotate overlay
to match EVA handrail.
Measure is in degrees from flat.

Acceptable Deflection Limits

Dynamic : +/-2 deg
Static (one bistem): +/-8 deg

+/-V2 forward
Camera D
Nominal HFOV = 74
Underscan: ON

P/TV-7a/109/O/A

(reduced copy)

FS CC 4-14

NOTE

Replace this page with four (4) pieces of blue
K-10 stock in crew copies only

NOTE

Replace this page with four (4) pieces of blue
K-10 stock in crew copies only



PHOTO/TV CHECKLIST

STS
109