

# Photo/TV Checklist

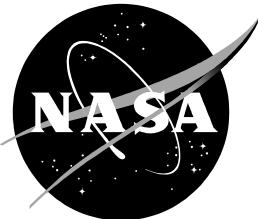
**STS-117**

**Mission Operations Directorate  
Operations Division**

**Final  
November 29, 2006**

National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas



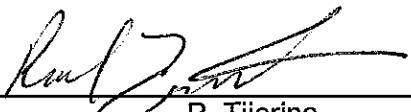


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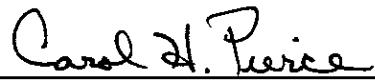
**STS-117 PHOTO/TV CHECKLIST**

FINAL  
November 29, 2006

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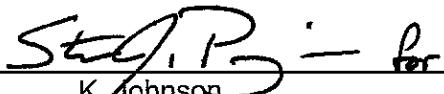


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## STS-117 PHOTO/TV CHECKLIST

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† – 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).....	CC 23-3	P/TV-1a/117/O/B	
(Back).....	CC 23-4	P/TV-1b/117/O/B	
PLAYBACK			
(Front).....	CC 23-5	P/TV-2a/117/O/B	
(Back).....	CC 23-6	P/TV-2b/117/O/B	
ET PHOTO			
(Front).....	CC 23-7	P/TV-3a/117/O/A	
(Back) .....	CC 23-7	P/TV-3b/117/O/A	
MEDIA ALLOCATIONS			
(Front).....	CC 23-8	P/TV-4a/117/O/B	
(Back).....	CC 23-9	P/TV-4b/117/O/B	
WVS			
(Front).....	CC 23-10	P/TV-5a/117/O/A	
(Back) .....	CC 23-11	P/TV-5b/117/O/A	
PLBD VTR RECORDING (Not Being Flown)			
(Front).....	CC 23-12	P/TV-6a/117/O/A	
(Back) .....	CC 23-13	P/TV-6b/117/O/A	
LDRI/ITVC			
(Front).....	CC 23-14	P/TV-7a/117/O/A	
(Back) .....	CC 23-15	P/TV-7b/117/O/B	
LCS			
(Front).....	CC 23-16	P/TV-8a/117/O/B	
(Back) .....	CC 23-17	P/TV-8b/117/O/B	
IDC			
(Front).....	CC 23-18	P/TV-9a/117/O/B	
(Back) .....	CC 23-19	P/TV-9b/117/O/B	
VIDEO SETUP			
(Front).....	CC 23-20	P/TV-10a/117/O/A	
(Back) .....	CC 23-21	P/TV-10b/117/O/A	

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## SCENES

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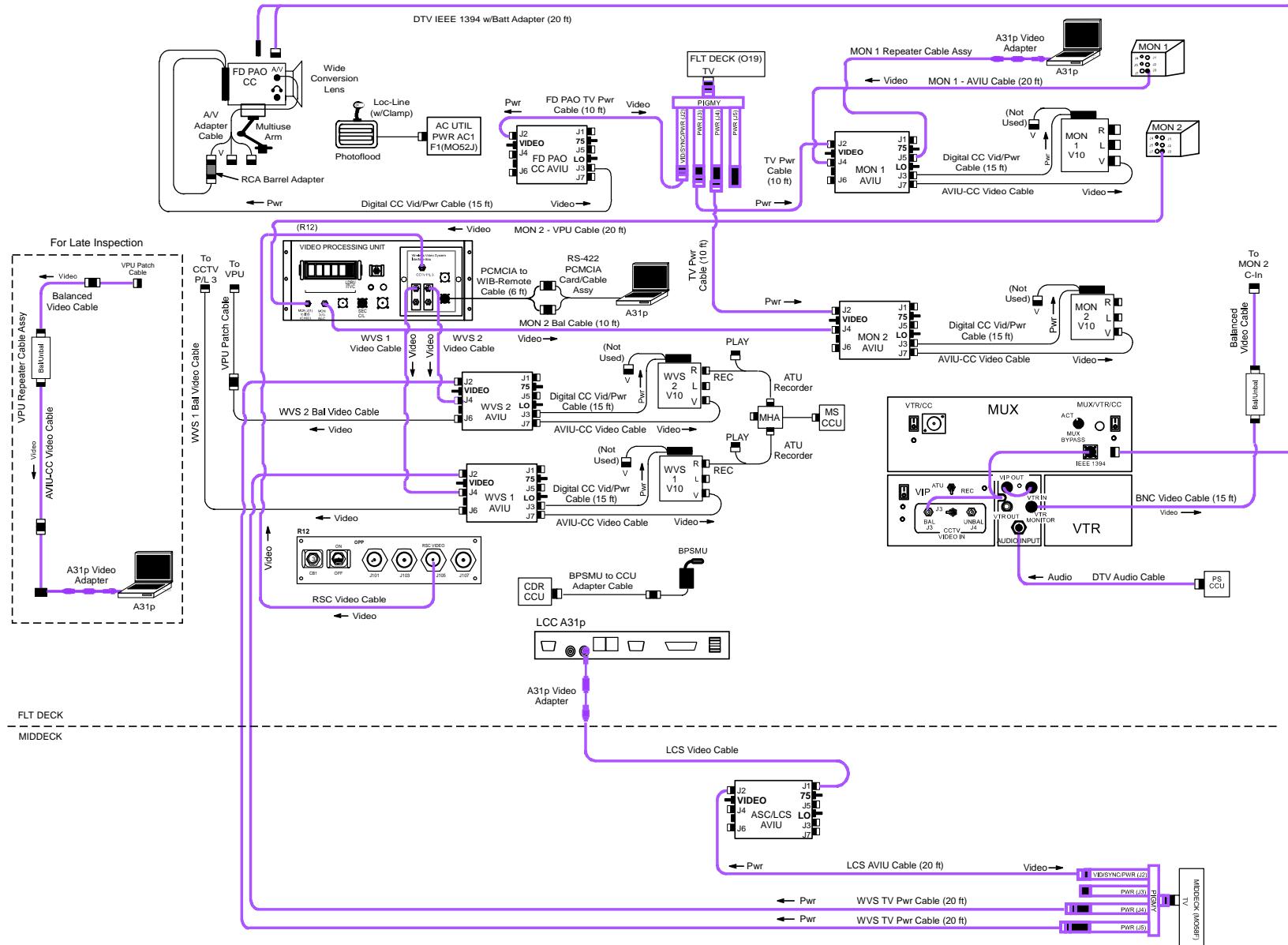
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# P/TV01 VIDEO SETUP

## P/TV01 VIDEO SETUP

### H/W SUMMARY



## P/TV01 VIDEO SETUP (Concluded)

### SCENE SYNOPSIS

Scene contains procedures for documenting Video Setup

### SETUP

#### NOTE

Steps 1-8 minimum rqmt for FD2 OBSS TPS inspection

L10:A1

1. Disconnect Pigmy J5 TV Pwr Cable from Ascent AVIU
2. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
3. Perform SETUP (DTV)
4. Perform V10 FROM MON 1 (SONY V10)
5. Perform V10 FROM MON 2 (SONY V10)
6. √RSC Video Cable connected between R12/OPP-RSC Video and R12/VPU-CCTV PL3
7. Perform ANALOG PAO CC (SONY PD100) for Flt Deck

#### NOTE

For inspection, AVIU must be pwrd  
prior to LCC A31p startup

Middeck  
Flt Deck

8. LCS Video Cable Connection  
Connect end of LCS Video Cable to ASC/LCS CC AVIU J1  
Connect other end of LCS Video Cable (A31p Video Adapter) to LCC A31p Video Out port
9. Perform WVS INITIAL SETUP w/o ERCAs (WVS)

MF57C

10. Unstow, set up BPSMU w/BPSMU to CCU Adapter Cable at CDR CCU
11. For Late Inspection Viewing on A31p:  
Perform A31p VIDEO CONVERTER (Portable Monitors) for ISS video source

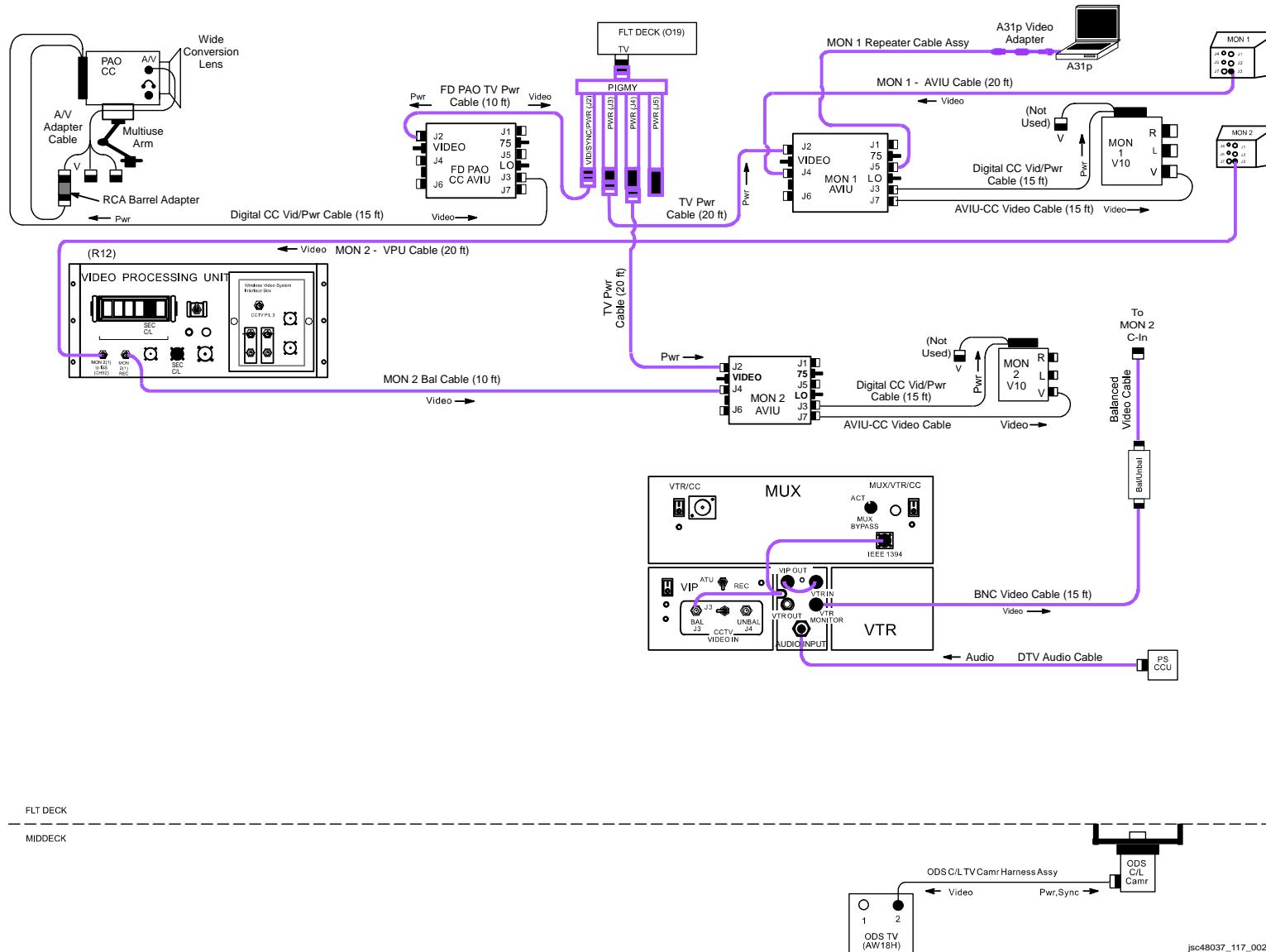
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# P/TV02 DOCK

## P/TV02 DOCK

### H/W SUMMARY



## P/TV02 DOCK (Continued)

### SCENE SYNOPSIS

Scene contains procedures for obtaining video,still photos of ISS rndz,docking

### QUICK CHECK

V10 (two)		PAO CC	
O19	✓TV PWR – ON	O19	✓TV PWR – ON
R12 (VPU)	✓VPU PWR – ON (LED on)	CC	PWR – CAMERA Tape – Install ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO
V10	PWR – ON Tape – Install DISPLAY pb – Toggle to display tape counter		✓Scene composition, focus
C/L Camr			
C/L Camr	✓SSF/STS sw – STS	L10 (MUX) (VIP) (VTR)	✓VTR/CC PWR – on (LED on) If dnlk, MUX/VTR/CC PWR – on (LED on) PWR – on (LED on) ✓ON/STANDBY LED – green ✓Tape installed
R12 (VPU)	✓Green Jumper – SEC C/L ✓SEC C/L Cap installed ✓VPU PWR – ON (LED on)		
L12 (SSP 2)	C/L CAM PWR – SEC ON	MON 2	SOURCE – C

## P/TV02 DOCK (Continued)

### SETUP

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform CCTV CONFIG FOR DOCKING/UNDOCKING (RNDZ, RNDZ TOOLS)
5. Perform SETUP (DTV)
6. Perform ANALOG PAO CC (SONY PD100)
7. ✓C/L CAMR INSTALL (CENTERLINE CAMR) performed
8. Perform 760 SHUTTER PRIORITY (DCS 760)
9. Perform 760 PROGRAM w/FLASH (DCS 760)

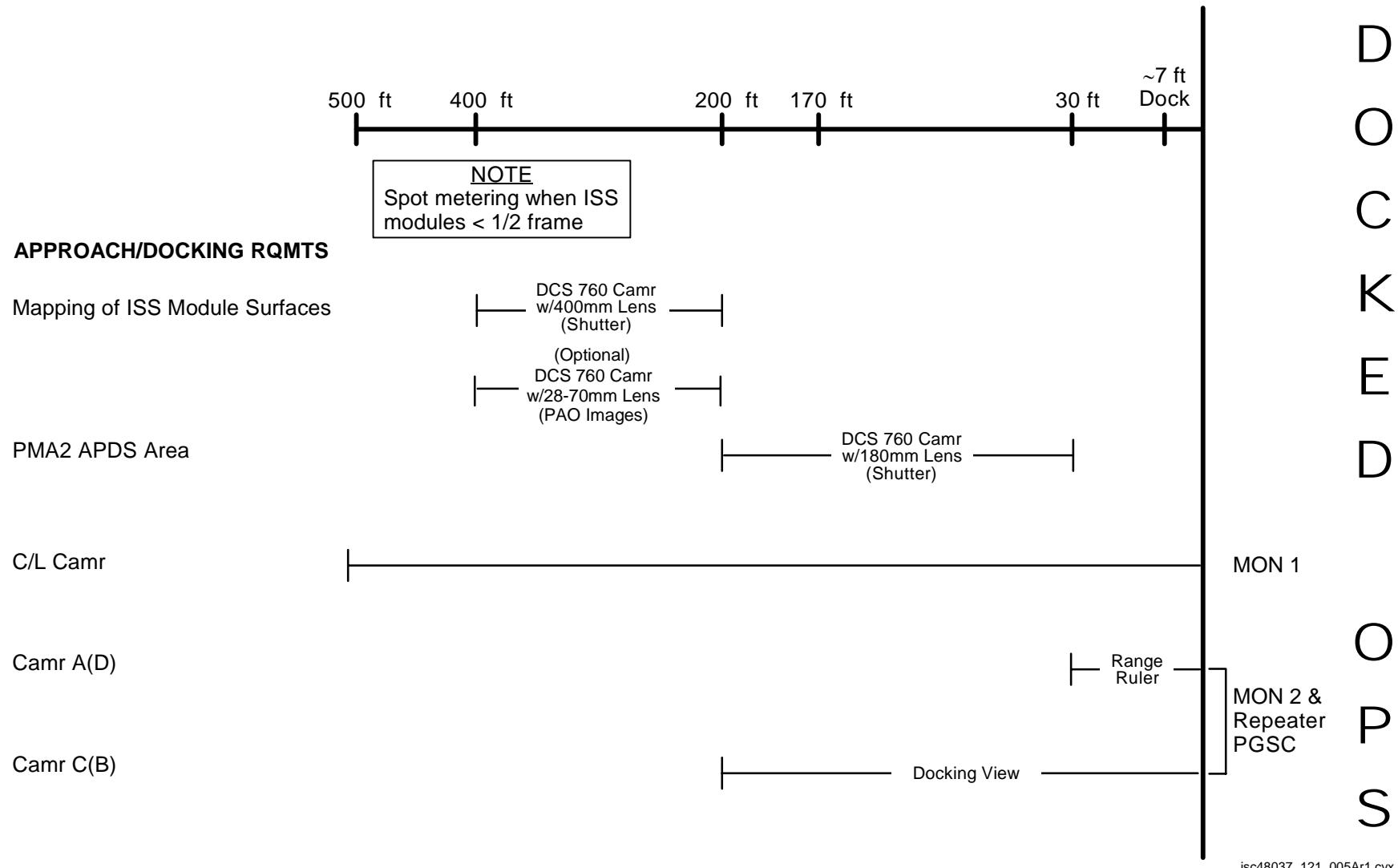
## P/TV02 DOCK (Continued)

### OPS

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	PAO COVERAGE	760 (Program) 28-70mm If exterior: Flash ON/OFF – OFF	As desired	PD100 Tape installed	LIVE (If avail)	Plan for end of day crew choice video, DCS
	2. 13A-2	RENDEZVOUS <ul style="list-style-type: none"> <li>• Overall</li> <li>• Closeup</li> <li>• Damage</li> <li>• Deterioration</li> </ul>	760 (Shutter) 400mm(180mm) ISO 100 Flash ON/OFF – OFF	A(B,C,D)	PD100 As desired		Map ISS surfaces w/10% overlap
	3. 13A-4	DOCK <ul style="list-style-type: none"> <li>• Docking Targets</li> <li>• Mating Surfaces</li> <li>• Planar, Hemispherical Retroreflector</li> </ul>	760 (Shutter) 400mm(180mm) ISO 100 Flash ON/OFF – OFF	C/L Per RNDZ  A(D) Per RNDZ  C(B) Docking view	PD100 As desired		Rcd video thru hard dock Continually ✓focus sharpness

## P/TV02 DOCK (Continued)

OPS (Continued)



jsc48037\_121\_005Ar1.csv

## P/TV02 DOCK (Concluded)

### OPS (Concluded)

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

### DEACTIVATION

1. DCS 760
  - ✓Exp Mode – P
  - Film Adv – S
  - Pwr – OFF
  - Flash ON/OFF – ON
  - Start batt recharge as reqd
2. TV System
  - ✓Green Jumper – SEC C/L
  - ✓SEC C/L Cap installed
  - ✓VPU PWR – ON (LED on)
  - A7      VID OUT MON 1 pb – push
  - IN PL2(VPU) pb – push
  - L12 (SSP 2)  
ODS      CAMR CMD IRIS – CL
  - C/L CAM PWR – OFF
  - Remove, stow C/L Camr, Harness Assy, Bridge
  - Go to DEACTIVATION (Cue Card, TV) as reqd

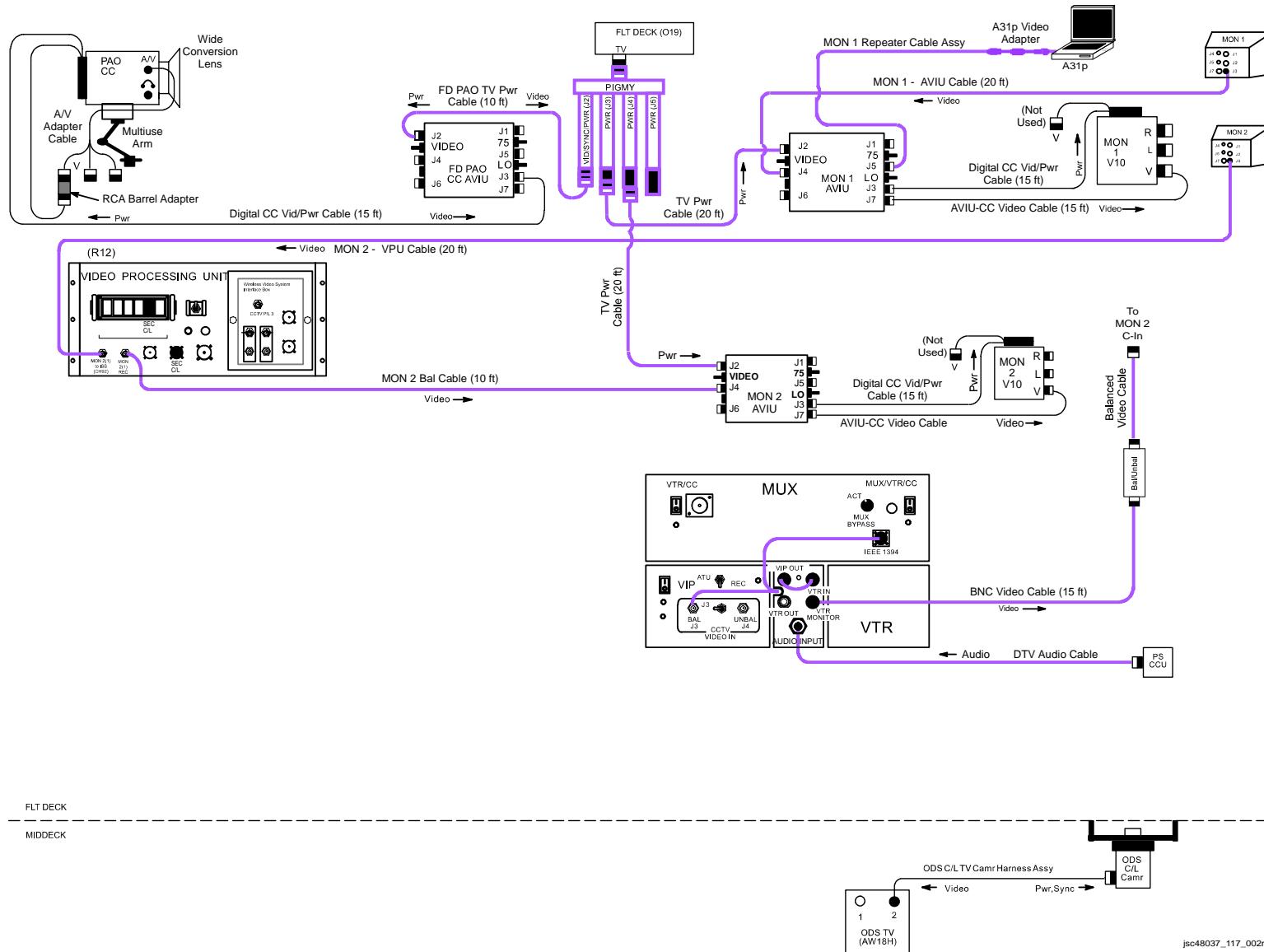
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# P/TV03 UNDOCK

## P/TV03 UNDOCK

### H/W SUMMARY



## P/TV03 UNDOCK (Continued)

### SCENE SYNOPSIS

Scene contains procedures for obtaining video,still photos of ISS undocking,flyaround

### QUICK CHECK

V10 (two)		PAO CC	
O19	✓TV PWR – ON	O19	✓TV PWR – ON
R12 (VPU)	✓VPU PWR – ON (LED on)	CC	PWR – CAMERA Tape – Install ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO
V10	PWR – ON Tape – Install DISPLAY pb – Toggle to display tape counter		✓Scene composition, focus
C/L Camr			
C/L Camr	✓SSF/STS sw – STS	L10 (MUX) (VIP) (VTR)	✓VTR/CC PWR – on (LED on) If dnlk, MUX/VTR/CC PWR – on (LED on) PWR – on (LED on) ✓ON/STANDBY LED – green ✓Tape installed
R12 (VPU)	✓Green Jumper – SEC C/L ✓SEC C/L Cap installed ✓VPU PWR – ON (LED on)		
L12 (SSP 2)	C/L CAM PWR – SEC ON	MON 2	SOURCE –C

## P/TV03 UNDOCK (Continued)

### SETUP

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform CCTV CONFIG FOR DOCKING/UNDOCKING (RNDZ, RNDZ TOOLS)
5. Zero PTU Angles (If not previously set up by MCC)

If Night Undock:

A7

Perform ILLUMINATOR OPS (Cue Card, TV) for Camr B

VID OUT MON 1(2) pb – push  
IN B pb – push

CAMR CMD ZOOM – Full zoom out

PAN,TILT – Center Camr A in FOV  
ZOOM – Full zoom in  
PAN/TILT – LO RATE  
PAN,TILT – Refine placement of Camr A in FOV  
PAN/TILT – RESET

If Daylight Undock:

Perform ILLUMINATOR OPS (Cue Card, TV) for Camr C

VID OUT MON 1(2) pb – push  
IN C pb – push

CAMR CMD ZOOM – Full zoom out

PAN,TILT – Center Camr D in FOV  
ZOOM – Full zoom in  
PAN/TILT – LO RATE  
PAN,TILT – Refine placement of Camr D in FOV  
PAN/TILT – RESET

6. Perform SETUP (DTV)
7. Perform ANALOG PAO CC (SONY PD100)
8. ✓C/L CAMR INSTALL (CENTERLINE CAMR), steps 1,2 performed
9. Perform 760 SHUTTER PRIORITY (DCS 760)
10. Perform 760 PROGRAM w/FLASH (DCS 760), as reqd

## P/TV03 UNDOCK (Continued)

### OPS

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	PAO COVERAGE	760 (Program) 28-70mm If exterior: Flash ON/OFF – OFF	As desired	PD100 Tape installed	LIVE (If avail)	Plan for end of day crew choice video, DCS
	2. 13A-5	UNDOCK AND FLYAROUND <ul style="list-style-type: none"> <li>• Docking Target</li> <li>• Mating Surfaces</li> <li>• Planar Retroreflector</li> <li>• Surfaces</li> <li>• Solar Panels</li> <li>• Handrails</li> <li>• SVS Targets</li> <li>• MISSE</li> <li>• SM Thrusters</li> </ul> S0/S1, S3/S4, P1, P3/P4, P5, and P6 Truss <ul style="list-style-type: none"> <li>• Radiators/ Baseplates</li> <li>• SAWs</li> </ul>	760 (Shutter) 180mm(400mm) ISO 100 Flash ON/OFF – OFF	A(D) Per RNDZ  C/L Docking tgt & PAO view		Map ISS surfaces w/10% overlap	

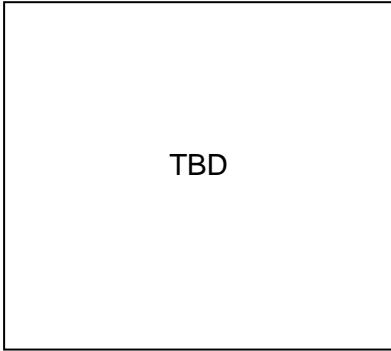
## P/TV03 UNDOCK (Continued)

### OPS (Continued)

√	Item # Track #	Rqmts	Still Imagery	Video			Notes	
			DCS	PLB	CC	Dnlk		
3. 13A-3	MOTION DURING UNDOCK			FOR ORBITAL DAYLIGHT UNDOCKING:  ✓Camr TBD Illuminator on  TBD  PAN: TBD TILT: TBD FOV: TBD  Actual FOV: _____  • Focus on Port SAW Mast Cap • Frame FOV as shown	TBD			Do not track during undock  Gnd will set up Camr view if Ku avail  Begin recording at least 5 min prior to undock  During undock, do not adjust Camr pan(tilt). Allow SAW tip to leave FOV  When array leaves FOV, recording no longer needed  ✓B(C) Illum on
				✓Camr TBD Illuminator on  TBD  PAN: TBD TILT: TBD FOV: TBD  Actual FOV: _____  • Focus on Stbd SAW Mast Cap • Frame FOV as shown	TBD			

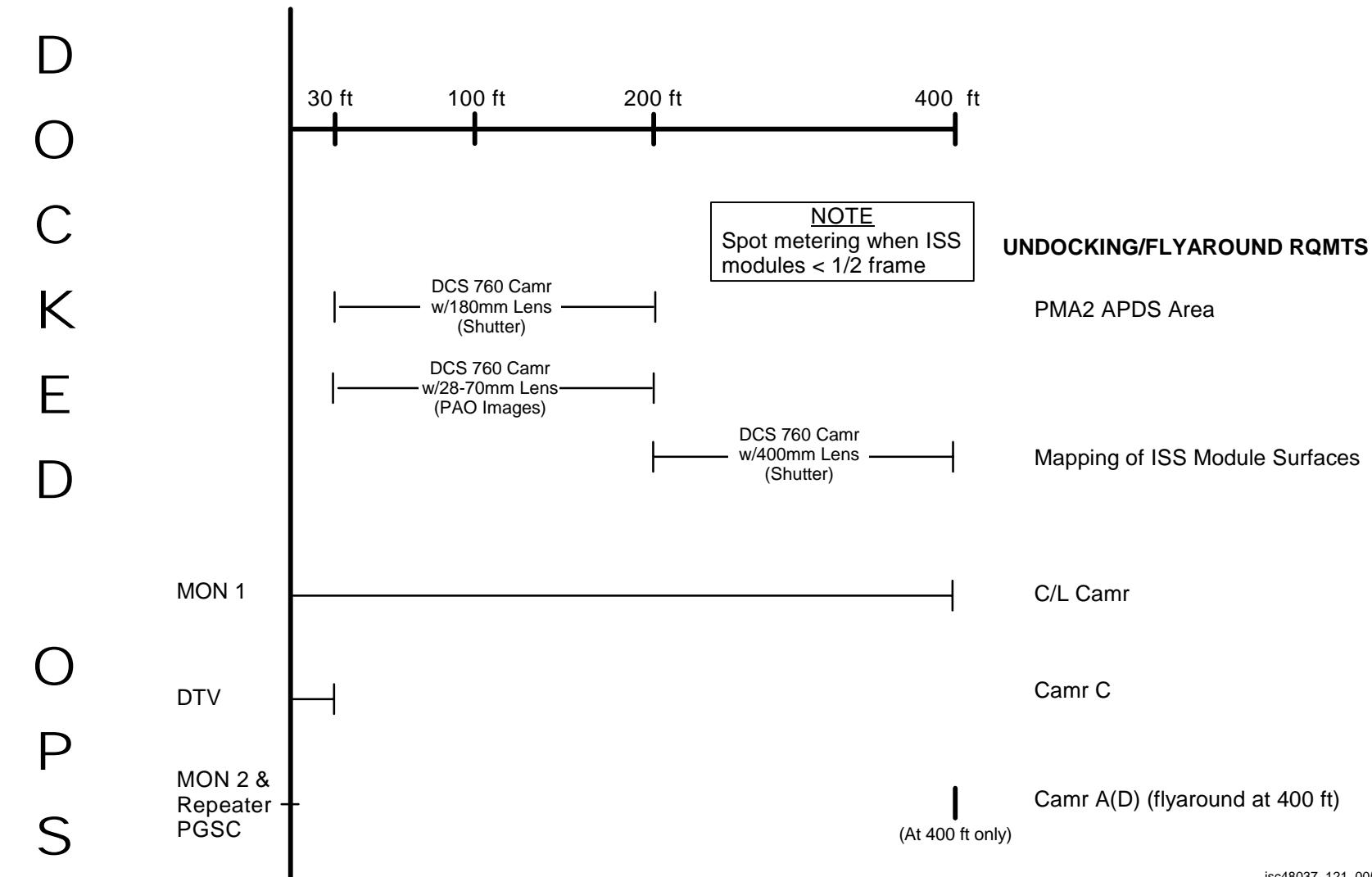
## P/TV03 UNDOCK (Continued)

### OPS (Continued)

√	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	4. 13A-3	SAW TIP DURING UNDOCK		<p>FOR ORBITAL NIGHT UNDOCKING:</p> <p>✓Camr TBD Illuminator on</p> <p>TBD</p> <p>PAN: TBD TILT: TBD FOV: TBD</p> <p>Actual FOV: _____</p> <ul style="list-style-type: none"> <li>• Focus on Port SAW Mast Cap</li> <li>• Frame FOV as shown</li> </ul> 			<p>Do not track during undock</p> <p>Gnd will set up Camr view if Ku avail</p> <p>Begin recording at least 5 min prior to undock</p> <p>During undock, do not adjust Camr pan(tilt). Allow SAW tip to leave FOV</p> <p>When array leaves FOV, recording no longer needed</p> <p>✓B Illum on</p>

## P/TV03 UNDOCK (Continued)

### OPS (Continued)



jsc48037\_121\_005Br1.csv

## P/TV03 UNDOCK (Concluded)

### OPS (Concluded)

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

### DEACTIVATION

1. DCS 760  
✓Exp Mode – P  
Film Adv – S  
Pwr – OFF  
Flash ON/OFF – ON  
Start batt recharge as reqd
2. TV System  
R12 (VPU)      ✓Green Jumper – SEC C/L  
                  ✓SEC C/L Cap installed  
                  ✓VPU PWR – ON (LED on)  
A7                VID OUT MON 1 pb – push  
                  IN PL2(VPU) pb – push  
                  CAMR CMD IRIS – CL  
L12 (SSP 2)     C/L CAM PWR – OFF  
ODS              Remove, stow C/L Camr, Harness Assy

Mark first MON 2 tape as "PV During Undock"  
Go to DEACTIVATION (Cue Card, TV) as reqd

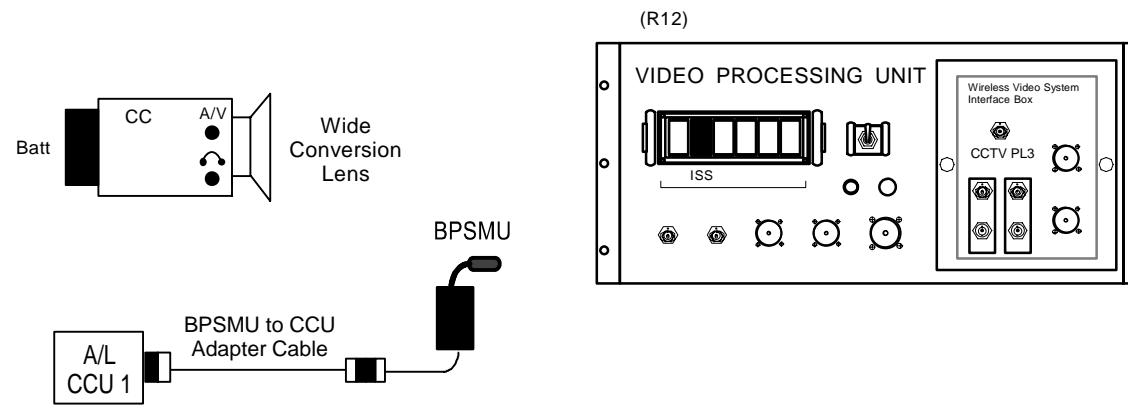
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## P/TV04 INGRESS/EGRESS

### H/W SUMMARY

#### INGRESS TV CONFIG



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## P/TV04 INGRESS/EGRESS (Continued)

### SCENE SYNOPSIS

Scene contains procedures for documenting ISS ingress/egress w/video and still photos

### QUICK CHECK

	INGRESS CC	ISS VIDEO
CC	✓Batt installed PWR – CAMERA Tape – Install ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO  ✓Scene composition,focus	R12 (VPU)  ✓Green Jumper – ISS ✓VPU PWR – ON (LED on)

### VIDEO/PHOTO SETUP

1. Config ISS Video  
R12 (VPU)      Perform ACTIVATION (Cue Card, TV) for DNLK OPS of ISS signal  
                  Green Jumper – ISS  
                  ✓VPU PWR – ON (LED on)
2. Perform Handheld CC SETUP  
A7              VID OUT DNLK pb – push  
                  IN PL2(VPU) pb – push
  
- A17              Acquire two batts, one for CC and one spare  
                  Install Wide Conversion lens
  
- CC              Batt Install  
                  PWR – CAMERA  
                  Tape – Install  
                  ✓Viewfinder (LCD) displays STBY  
                  Camr Settings  
                  ✓AUTO LOCK – AUTO LOCK  
                  ✓FOCUS – AUTO  
                  ✓Audio Muting Plug removed

## P/TV04 INGRESS/EGRESS (Concluded)

### VIDEO/PHOTO SETUP (Concluded)

3. Relocate BPSMU w/BPSMU CCU Adapter to A/L CCU 1
4. Perform 760 PROGRAM w/FLASH (DCS 760)

### OPS

√	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	Hatch Opening, Ingress	<u>760</u> 28-70mm		<u>PD100</u>	LIVE (if avail)	
	2. 13A-3	Hatch Closing, Egress	<u>760</u> 28-70mm		<u>PD100</u>	LIVE (if avail)	

If OPS temporarily suspended, perform DEACTIVATION as reqd

If OPS completed, go to DEACTIVATION

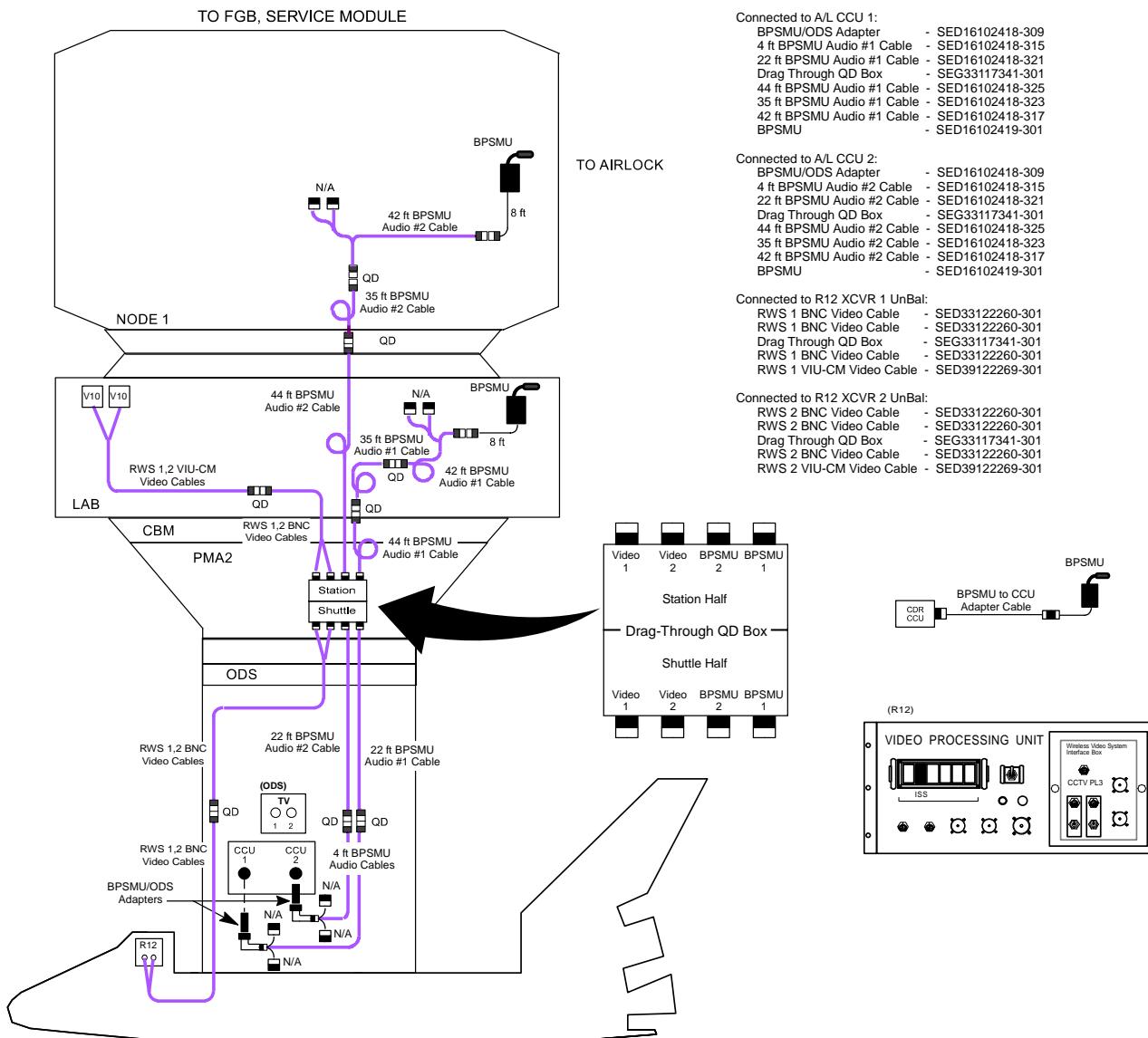
### DEACTIVATION

1. DCS 760  
Pwr – OFF  
Start batt recharge as reqd
2. TV System  
Go to DEACTIVATION (Cue Card, TV) as reqd

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## P/TV05 ISS INTERNAL OPS

### H/W SUMMARY



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## P/TV05 ISS INTERNAL OPS (Continued)

### SCENE SYNOPSIS

Scene contains procedures for documenting ISS internal ops (ingress, surveys, PAO events, logistics transfers, closeout, egress) w/video,still photos

### SETUP

#### WARNING

Locate QDs at hatches for ease in locating,disconnecting during hatch closure.  
Route,restrain cables to prevent loose cable lengths which could entrap crew

R12 (VPU)

1. √BPSMU AUDIO ONLY (BPSMU) (two) completed
2. For PAO live dnlk events  
Green Jumper – ISS  
√VPU PWR – ON (LED on)  
Perform ACTIVATION,OPERATION (Cue Card, TV) for DNLK OPS of ISS CC via PL 2 (VPU)
3. Relocate BPSMU w/BPSMU to CCU Adapter Cable to CDR CCU
4. Perform 760 PROGRAM w/FLASH (DCS 760)

## P/TV05 ISS INTERNAL OPS (Concluded)

### OPS

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	PAO Events			<u>ISS PD100</u>	LIVE	
	2. 13A-23	GENERAL ISS IVA ACTIVITY • PAO Scenes of Interest • Crew Photo	<u>760</u> 28-70mm Perform 760 CREW PHOTO (SETUP, <u>DCS</u> <u>760</u> )		<u>ISS PD100</u>	LIVE (if avail)	Plan for end of day crew choice video, DCS

If OPS temporarily suspended, perform DEACTIVATION as reqd

If OPS completed, go to DEACTIVATION

### DEACTIVATION

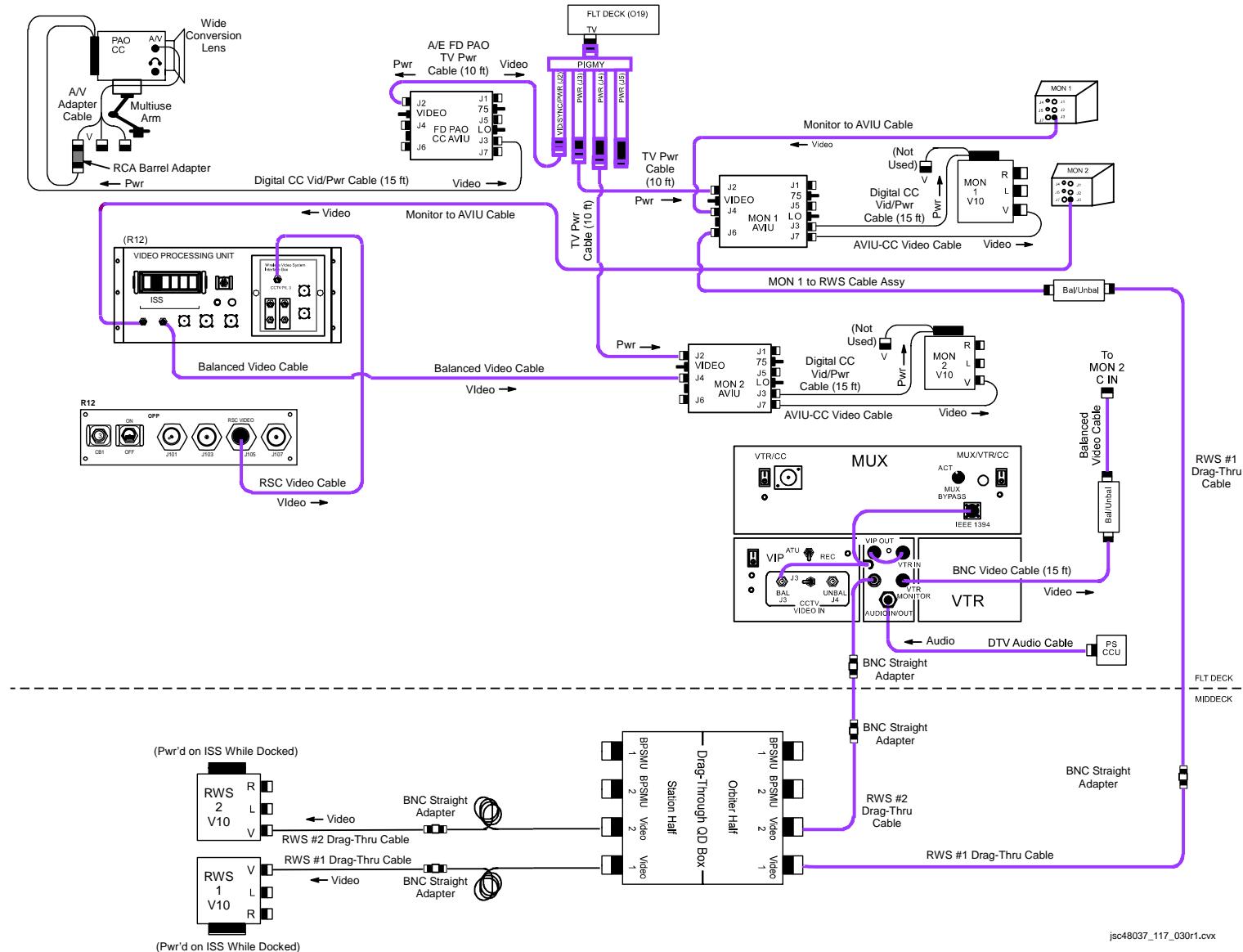
1. DCS 760  
Pwr – OFF  
Start batt recharge as reqd

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# P/TV06 S3/S4 INSTALL

## P/TV06 S3/S4 INSTALLATION

### H/W SUMMARY



jsc48037\_117\_030r1.csv

## P/TV06 S3/S4 INSTALLATION (Continued)

### SCENE SYNOPSIS

Scene contains procedures for documenting ISS RMS-assisted Assembly Ops w/video, still photos

### QUICK CHECK

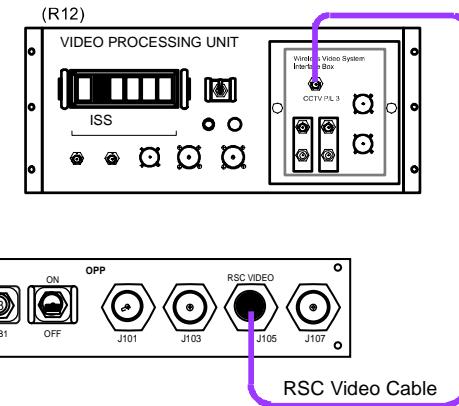
V10 (two)		PAO CC	
O19	✓TV PWR – ON	O19	✓TV PWR – ON
R12 (VPU)	✓VPU PWR – ON (LED on)	CC	PWR – CAMERA Tape – Install ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO
V10	PWR – ON Tape – Install DISPLAY pb – Toggle to display tape counter		✓Scene composition, focus
<hr/>			
RSC Camr		DTV	
R12 (OBSS)	✓RSC PWR – ON ✓RSC Video Cable connected between R12/OPP- RSC Video and R12/VPU-CCTV PL 3	L10 (MUX)  (VIP)  (VTR)	✓VTR/CC PWR – on (LED on) If dnlk, MUX/VTR/CC PWR – on (LED on) PWR – on (LED on) ✓ON/STBY LED – green ✓Tape installed
		MON 2	SOURCE – C

## P/TV06 S3/S4 INSTALLATION (Continued)

### SETUP

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. Config RSC Camr, ISS  
✓RSC Video Cable connected to WIB PL3 per dwg at right  
✓cb OBSS SW PWR – cl  
✓OBSS SW PWR – ON  
✓RSC PWR – ON  
✓Green Jumper – ISS  
✓VPU PWR – ON (LED on)
6. Perform ANALOG PAO CC (SONY PD100)
7. Perform RWS VIDEO CABLE SETUP FOR S3/S4 INSTALL (SONY V10)
8. ✓BPSMU w/BPSMU to CCU Adapter Cable connected to CDR CCU

R12 (OPP)  
(OBSS)  
(VPU)



jsc48037\_144.csv

## P/TV06 S3/S4 INSTALLATION (Continued)

### OPS

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	PAO Coverage	IVA 760 28-70mm If exterior: Flash ON/OFF – OFF	As desired	PD100 As desired	LIVE (if avail)	Plan for end of day crew choice video, DCS stills
	2. 13A-6 13A-7 13A-8	S3/S4 Unberth <ul style="list-style-type: none"><li>• Handoff to SSRMS</li><li>• S3/S4 Installation</li><li>• Full Views</li><li>• Closeup</li></ul>		Per SODF: RBT FS			Replay acceptable If Replay, prior to EVA 2  <u>Replay or post flt</u>
	3. 13A-13	SAW Blanket Deploy		Per SODF: RBT FS			Live; replay acceptable
	4. 13A-14	SARJ Motion <ul style="list-style-type: none"><li>• Global View</li><li>• Closeup Views</li><li>• Clearances</li><li>• Sun Tracking</li></ul>		Per SODF: RBT FS			Gnd controlled Postflight return if controlled by crew
	5. 13A-15	SAW Retraction <ul style="list-style-type: none"><li>• Tension Mechanism</li><li>• Tension Bars</li><li>• Mast Entering Canister</li><li>• Full View</li></ul>		Per SODF: RBT FS			Live dnlk
	6. 13A-16	Solar Array Deploy <ul style="list-style-type: none"><li>• Tension Mechanism</li><li>• Tension Bars</li><li>• Mast Entering Canister</li><li>• Full View</li></ul>		Per SODF: RBT FS			Live dnlk

## P/TV06 S3/S4 INSTALLATION (Concluded)

### OPS (Concluded)

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	7. 13A-18	PVR Deploy <ul style="list-style-type: none"><li>• Mechanisms</li><li>• Full View of Radiators</li><li>Closeup View of Panels</li></ul>		Per SODF: RBT FS			Live dnlk
	8. 13A-19	MT Translations <ul style="list-style-type: none"><li>• For S3/S4 Install</li><li>• For P6 Removal</li><li>• For P6 Install</li><li>• With PVRGF</li><li>• From S0 to S3</li><li>• Final Park</li></ul>		Per SODF: RBT FS			Live dnlk

If operations temporarily suspended, perform DEACTIVATION as reqd

If operations completed, go to DEACTIVATION

### DEACTIVATION

#### 1. TV System

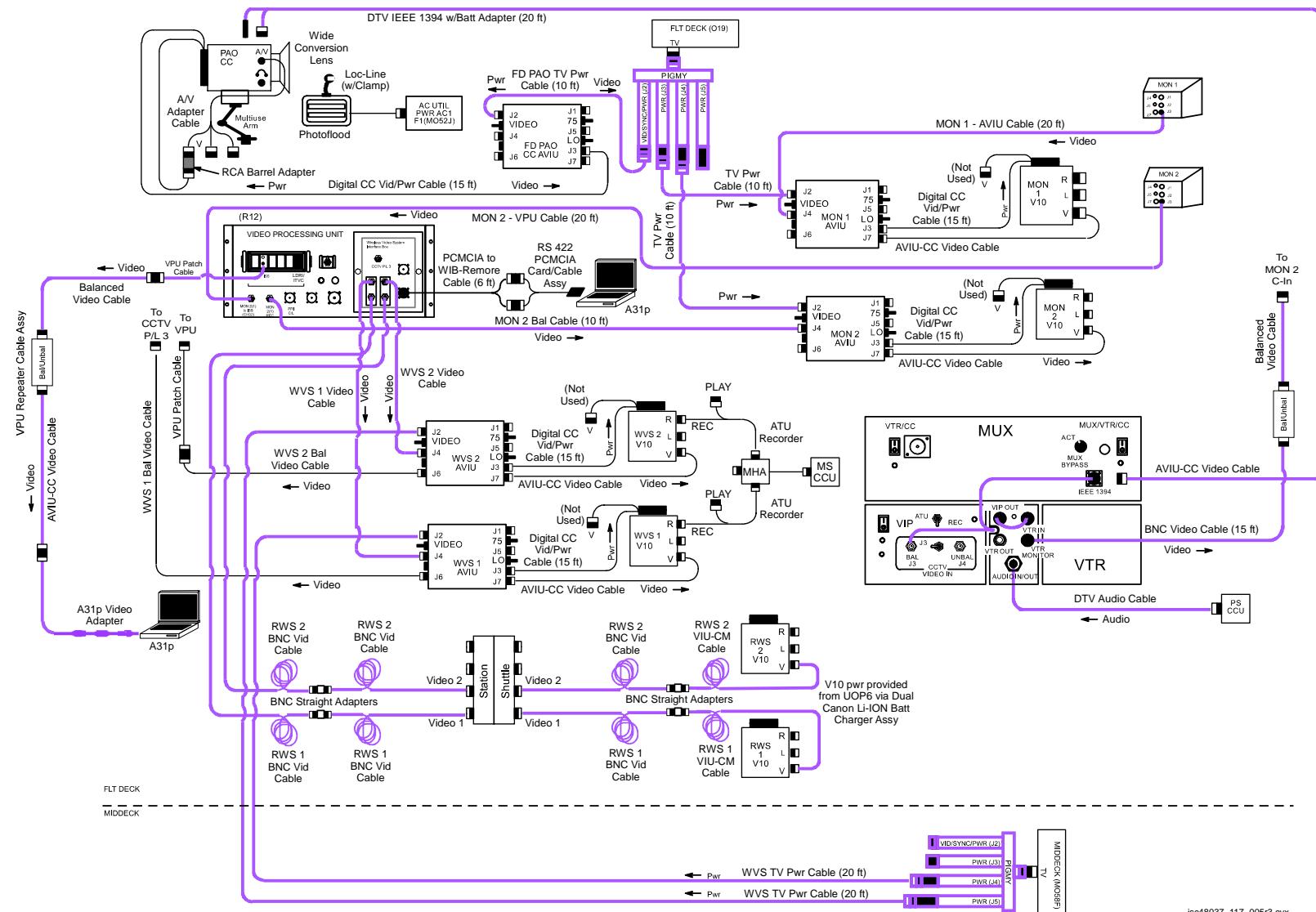
Go to DEACTIVATION (Cue Card, TV) as reqd

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# P/TV07 EVA

## P/TV07 EVA

### H/W SUMMARY



## P/TV07 EVA (Continued)

### SCENE SYNOPSIS

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

### QUICK CHECK

Shuttle V10 (four)		Flt Deck PAO CC		WVS		
O19, MO58F	✓TV PWR – ON	O19	✓TV PWR – ON	A7	✓WIRELESS VID HTR – ON PWR – ON	
R12 (VPU)	✓VPU PWR – ON (LED on)	CC	PWR – CAMERA Tape – Install ✓Viewfinder (LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO	R12 (VPU)	✓RWS 1,2 BNC Video Cables connected to XCVR 1,2 UNBAL Connectors	
V10	PWR – ON Tape – Install DISPLAY pb – Toggle to display tape counter		✓Scene composition, focus			
DTV						
L10 (MUX)	✓VTR/CC PWR – on (LED on) If dnlk, MUX/VTR/CC PWR – on (LED on)					
(VIP) (VTR)	PWR – on (LED on) ✓ON/STANDBY LED – green ✓Tape installed					
MON 2	SOURCE – C					

## P/TV07 EVA (Continued)

### SETUP

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. Perform ANALOG PAO CC (SONY PD100) for Flight Deck PAO CC (O19)
6. Config WVS and WVS PGSC  
✓WVS INITIAL SETUP w/o ERCAs, steps 1,2 performed  
Perform WVS DAY-OF-EVA CHECK (WVS)
7. Perform RWS V10 FROM WVS (SONY V10)
8. ✓760 EVA configured per Timeline callout (FLIGHT PLAN, DETAILED TIMELINE)
9. For IVA use  
Perform 760 PROGRAM w/FLASH (DCS 760)

## P/TV07 EVA (Continued)

### SETUP (Concluded)

10. Config LDRI/ITVC Video (as reqd)
  - R12 (VPU)
    - Green Jumper – LDRI/ITVC
    - √VPU PWR – ON (LED on)
  - (OPP)
    - √cb OBSS SW PWR – cl
    - √OBSS SW PWR – ON
  - (OBSS)
    - √SPEE PWR – ON
    - ITVC ENA - ON
  - A7
    - VID OUT MON 1(2) pb – push
    - IN PL2(VPU) PB – PUSH
    - If MAN GAIN pb not illuminated:
      - ITVC ENA – OFF, wait 10 sec, ON
      - Repeat until MAN GAIN illuminated
  - A7
    - LT LEVEL pb – push
    - DAY(NIGHT) pb – push
    - ALC pb – push
    - AVG pb – push
  - MON 1(2)
    - √ITVC video displayed
11. Config ISS Video
  - Perform A31p VIDEO OVERLAY (PORTABLE MONITORS) for ISS video source

## P/TV07 EVA (Continued)

### OPS

EVA 1							
√	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1. 13A-23	PAO Coverage	<u>IVA 760</u> 28-70mm If exterior: Flash ON/OFF – OFF	As desired	<u>PD100</u> As desired	LIVE (if avail)	Plan for end of day crew choice video, DCS stills
	2. 13A-9	SARJ • DLA1 Install • DLA2 Engage/Deploy		<u>WVS</u>		LIVE (if avail)	Return post flight
	3. 13A-10	S3 • Upper,Lower Tray Utilities • Rail Interfaces,Gaps • MT/UMA Rail		<u>WVS</u>		LIVE (if avail)	Return post flight
	4. 13A-11	S4 • RTAs Latch Removal • BGA Release • BGA Linkage • Latch Engagement • SABB Restraints • SABB/IEA Release • Stowed Keel • AJIS Struts		<u>WVS</u>		LIVE (if avail)	Return post flight
	5. 13A-18	PVR Deploy • Mechanisms • SDTO 13005-U		<u>A(B,C,D)</u>		LIVE (if avail)	

## P/TV07 EVA (Continued)

### OPS (Continued)

√	Item # Track #	Rqmts	EVA 2				Notes
			Still Imagery DCS	Video			
PLB	CC	Dnlk					
	<b>6.</b> 13A-23	PAO Coverage	<u>IVA 760</u> 28-70mm If exterior: Flash ON/OFF – OFF	As desired	<u>PD100</u> As desired	LIVE (if avail)	Plan for end of day crew choice video, DCS stills
	<b>7.</b> 13A-9	SARJ <ul style="list-style-type: none"><li>• Launch Restraint Removal</li><li>• Inner/Outer Ring</li><li>• DLA2 Engage/Deploy</li><li>• SARJ Braces Installation</li></ul>	<u>EVA 760</u> As B/U	<u>WVS</u>		LIVE (if avail)	Return post flight
	<b>8.</b> 13A-10	S3 <ul style="list-style-type: none"><li>• Rail InterfacesGaps</li><li>• Keel/Drag Link Removal</li><li>• MT/UMA Rail</li></ul>		<u>WVS</u>		LIVE (if avail)	Return post flight

## P/TV07 EVA (Concluded)

### OPS (Concluded)

EVA 3							
√	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	<b>9.</b> 13A-23	PAO Coverage	<u>IVA 760</u> 28-70mm If exterior: Flash ON/OFF – OFF	As desired	<u>PD100</u> As desired	LIVE (if avail)	Plan for end of day crew choice video, DCS stills
	<b>10.</b> 13A-10	S3 <ul style="list-style-type: none"><li>• Fluid Jumper Installation</li><li>• Rail Interfaces,Gaps</li><li>• Keel/Drag Link Removal</li><li>• Temp Rail Stop Install</li><li>• MT/UMA Rail</li></ul>		<u>WVS</u>		LIVE (if avail)	Return post flight

If operations temporarily suspended, perform DEACTIVATION as reqd

If operations completed, go to DEACTIVATION

### DEACTIVATION

1. IVA DCS 760  
Pwr – OFF  
✓ Flash ON/OFF – ON  
Download images  
Start batt recharge as reqd
2. TV System  
Perform PWRDN (Cue Card, WVS)  
Go to DEACTIVATION (Cue Card, TV) as reqd

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**P/TV08  
EXT SURVEY**

**P/TV08 EXTERNAL SURVEY**

SCENE SYNOPSIS

Scene contains procedures for documenting external structures w/still photos

SETUP

1. 760 Camr Configuration
  - If Sunlit OMS Pod Survey, config 760 Manual
    - 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 – M
        - SS – 1000
      - AF Area Mode – [ ] (no "+")
      - Meter – Matrix
      - Diopter – Adjust
      - Film Adv – S
      - Body Focus Mode – S
      - Lens Focus Mode – A(M/A)
      - Aperture – Min,locked
        - f/stop – F8
      - Flash Settings
        - ON/OFF – OFF

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## P/TV08 EXTERNAL SURVEY (Continued)

### SETUP (Concluded)

#### 1. 760 Camr Configuration (Concluded)

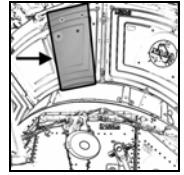
~

|  
If Earthshine OMS Pod Survey, config 760 Program  
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 – [ ] (no "+")  
Meter – Spot  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – S  
Lens Focus Mode – A(M/A)  
Aperture – Min,locked  
Flash Settings  
ON/OFF – OFF

#### 2. Perform 760 SHUTTER PRIORITY (DCS 760)

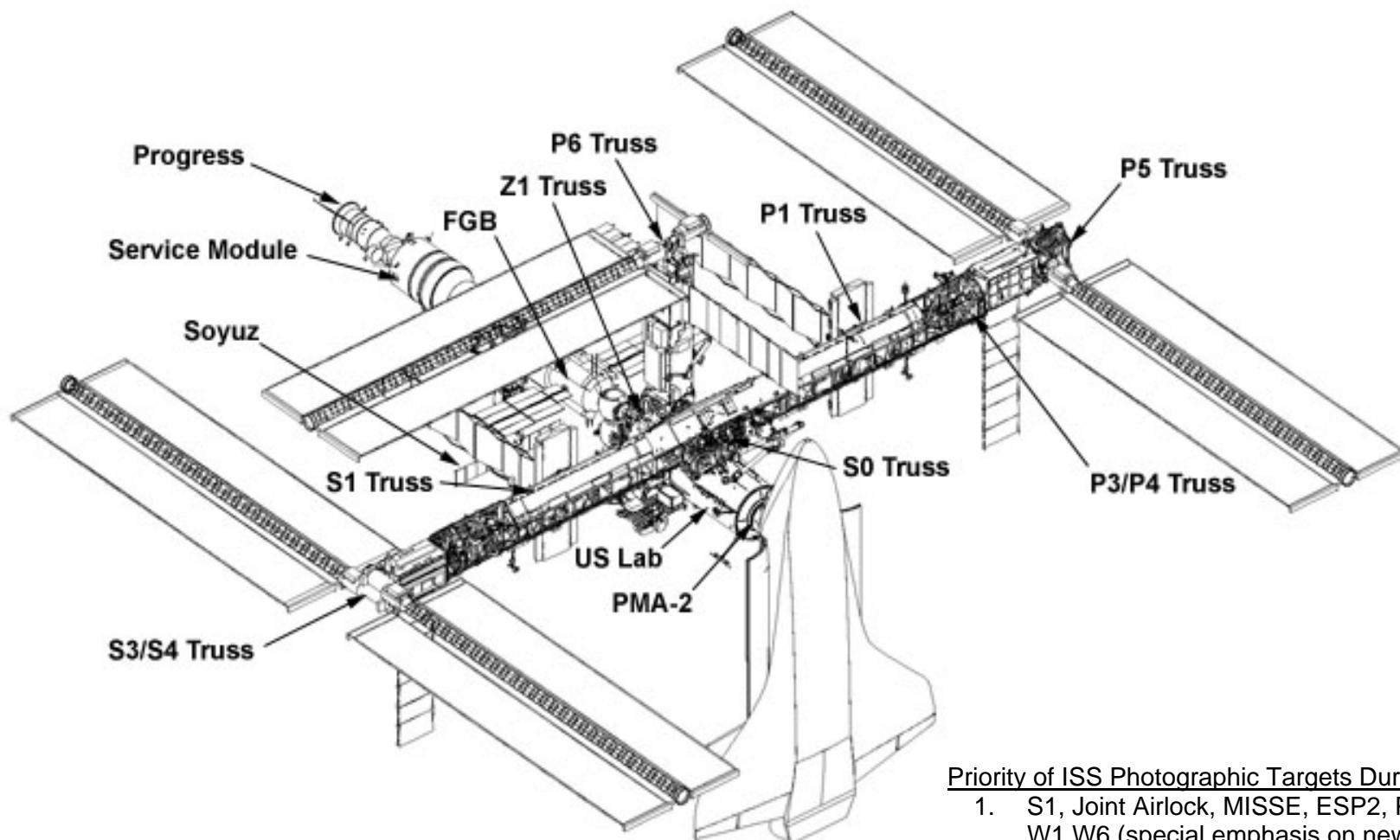
## P/TV08 EXTERNAL SURVEY (Continued)

### OPS

✓	Item # Track #	Rqmts	Still Imagery	Video			Notes
			DCS	PLB	CC	Dnlk	
	1.	<u>OMS Pod Survey</u> <ul style="list-style-type: none"> <li>• 50 percent mapping of both OMS pods and vertical stabilizer w/emphasis on Black Tile areas</li> </ul>	<u>760</u> 180mm(400mm)				Download images to MCC once complete
	2. 13A-22	<u>ISS Still Survey</u> <ul style="list-style-type: none"> <li>• Surfaces</li> <li>• Solar Panels</li> <li>• Handrails</li> <li>• MISSE</li> <li>• S0,S1,P1,S3/S4, P3/P4,P6 Truss</li> <li>• Plasma Arcing on ISS Anodized Surfaces in Velocity Vector</li> <li>• Thermal Radiators</li> <li>• External Camr Mounts</li> <li>• External Wireless Video Assy</li> <li>• SSRMS</li> <li>• MT/MBS</li> <li>• CETA Certs</li> </ul>	<u>760</u> 50mm(180mm)				Map ISS surfaces w/10% overlap  Plasma Arcing Location 

## P/TV08 EXTERNAL SURVEY (Continued)

OPS (Continued)



### Priority of ISS Photographic Targets During Docked Phase:

1. S1, Joint Airlock, MISSE, ESP2, P1, Solar Arrays – W1,W6 (special emphasis on newly installed components)
2. P6, S0, Lab – W7,W8
3. PMA2 – W9,W10
4. SVS Targets – All windows
5. P6 Fwd Radiator – Fwd windows

## P/TV08 EXTERNAL SURVEY (Concluded)

### OPS (Concluded)

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

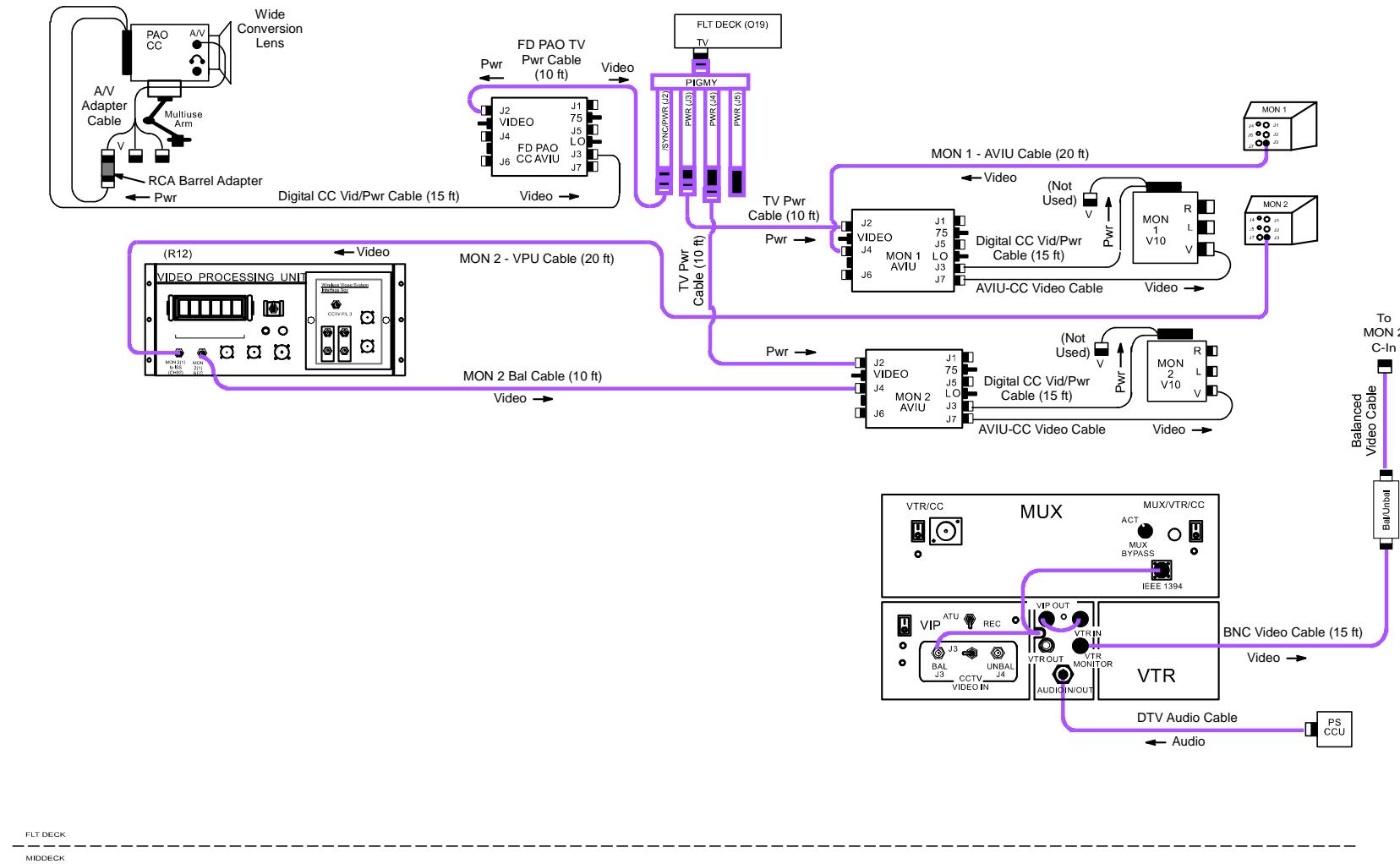
### DEACTIVATION

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

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## P/TV09 STRUCTURAL DYNAMICS

### H/W SUMMARY



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## P/TV09 STRUCTURAL DYNAMICS (Continued)

### SCENE SYNOPSIS

Scene contains procedures for recording structural dynamic loads

### QUICK CHECK

V10 (two)		Flt Deck PAO CC	
O19	√TV PWR – ON	MO58F	√TV PWR – ON
R12 (VPU)	√VPU PWR – ON (LED on)	CC	PWR – CAMERA Tape – Install √Viewfinder (LCD) displays STBY Camr Settings √AUTO LOCK – AUTO LOCK √FOCUS – AUTO
V10	PWR – ON Tape – Install DISPLAY pb – Toggle to display tape counter		√Scene composition, focus
DTV			
L10 (MUX) (VIP) (VTR)	√VTR/CC PWR – on (LED on) If dnlk, MUX/VTR/CC PWR – on (LED on) PWR – on (LED on) √ON/STANDBY LED – green √Tape installed		
MON 2	SOURCE – C		

## P/TV09 STRUCTURAL DYNAMICS (Continued)

### SETUP

1. Perform V10 From MON 1 (SONY V10)
2. Perform V10 From MON 2 (SONY V10)
3. Perform ANALOG PAO CC (SONY PD100)
4. TV System Configuration

#### NOTE

Remain in Sync mode to ensure proper video, A7 pnl indicator lts

Perform ACTIVATION,OPERATION (Cue Card, TV)  
Perform ILLUMINATOR OPS (Cue Card, TV) for Camrs A,B,C

5. Perform SETUP (DTV)

6. Monitor Setup  
USCAN – ON  
L-DATA – ON  
C-DATA – GRN  
XHAIR – GRN

MON 1,2

## P/TV09 STRUCTURAL DYNAMICS (Continued)

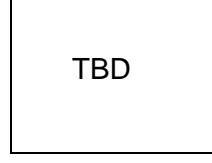
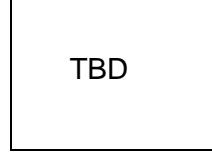
### SETUP (Concluded)

- A7      7. Zero PTU Angles (If not previously set up by MCC)  
VID OUT MON 1(2) pb – push  
IN A pb – push  
CAMR CMD PAN,TILT – Center Camr B in FOV  
ZOOM – Full zoom in
- VID IN B pb – push  
CAMR CMD PAN,TILT – Center Camr A in FOV  
ZOOM – Full zoom in
- VID IN A pb – push  
√CAMR CMD PAN/TILT – LOW RATE  
PAN,TILT – Recenter Camr B in FOV  
PAN/TILT – RESET
- VID IN B pb – push  
CAMR CMD PAN,TILT – Recenter Camr A in FOV  
PAN/TILT – RESET

Repeat for Camrs D,C

## P/TV09 STRUCTURAL DYNAMICS (Continued)

### OPS

✓	Item #	Rqmts	Video	Notes
	1. 13A-17	Dynamics of Solar Arrays,Radiators • Install Fresh Tapes in Recorders (three)		
	2.	Camr FOV Setup Prior to Test  • Frame per values but use pictures for final pan,tilt  • Pan/tilt settings approx and assume zeroed, PTU angles  • <b>✓A,B,C Illuminators – On</b>	TBD  PAN: TBD TILT: TBD FOV: TBD  Actual FOV: _____	Frame as shown   TBD
			TBD  PAN: TBD TILT: TBD FOV: TBD  Actual FOV: _____	Frame as shown   TBD
			TBD  PAN: TBD TILT: TBD FOV: TBD  Actual FOV: _____	Frame as shown   TBD

## P/TV09 STRUCTURAL DYNAMICS (Continued)

### OPS (Continued)

√	Item #	Rqmts	Video	Notes
<b>NOTE</b> To maintain Time sync, once video recorders started, do not stop tape until test completed				
	3.	Start Recorders (three)	V10 (two) REC pb (two) – push to begin recording √LCD displays RED DOT L10 (VTR) REC pb – push, hold PLAY pb – push, SIMO (RED dot displayed)	
	4.	Route FD CC Video to Recorders (three) and Downlink	VID OUT MON 1 pb – push IN FLT DECK pb – push Frame GMT clock in FD CC FOV using MON 1 VID OUT MON 2 pb – push IN FLT DECK pb – push √GMT clock on MON 2 DTV view of FD CC √GMT clock on V10 LCD (two) VID OUT DNLINK pb – push IN FLT DECK pb – push	Rcd at least 10 sec of GMT clock video onto each device  Dnlk GMT clock, if comm
	5.	Route Views to Recorders (three) and Downlink	VID OUT MON 1 pb – push IN A pb – push VID OUT MON 2 pb – push IN B pb – push VID OUT DTV pb – push IN C pb – push VID OUT DNLINK pb – push IN A pb – push	Rcd views for 35 min or until end of event Gnd may switch dnlk view during test  Dnlk view if comm
	6.	Re-route FD CC Video to Recorders (three) and Downlink Before Tape Ends	VID OUT MON 1 pb – push IN MIDDECK pb – push Frame GMT clock in FD CC FOV using MON 1 VID OUT MON 2 pb – push IN FLT DECK pb – push √GMT clock on MON 2 DTV view of FD CC √GMT clock on V10 LCD (two) VID OUT DNLINK pb – push IN FLT DECK pb – push	Rcd at least 10 sec of GMT clock video onto each device  Dnlk GMT clock, if comm

## P/TV09 STRUCTURAL DYNAMICS (Concluded)

### OPS (Concluded)

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

### DEACTIVATION

#### 1. TV System

Label tapes as "Structural Dynamics"  
Go to DEACTIVATION (Cue Card, TV) as reqd

NIKON F5

|

NOTE  
Not being flown

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## DCS 760

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**DCS 760****SETUP****760 PROGRAM w/FLASH**

Pwr – ON  
 ✓Disk installed  
 Rear LCD  
 ✓Batt  
 ✓Frames remaining sufficient  
 ✓White Balance – Auto  
 ISO – 100  
 ✓BKT disabled  
 ✓Focus Area – Center, LOCK displayed  
 Exp Comp – 0.0  
 Exp Mode – P  
 AF Area Mode – [ ] (no "+")  
 Meter – Matrix  
 Diopter – Adjust  
 Film Adv – S  
 Body Focus Mode – S  
 Lens Focus Mode – A (M/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 – Auto  
 ISO – 100  
 ✓BKT disabled  
 ✓Focus Area – Center, LOCK displayed  
 Exp Comp – 0.0  
 Exp Mode – S  
 SS – 500  
 AF Area Mode – [ ] (no "+")

**NOTE**

For Docking:  
 Meter – Spot/Matrix  
 For Undocking:  
 Meter – Matrix/Spot

Meter – Matrix (Spot when ISS <1/2 frame)  
 Diopter – Adjust  
 Film Adv – S  
 Body Focus Mode – S  
 Lens Focus Mode – A (M/A)  
 Aperture – Min, locked  
 Flash Settings  
 ON/OFF – OFF

## **DCS 760 (Continued)**

### **SETUP (Continued)**

#### 760 SHUTTER PRIORITY w/AUTO-BRACKETING

Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
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 – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – C<sub>H</sub>  
Body Focus Mode – S  
Lens Focus Mode – A (M/A)  
Aperture – Min, locked  
Flash Settings  
ON/OFF – OFF

#### 760 CREW PHOTO

Lens – 28mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
✓ISO – 100  
✓BKT – OFF  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – A  
AF Area Mode – [ ] (no "+")  
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

## **DCS 760 (Continued)**

### **SETUP (Continued)**

#### 760 EXPOSURE MATCH

Lens – 28mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
✓ISO – 100  
✓BKT disabled  
✓Focus Area – Center, LOCK displayed  
✓CSM – 21-1, AEL  
Exp Comp – 0.0  
Exp Mode – P  
AF Area Mode – [ ] (no "+")  
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 AURORA/AIRGLOW

Lens – 50mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 400  
✓BKT – BKT, 3F 1.0 displayed  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – M  
    SS – 2"  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – C<sub>H</sub>  
Body Focus Mode – M  
Aperture – Min, locked  
    f/stop – F1.4  
Flash Settings  
    ON/OFF – OFF  
Remote Release – Install  
Multiuse Brkt (Clamp)  
Focus, Frame, Fire, hold for 3 frames

#### TECHNIQUE

1. Fill FOV w/Sunlit subject
2. Activate Camr
3. Exposure Lock pb – Depress and hold  
Expect values such as 250, F11
4. Focus, Frame, Fire

#### TECHNIQUE

1. Dim Cabin Lights
2. Use Witches Hat or dark clothing to shield window

## **DCS 760 (Continued)**

### **SETUP (Continued)**

#### 760 CITY LIGHTS/STARS

Lens – 50mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 400  
✓BKT – BKT, 3F 1.0 displayed  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – M  
SS – 2  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – C<sub>H</sub>  
Body Focus Mode – M  
Aperture – Min, locked  
f/stop – F1.4  
Flash Settings  
ON/OFF – OFF  
Remote Release – Install  
Multiuse Brkt (Clamp)  
Focus, Frame, Fire, hold for 3 frames

#### 760 LIGHTNING

Lens – 50mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 400  
✓BKT – Disabled  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – M  
SS – 2"  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – M  
Aperture – Min, locked  
f/stop – F1.4  
Flash Settings  
ON/OFF – OFF  
Remote Release – Install  
Multiuse Brkt (Clamp)  
Focus, Frame, Fire

#### TECHNIQUE

1. Dim Cabin lights
2. Use dark clothing to shield window

#### TECHNIQUE

Fire Camr repeatedly. Luck reqd

## **DCS 760 (Continued)**

### **SETUP (Continued)**

#### 760 MOON

Lens – As reqd  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 100  
✓BKT – Disabled  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – M  
SS – 500  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – S  
Aperture – Min, locked  
f/stop – F8  
Flash Settings  
    ON/OFF – OFF  
Multiuse Brkt (Clamp)

#### 760 SILHOUETTE

Lens – 50mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 100  
✓BKT – Disabled  
✓Focus Area – Center, LOCK displayed  
✓CSM – 21-1, AEL  
Exp Comp – 0.0  
Exp Mode – P  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – S  
Aperture – Min, locked  
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

## **DCS 760 (Continued)**

### **SETUP (Continued)**

#### 760 SUNRISE/SUNSET

Lens – As reqd  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 400  
✓BKT – BKT, 3F 1.0 displayed  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – P  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – C<sub>H</sub>  
Body Focus Mode – S  
Aperture – Min, locked  
Flash Settings  
    ON/OFF – OFF  
Focus, Frame, Fire, hold for 3 frames

**WARNING**  
Do not look at Sun

#### 760 SUN STAR EFFECT

Lens – 16mm  
Pwr – ON  
✓Disk installed  
Rear LCD  
✓Batt  
✓Frames remaining sufficient  
✓White Balance – Auto  
ISO – 100  
✓BKT – Disabled  
✓Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – A  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – M  
Aperture – Min, locked  
    f/stop – F22  
Flash Settings  
    ON/OFF – OFF  
Focus, Frame, Fire

#### TECHNIQUE

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

## **DCS 760 (Continued)**

### **SETUP (Concluded)**

#### 760 TV MONITOR

Lens – 50mm  
Pwr – ON  
√Disk installed  
Rear LCD  
√Batt  
√Frames remaining sufficient  
√White Balance – Auto  
√ISO – 100  
√BKT – Disabled  
√Focus Area – Center, LOCK displayed  
Exp Comp – 0.0  
Exp Mode – S  
    SS – 30  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – S  
Aperture – Min, locked  
Flash Settings  
    ON/OFF – OFF  
Focus, Frame, Fire

## **DCS 760 (Continued)**

### **SPECIFICATIONS**

#### CAMR BODY

CCD SIZE: 18.48mm x 27.65mm

PIXEL COUNT: 2008 x 3032

DISK/FRAME: 1 GB Microdrive: 117 Frames; 1 GB EVA Flash Card: 112 Frames

FILE SIZE: 6 MB

EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual

METER PATTERN: 3D Color Matrix, Center Weighted, Spot

EXPOSURE COMP:  $\pm 5$  in 1/3 stops

SHUTTER:

Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)

Manual & Shutter Priority – 1/8000 thru 30 sec (1/3 stop increments), and B (manual only)

ISO Setting:

Manual: 80-400

MOTOR DRIVE: Single, C<sub>H</sub> (1.5 fps), C<sub>L</sub> (1.0 fps), C<sub>S</sub> (1.0 fps)

Interval: 10-25 shot burst

CAMR BATT: Rechargeable

CAMR BATT VOLTAGE: 7.2V

CAMR BATT LIFETIME: ~100 frames

CAMR WEIGHT: 4.09 lb (w/batt & PCMCIA)

#### FLASH

BATT: 4AA

BATT LIFETIME: ~144-216 shot

WEIGHT: w/o Batts – 0.85 lb

## DCS 760 (Continued)

### LENS DATA

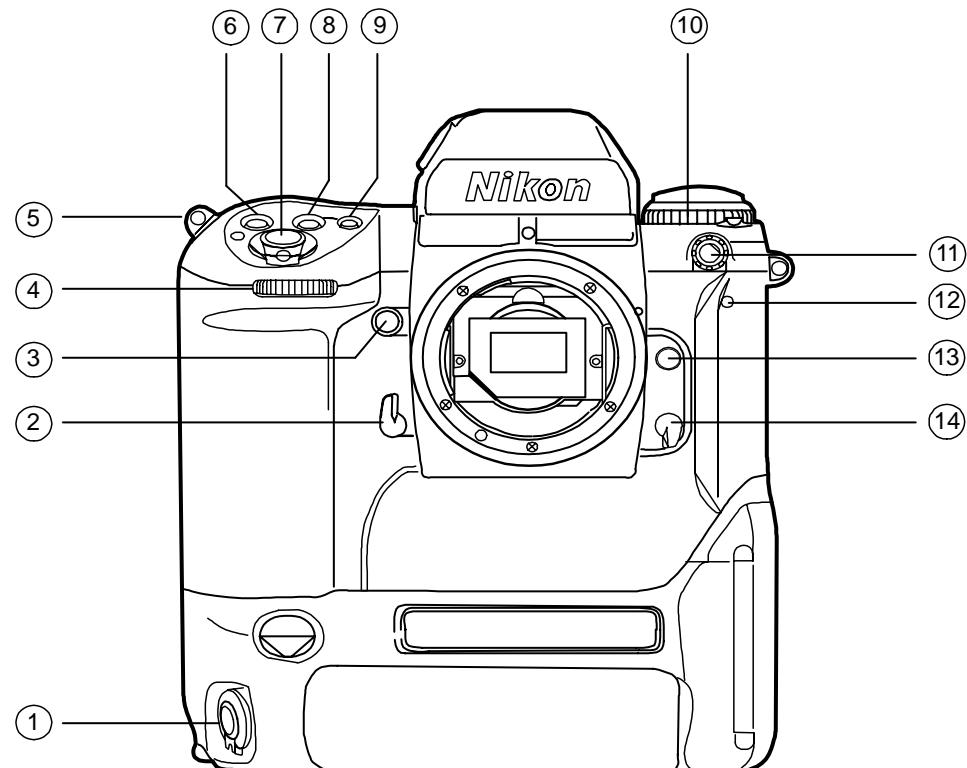
#### NOTE

Do not use non-AF lens w/DCS 760

Lens	Aperture Range (f/stop)	Approximate Field of View (FOV)			Approx Minimum Focus Distance (ft)	Weight (lb)	Filter Size	M-A Switch
		Horizontal	Vertical	Diagonal				
16mm AF	f/2.8-f/22	123°	82°	148°	1.0	0.69	Rear	
17-35mm AFD	f/2.8-f/22	78°-43°	57°-30°	89°-51°	1.0	1.64	77mm	Yes
20mm AF	f/2.8-f/22	69°	50°	80°	0.85	0.62	62mm	
20-35mm AFD	f/2.8-f/22	69°-43°	50°-30°	51°	1.7	1.36	77mm	Yes
28mm AF	f/2.8-f/22	53°	37°	61°	1.25	0.46	52mm	
28mm AFD	f/1.4-f/16	53°	37°	61°	1.14	1.15	72mm	Yes
28-70mm AFD	f/2.8-f/22	53°-22°	37°-15°	61°-27°	2.3 (1.5 ft macro)	1.95	77mm	Yes
35mm AF	f/2.0-f/22	43°	30°	51°	0.9	0.51	52mm	
24-50mm AF	f/3.3(4.5)-f/22	60°-31°	42°-21°	69°-37°	2.0 (1.6 ft macro)	0.86	62mm	
35-70mm AF	f/2.8-f/22	43°-22°	30°-15°	51°-27°	2.0 (0.9 ft macro)	1.5	62mm	
50mm AFD	f/1.4-f/16	31°	21°	37°	1.5	0.59	52mm	
60mm AF	f/2.8-f/32	26°	18°	31°	0.73	0.93	62mm	Yes
85mm AF	f/1.8-f/16	19°	12°	22°	3.0	0.93	62mm	
105mm AF	f/2.8-f/32	15°	10°	18°	1.0	1.22	52mm	Yes
180mm AFD	f/2.8-f/22	9°	6°	11°	5.0	1.72	72mm	
80-200mm AFD	f/2.8-f/22	20°-8°	13°-5°	24°-10°	6.0	2.98	77mm	Yes
300mm AF	f/2.8-f/22	5°	4°	6°	10.0	6.36	39mm	Yes
400mm AFD	f/2.8-f/22	4°	3°	5°	9.75	10.58	52mm	Yes

## DCS 760 (Continued)

### NOMENCLATURE

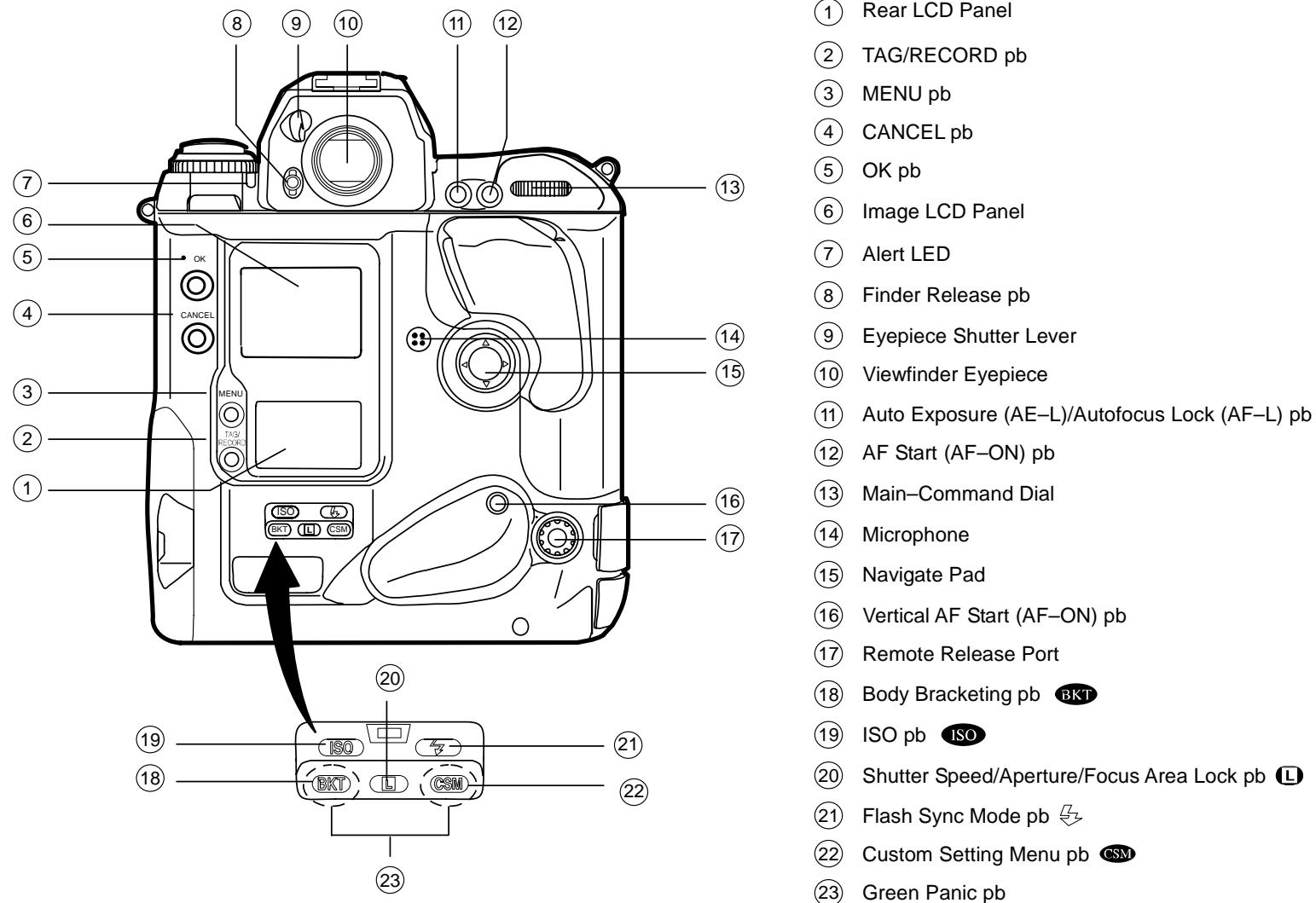


- ① Vertical-Shooting Shutter Release pb
- ② Mirror Lockup Lever
- ③ Depth of Field Preview pb
- ④ Sub-Command Dial
- ⑤ Camr Strap Eyelet
- ⑥ Exposure Compensation pb
- ⑦ Shutter Release pb
- ⑧ Exposure Mode pb
- ⑨ AF Area Mode pb
- ⑩ Film Advance Mode/Selftimer Selector
- ⑪ Sync Terminal
- ⑫ Selftimer LED
- ⑬ Lens Release pb
- ⑭ Body Focus Mode Selector

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## DCS 760 (Continued)

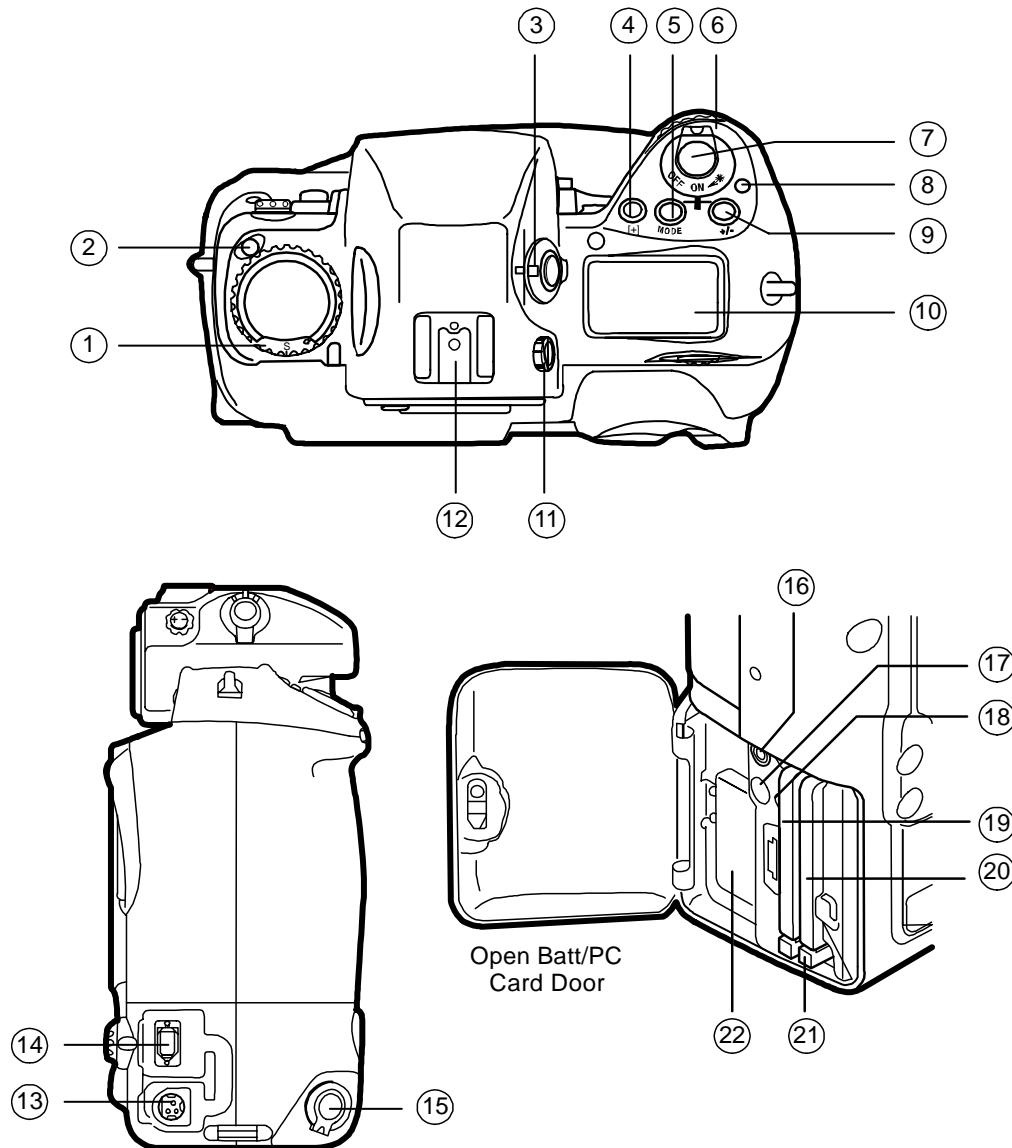
### NOMENCLATURE (Continued)



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## DCS 760 (Continued)

### NOMENCLATURE (Continued)

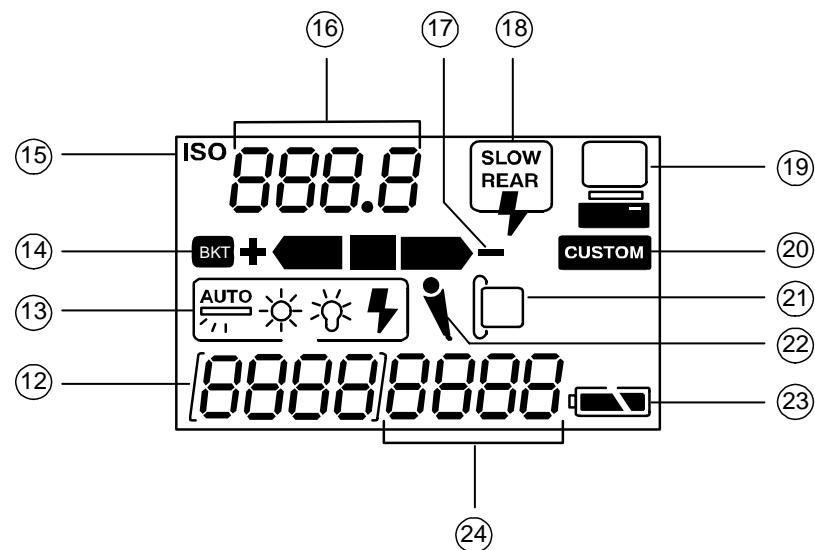
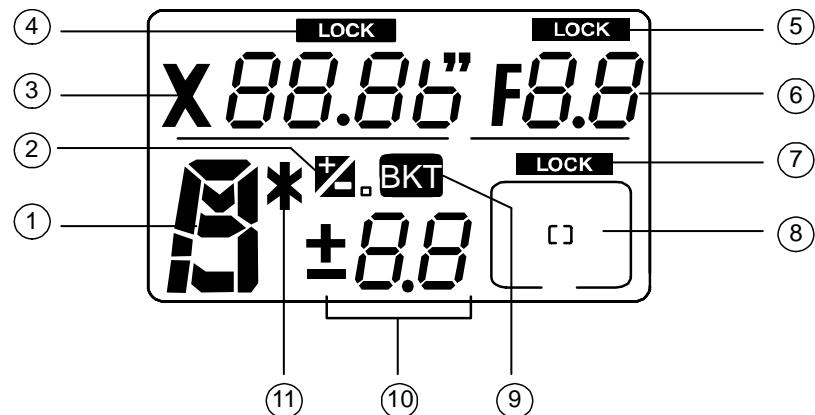


- ① Film Advance Mode/Selftimer Selector
- ② Film Advance Mode Selector Lock Release
- ③ Metering System Selector
- ④ AF Area Mode pb
- ⑤ Exposure Mode pb
- ⑥ Pwr/LCD Panel Illumination sw
- ⑦ Shutter Release pb
- ⑧ Pwr sw Lock Release
- ⑨ Exposure Compensation pb
- ⑩ Top LCD Panel
- ⑪ Diopter Adjustment Knob
- ⑫ Accessory Shoe
- ⑬ Pwr Adapter Connection (cover not shown)
- ⑭ IEEE 1394 Cable Port (cover not shown)
- ⑮ Vertical-Shooting Shutter Release pb
- ⑯ Serial Port
- ⑰ Video Port
- ⑱ Card Busy LED
- ⑲ Hard Drive Slot 1
- ⑳ Hard Drive Slot 2
- ㉑ Eject pb
- ㉒ Batt

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## DCS 760 (Continued)

### NOMENCLATURE (Concluded)



- (1) Exposure Mode
- (2) Exposure Compensation
- (3) Shutter Speed
- (4) Shutter Speed Lock
- (5) Aperture Lock
- (6) Aperture
- (7) Focus Area Lock
- (8) Focus Area
- (9) Bracketing
- (10) Exposure Compensation Value
- (11) Flexible Program
- (12) Frame Number
- (13) White Balance
- (14) Bracketing
- (15) ISO Setting Mode
- (16) ISO/Bracketing Information/Custom Setting
- (17) Bracketing Bar Graphs
- (18) Flash Sync Mode
- (19) Personal Computer Connection
- (20) Custom Setting
- (21) Hard Drive Present
- (22) Microphone
- (23) Batt Level
- (24) Frames Remaining on Hard Drive

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## DCS 760 (Continued)

### CUSTOM SETTINGS

#### NOTE

There are two menus for custom settings. Options on each menu are identical.  
Although either menu can be used, menu A is recommended for consistency

#### ACTIVATION

CSM pb – press,hold  
Main Command Dial – Rotate to desired setting number  
(lower rear LCD)  
Sub-command Dial – Rotate to desired setting (lower rear  
LCD)  
CSM pb – release, then press,hold again  
✓Number after dash is “1” and “CUSTOM” displayed on lower  
rear LCD

#### DEACTIVATION

BKT pb, CSM pb – press simo, hold for 2 sec (display blinks)  
✓“CUSTOM” no longer displayed on lower rear LCD  
Focus Area – Center, LOCK displayed  
Between Frame Data – PRINT

#	Menu	Settings	Notes
0	Selecting Custom Menus	0 - A: Custom settings A	Can specify setting combinations wanted for A,B; makes it easy to switch from one setting combination to another
		0 - B: Custom settings B	
1	Continuous Servo AF	1 - 0: Release-priority	Change from release-priority to focus-priority
		1 - 1: Focus-priority	
2	Single Servo AF	2 - 0: Focus-priority	Change from focus-priority to release-priority
		2 - 1: Release-priority	
3	Bracketing Order	3 - 0: Metered value, below metered value, above metered value	Change order to under the metered value, the metered value, and over the metered value
		3 - 1: Below metered value, metered value, above metered value	
4	Autofocus Activated When Shutter Release pb Lightly Pressed	4 - 0: Activated	Delete shutter release pb's AF activation function
		4 - 1: Disabled	
5	AE Lock	5 - 0: Exposure value	Lock shutter speed and aperture for AE lock function
		5 - 1: Shutter speed and aperture value	
6	Direction of Command Dial Rotation	6 - 0: Default	Change from left-to-right to right-to-left when increasing values
		6 - 1: Opposite	

## DCS 760 (Continued)

### CUSTOM SETTINGS (Continued)

#	Menu	Settings	Notes
7	AE Lock When Shutter Release pb Lightly Pressed	7 - 0: Disabled 7 - 1: Activated	Lock exposure when shutter release pb lightly pressed
8	Reserved	8 - 0:	
9	Reserved	9 - 0:	
10	Reserved	10 - 0:	
11	Alert LED in Long Time Exposure	11 - 0: Does not blink 11 - 1: Blinks	Make Alert LED blink during long time exposure
12	Reserved	12 - 0:	
13	Reserved	13 - 0: Canceled after release	
14	Center-Weighted Metering	14 - 0: Default (75% concentration in 12mm dia. area)  14 - 1: Change setting C 8: 8mm-dia C 12: 12mm-dia C 15: 15mm-dia C 20: 20mm-dia A: Average	Change 12mm-dia area to 8mm(15mm,20mm) average metering
15	Time Delay for Auto Meter-Switch-Off	15 - 0: Default (16 sec)  15 - 1: Change setting L 4: 4 sec L 8: 8 sec L 16: 16 sec L 32: 32 sec	Change from 16 sec to 4(8,12) sec
16	Self-Timer Duration	16 - 0: Default (10 sec)  16 - 1: Change setting L 2 to L60: 2 to 60 sec	Choose from 2 to 60 sec Go to L10 to clear setting
17	Bracketing in Manual Exposure Mode	17 - 0: Default (shifts shutter speed)  17 - 1: Change setting 11A: Shutter speed/aperture combination 10A: Shutter speed 01A: Aperture 00A: Flash output level	Change shifting factor in Manual Exposure mode from shutter speed to choice of shutter speed/aperture combination, aperture, or flash output level

## DCS 760 (Continued)

### CUSTOM SETTINGS (Concluded)

#	Menu	Settings	Notes
18	Focusing Screen Compensation	18 - 0: No compensation 18 - 1: Change setting -2.0 to 2.0: -2 to +2 in 0.5 EV steps	Change EV level of focusing screen from -2.0 to +2.0 in 0.5 EV steps. See special focusing screen instruction manual for reqd compensation value
19	Prolong Shutter Speed	19 - 0: Disabled 19 - 1: Enabled	Choose from 40 sec to 30 min duration Long exposures may add noise and produce a less desirable image. Images should not be > 0.5 sec
20	Top TTL, Flash Sync Speed	20 - 0: Default (1/250 sec) 20 - 1: Change setting 300: 1/300 sec 250: 1/250 sec 200: 1/200 sec 160: 1/160 sec 125: 1/125 sec 100: 1/100 sec 80: 1/80 sec 60: 1/60 sec	To set top TTL flash sync speed. 1/300 sec* can be selected only in Shutter-Priority Auto or Manual Exposure modes  *Shutter speed controlled by 1/250 in Programmed Auto or Aperture-Priority Auto exposure modes
21	AE-L/AF-L pb	21 - 0: Default (simultaneous lock) 21 - 1: Change setting AEL: AE lock AFL: AF lock L-L: Simultaneous lock	Change to AE(AF) lock only
22	Aperture Setting via Sub-Command Dial	22 - 0: Enabled 22 - 1: Disabled	Only way to set aperture is to rotate lens aperture ring
23	► or ◀ Focus Indicator	23 - 0: Displayed 23 - 1: Not displayed	Don't show display of ► and ◀ (focused at rear or in front of subject) in viewfinder during Autofocus mode
24	Auto Exposure/Flash Exposure Bracketing	24 - 0: Default (auto exposure/flash exposure bracketing) 24 - 1: Change setting 01E: Auto exposure (ambient) bracketing 10E: Flash exposure bracketing 11E: Auto exposure/flash exposure bracketing	When Auto(Flash) Exposure Bracketing only wanted

## **DCS 760 (Continued)**

### **DATE/TIME SET**

1. MENU pb – press
2. Navigate pad – sel Menu icon , then MAIN MENU
3. OK pb – press
4. Navigate pad – sel TIME/DATE
5. OK pb – press

**NOTE**

Set TIME/DATE to GMT

6. Navigate pad – sel desired field (left,right)
7. Navigate pad – sel desired setting (up,down)
8. OK pb – press

### **DELETING SINGLE IMAGES**

1. OK pb – press
2. Sel image
3. Navigate pad – down to sel Delete option 
4. OK pb – press (twice) to delete
5. CANCEL pb – press to exit Delete option

### **ADDING .WAV FILES TO AN IMAGE**

1. OK pb – press
2. Sel image
3. TAG/RECORD pb – press, hold ( appears on rear LCD)
4. Talk to MIC (~9-12 in from MIC)
5.  appears under image

## **DCS 760 (Continued)**

### **IMAGE VIEWING ON PGSC**

1. Insert DCS MICRO DRIVE(1 GB EVA Flash Card) into PGSC, brand name up
2. Open Shuttle Apps | Kodak DCS Photo Desk
3. Sel FILE | OPEN
4. Sel appropriate drive/folder
5. Sel “Open ‘-----’ as contact sheet”
6. To view image info:  
Sel VIEW  
√Image Info selected (check mark next to Image Info)  
Single-click on desired image
7. To view enlarged individual image:  
Double-click on desired image

### **DCS FILE TRANSFER**

#### **NOTE**

Do not delete images from cards. All images should be saved and cards stowed

#### **DNLK FROM MICRO DRIVE**

1. Insert DCS MICRO DRIVE(1 GB EVA Flash Card) into **KFX PGSC**, brand name up
2. Inform MCC “files ready”

#### **DCS FILE TO HARD DRIVE**

1. Insert DCS MICRO DRIVE(1 GB EVA Flash Card) into any **networked PGSC**, brand name up
2. Double click:  
“My Computer” icon on desktop  
“Removable Disk D” or appropriate drive  
“Folder 1” or appropriate folder
3. Select all files
4. Copy all files
5. Double click:  
“DCS Folder on KFX PGSC” shortcut on desktop  
Appropriate subfolder (e.g., FD1, OMS Pod, etc.)
6. Paste files
7. Close all windows
8. Inform MCC “files ready” on PGSC
9. Stow card

## **DCS 760 (Continued)**

### **SUSPECT HARD DRIVE SCAN**

1. Insert suspect DCS MICRO DRIVE(1 GB EVA Flash Card) into PGSC, brand name (white decal) up
2. Sel 'Start' | 'Run...'
3. In 'Run' window, type: SCANDISK, then sel OK
4. In 'ScanDisk' window:

Sel MICRO DRIVE drive (usually D: drive)  
√'Type of Test' – Standard  
Sel 'Automatically fix errors'  
Sel 'Start'

5. In 'ScanDisk Results' Window:

If error fixed(nonexistent), continue to use hard drive  
|  
If error not fixed, mark and stow hard drive  
Notify MCC of results

6. Close all windows used to scan hard drive

## **DCS 760 (Continued)**

### **IMAGE FILE COMPRESSION**

#### **NOTE**

Do not compress images for OCA dnlk. Image compression  
to be used only for image insertion into a document or e-mail

1. Perform IMAGE VIEWING ON PGSC, steps 1-5 on pg 3-19, then:
2. Single-click image for compression
3. Sel FILE | SAVE SELECTED AS (**Not “Save As”**)
4. Sel appropriate drive and folder in “Save In:” window
5. Sel “Standard JPEG (\*.jpg)” in format window
6. Sel Rename Image File(s)

If A31p:

7. Enter new file name in “Base Name” window
8. Sel “Save files in ‘-----’ ”

If PGSC 760XD:

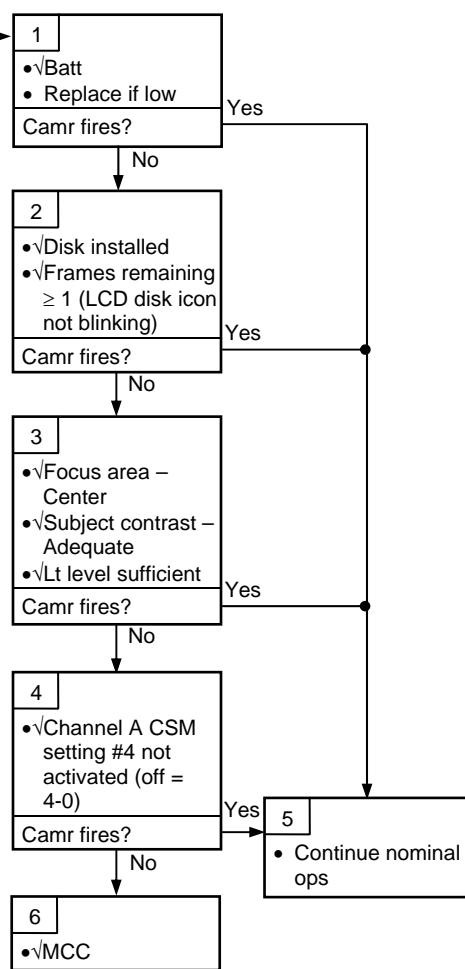
9. Enter new file name in New Name window
10. Sel “Save files in ‘-----’ ”
11. Sel Image Size = 50%
12. Sel Image Quality = GOOD
13. ✓Resolution = 300
14. ✓Dots Per Inch selected
15. Sel OK

**DCS 760****3.1 CAMR FAILS TO FIRE**

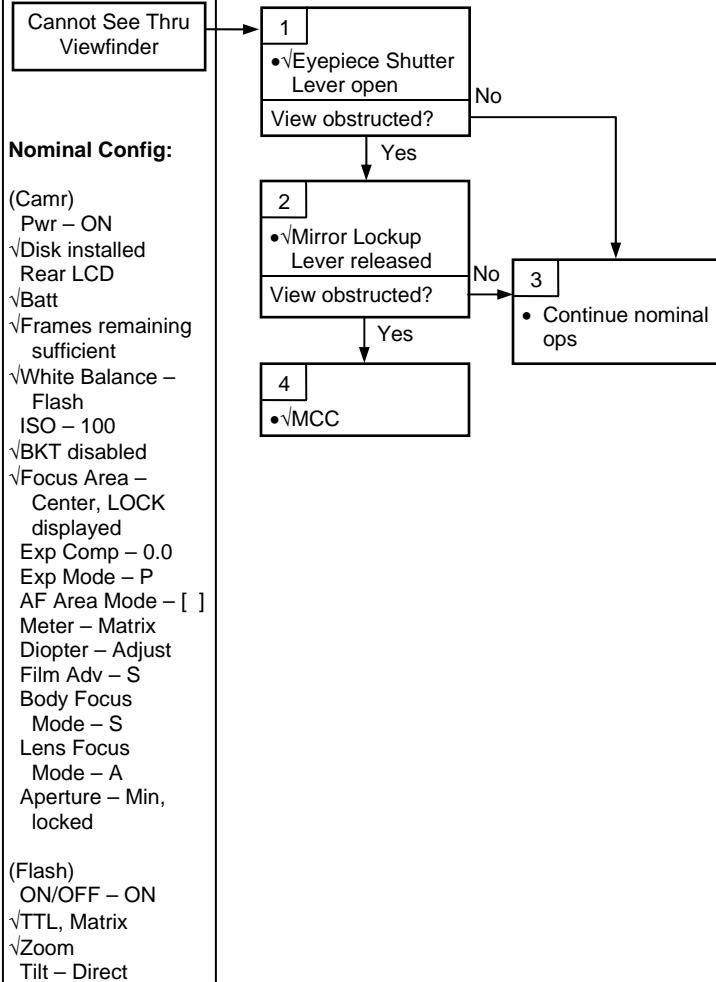
Camr Fails to Fire

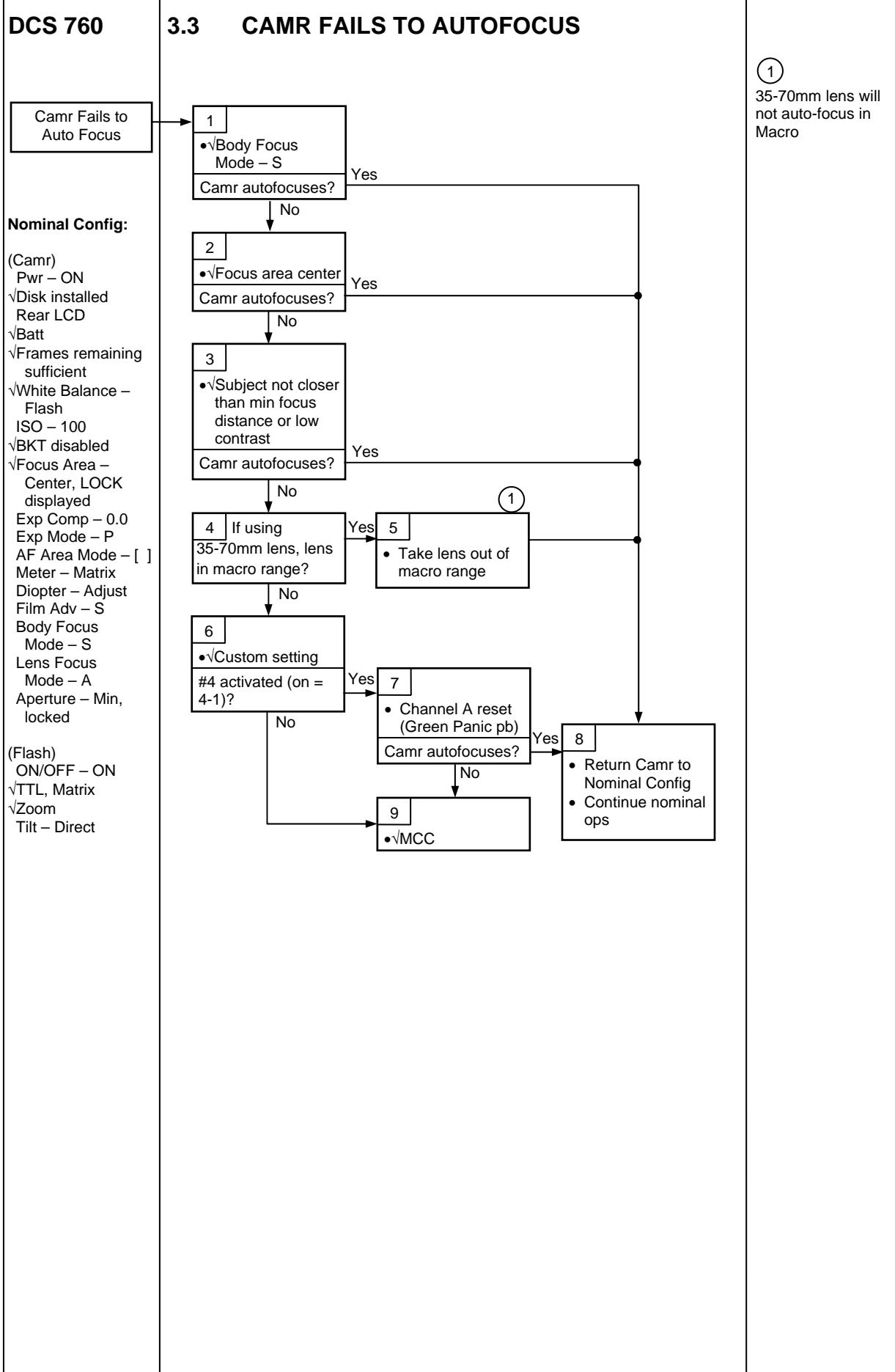
**Nominal Config:**

(Camr)  
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)  
ON/OFF – ON  
✓TTL, Matrix  
✓Zoom  
Tilt – Direct



## 3.2 CANNOT SEE THRU VIEWFINDER



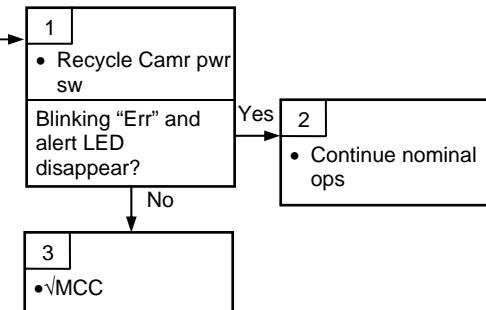


**DCS 760****3.4 “ERR” BLINKS ON TOP LCD AND ALERT LED ALSO BLINKS**

“Err” Blinks On  
Top LCD And  
Alert LED Also  
Blinks

**Nominal Config:**

(Camr)  
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)  
ON/OFF – ON  
✓TTL, Matrix  
✓Zoom  
Tilt – Direct



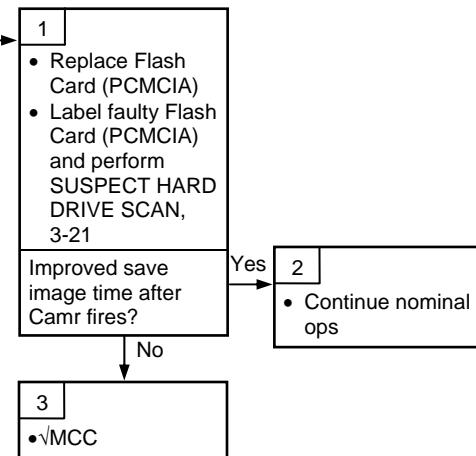
**DCS 760****3.5 EXCESSIVE SAVE IMAGE TO HARD DISK TIME**

Excessive Save Image to Hard Disk Time

**Nominal Config:**

(Camr)  
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)  
ON/OFF – ON  
✓TTL, Matrix  
✓Zoom  
Tilt – Direct



## DCS 760 EVA CAMR

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# DCS 760 EVA

## DCS 760 EVA CAMR

### 760 EVA – CAMR ONLY

#### NOTE

When Camr not in use during EVA, Thermal Lens Cap must be installed

#### 1. Unstow and assemble from EVA Camr Accessories Bag

DCS 760 Camr

Lens – As Rreqd

If 28(35,50,105)mm EVA Lens:

✓Circular Polar 52mm Filter w/o glass fully installed on lens

Action Viewfinder (EVA)

#### 2. Unstow but do not install

1 GB EVA Flash Cards (two)

EVA Camr Blanket

Camr Mounting Assy w/Thermal Blanket

#### 3. Config DCS Batt Charger Pwr Supply (one per Camr) per dwg at right

✓cb PWR IN – cl

✓OUT – cl

MAIN PWR – ON (LED on)

CAMR PWR – ON (LED on)

#### 4. Camr Settings

Pwr – ON

Install 1 GB EVA Flash Card in slot 1

Rear LCD

✓Frames Remaining ≥112

If <112, perform 760 QUICK FORMAT, 4-29

Remove 1 GB EVA Flash Card

Install second 1 GB EVA Flash Card in slot 1

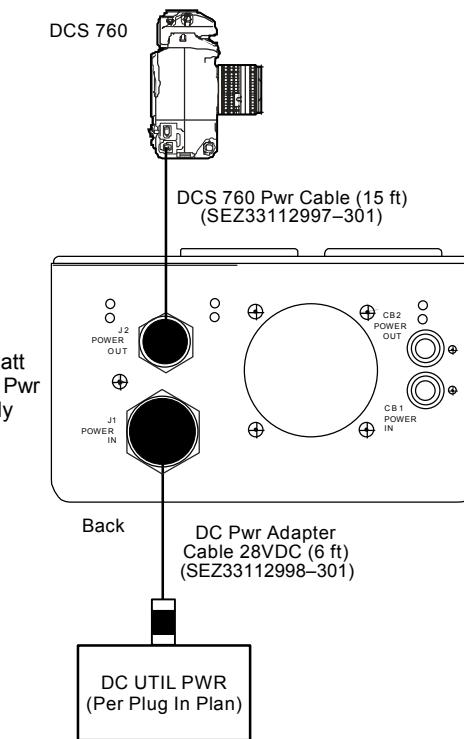
Rear LCD

✓Frames Remaining ≥112

If <112, perform 760 QUICK FORMAT, 4-29

Install first 1 GB EVA Flash Card in slot 2

✓White Balance – Flash



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## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR ONLY (Continued)**

DCS 760    4. Camr Settings (Concluded)

✓ISO – 100

✓Camr Bracket Disabled

Top LCD

✓Focus Area – Center, Locked

Exposure Comp – 0.0

Exposure Mode – P

Auto Focus Area Mode – [ ] (no “+” displayed)

Meter – Matrix

Film Advance – S

Body Focus Mode – S

Lens Focus Mode – A (if applicable)

Aperture – Min, locked

✓Vertical Shooting Shutter Release – Locked (L to line)

Main Menu

Menu pb – press

Main Menu – press OK

✓Processing – Off

✓Time/Date – GMT

Menu pb – press twice

Properties

Properties – press OK

Auto OK Errors – Yes

✓Enable Sharpening – No

High Temp Limit – Yes

✓Long Exposure Processing – Exposures >¼ sec

CANCEL pb – press twice

5. Remove Lens

#### NOTE

Do not pwr off Camr

DCS Batt  
Chgr    6. CAMR PWR – OFF (LED off)

7. Disconnect DCS 760 Pwr Cable from Pwr Adapter Connection on DCS 760 Camr

DCS 760    8. Install EVA Camr Blanket starting at right side of Camr and stopping short of covering Batt/PC Door

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR ONLY (Continued)**

9. ✓Aperture – Min, locked on lens
10. Install lens (EVA Camr Blanket may need to be adjusted)
11. ✓Lens Cap removed
12. Secure EVA Camr Blanket around lens
13. Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr
- DCS Batt      14. CAMR PWR – ON (LED on)
- Chgr
- DCS 760      15. Install DCS 760 Batt
16. Activate Shutter Release:
  - ✓No "FEE" in Viewfinder
    - If "FEE" displayed, go to step 9
  - ✓Lens moves freely under EVA Camr Blanket
17. Insert Light-Pipe thru Batt/PC Door into Card Busy LED opening
18. Test fire to confirm Light-Pipe operational – Blinking Red LED on EVA Camr Blanket
19. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
20. Complete EVA Camr Blanket installation (close Flaps 1,4)
21. Install Camr Mounting Assy w/Thermal Blanket from rear
22. ✓Camr Mounting Assy seated, will not slip off Camr. Release pb – out
23. Temp stow Flap 3 (will not be used for EVA)
24. Stow Camr until day of EVA

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR ONLY (Concluded)**

If Remote Cord Assy used:

25. Connect Remote Cord Assy to Remote Release port on DCS 760 Camr (Connector will thread into place)



26. ✓Remote Cord Assy not locked
27. Using Velcro, secure Flap 3 to EVA Camr Blanket (DO NOT snap Flap 3) (Optional)
28. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
29. Test fire DCS 760 Camr w/Remote Release
30. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

NOTE

Do not remove Camr from orbiter pwr

31. Stow until day of EVA

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR ONLY DISASSEMBLY**

#### BETWEEN EVAs

##### NOTE

Removal of Batts,Cards main objective

DCS 760

1. Detach Camr Mounting Assy from DCS 760
2. In order to access Batt/PC Door, open Flap 1 of EVA Camr Blanket
3. Remove Light-Pipe from Batt/PC Door
4. Open Batt/PC door:
  - Remove DCS 760 Batt
  - Remove 1 GB EVA Flash Cards (two)

#### POST-EVA

##### NOTE

Stowing of EVA H/W and IVA use of DCS 760 main objective

DCS 760

1. Remove Lens
2. If Remote Cord Assy used, disconnect from Remote Release Port on DCS 760 Camr. Disconnect Flap 3
3. Remove EVA Camr Blanket:
  - Open Flap 1 on EVA Camr Blanket
  - Uninstall Light-Pipe from DCS 760 Batt/PC Door
  - Remove EVA Camr Blanket from left to right
4. Temp stow EVA Camr Blanket
5. Replace lens
6. Camr Pwr – OFF
7. Open Batt/PC Door:
  - Remove DCS 760 Batt
  - Remove 1 GB EVA Flash Card (two)

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR ONLY DISASSEMBLY (Concluded)**

#### **POST-EVA** (Concluded)

If reqd:

8. Return Camr to Nominal Ops  
Replace DCS 760 Batt and 1 GB EVA Flash Card  
Camr Settings:  
    Camr Pwr – ON  
    Nom Ops settings:  
        Auto OK Errors – No  
        High Temp Limit – No  
        √Long Exposures Processing – Exposures > 1/4 sec  
    Camr Pwr – OFF  
Replace Action Viewfinder w/Nominal Viewfinder

## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/BRACKET ONLY

NOTE

When Camr not in use during EVA, Thermal Lens Cap must be installed

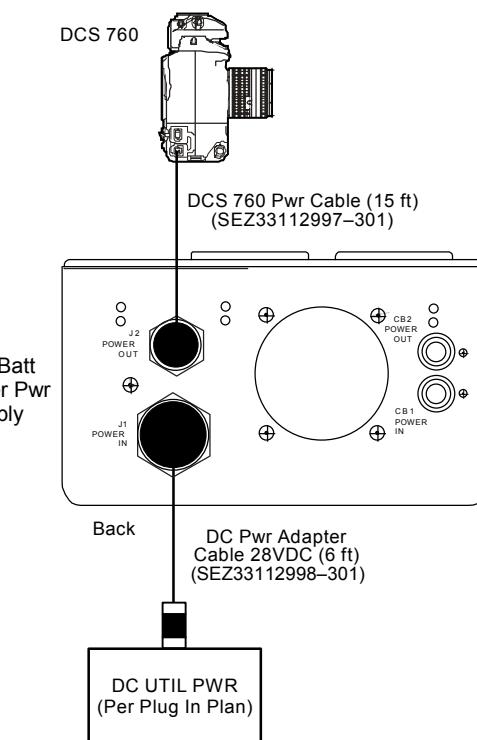
1. Unstow and assemble from EVA Camr Accessories Bag
  - DCS 760 Camr
  - Lens – As Rreqd
  - If 28(35,50,105)mm EVA Lens:
    - ✓Circular Polar 52mm Filter w/o glass fully installed on lens
  - Action Viewfinder (EVA)

2. Unstow but do not install
  - 1 GB EVA Flash Cards (two)
  - EVA Camr Blanket
  - Camr Mounting Assy w/Thermal Blanket
  - Flash Bracket w/Thermal Blanket
  - Remote Cord Assy (SED33112525-302) as reqd
3. Config DCS Batt Charger Pwr Supply (one per Camr) per dwg at right
  - ✓cb PWR IN – cl
  - ✓OUT – cl
  - MAIN PWR – ON (LED on)
  - CAMR PWR – ON (LED on)

MF71H

4. Camr Settings

- Pwr – ON
- Install 1 GB EVA Flash Card in slot 1
- Rear LCD
  - ✓Frames Remaining ≥112
  - If <112, perform 760 QUICK FORMAT, 4-29
- Remove 1 GB EVA Flash Card
- Install second 1 GB EVA Flash Card in slot 1
- Rear LCD
  - ✓Frames Remaining ≥112
  - If <112, perform 760 QUICK FORMAT, 4-29
- Install first 1 GB EVA Flash Card in slot 2
- ✓White Balance – Flash



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## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/BRACKET ONLY (Continued)**

#### INITIAL CAMR SETUP (Concluded)

DCS 760    4. Camr Settings (Concluded)

✓ISO – 100

✓Camr Bracket Disabled

Top LCD

✓Focus Area – Center, Locked

Exposure Comp – 0.0

Exposure Mode – P

Auto Focus Area Mode – [ ] (no “+” displayed)

Meter – Matrix

Film Advance – S

Body Focus Mode – S

Lens Focus Mode – A (if applicable)

Aperture – Min, locked

✓Vertical Shooting Shutter Release – Locked (L to line)

Main Menu

Menu pb – press

Main Menu – press OK

✓Processing – Off

✓Time/Date – GMT

Menu pb – press twice

Properties

Properties – press OK

Auto OK Errors – Yes

✓Enable Sharpening – No

High Temp Limit – Yes

✓Long Exposure Processing – Exposures >¼ sec

CANCEL pb – press twice

DCS 760    5. Remove Lens

#### NOTE

Do not pwr off Camr

DCS Batt    6. CAMR PWR – OFF (LED off)  
Chgr

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/BRACKET ONLY (Continued)**

- DCS 760
  - 7. Disconnect DCS 760 Pwr Cable from Pwr Adapter Connection on DCS 760 Camr
  - 8. Install EVA Camr Blanket starting at right side of Camr and stopping short of covering Batt/PC Door
  - 9. ✓Aperture – Min, locked on lens
  - 10. Install lens (Thermal Blanket may need to be adjusted)
  - 11. ✓Lens Cap removed
  - 12. Secure EVA Camr Blanket around lens
  - 13. Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr
  - 14. CAMR PWR – ON (LED on)
- DCS Batt Chgr
  - 15. Install DCS 760 Batt
  - 16. Activate Shutter Release:
    - ✓No "FEE" in viewfinder
      - If "FEE" displayed, go to step 9
    - ✓Lens moves freely under EVA Camr Blanket
  - 17. Insert Light-Pipe thru Batt/PC Door into Card Busy LED opening
  - 18. Test fire to confirm Light-Pipe operational – Blinking Red LED on EVA Camr Blanket
  - 19. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
  - 20. Complete EVA Camr Blanket installation (close Flaps 1,4)
  - 21. Obtain Bracket Assy w/Thermal Blanket
- Brkt Assy
  - If Thermal Blanket not installed, install on Bracket Assy:
    - Config Thermal Blanket for use w/o Flash

## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/BRACKET ONLY (Continued)

- EVA If Remote Cord Assy not configured for use w/Bracket Assy:
- 22. Temp stow Flap 3 (will not be used for EVA)
  - 23. Install DCS 760 Camr onto Bracket Assy (from front)



Mount for EVA Camr

Mount for Camr Mounting Assy (underneath)

- 24. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)
- 25. ✓DCS 760 Camr and Camr Mount seated, will not slip off Bracket Assy. Release pb – out

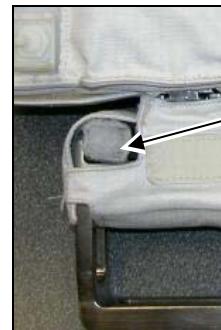
#### NOTE

Do not remove Camr from orbiter pwr

- 26. Stow until day of EVA

If Remote Cord Assy configured for use w/Bracket Assy:

- 27. Insert Remote Cord Assy thru hole in Thermal Blanket (verify Remote Cord Assy not locked) and place lip of remote under Thermal Blanket

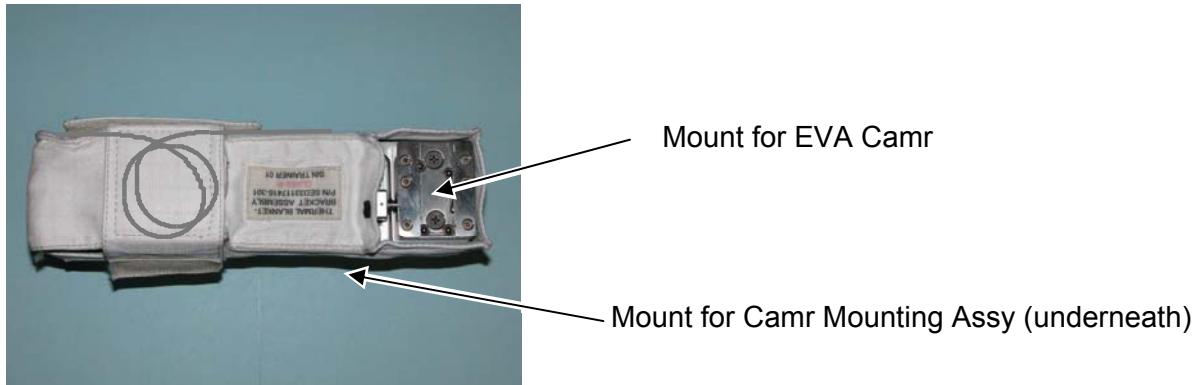


Remote Cord Lip

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/BRACKET ONLY (Continued)**

28. Coil excess cord and stow between mount for EVA Flash and Thermal Cover Flap



- DCS 760
29. Install DCS 760 Camr onto Bracket Assy (from front)
  30. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)

31.  DCS 760 Camr and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out
32. Remove Flap 3 from EVA Camr Blanket

Place Remote Cord Assy into Flap 3 per photo; close flaps



33. Using Velcro, secure Flap 3 to EVA Camr Blanket (DO NOT snap Flap 3)

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/BRACKET ONLY (Concluded)**

34. Connect Remote Cord Assy to Remote Release port on DCS 760 Camr (Connector will thread into place)



35. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
36. Test fire w/Remote Release (two shots)  
✓Shutter Release on Remote Cord Assy not locked
37. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

**NOTE**  
Do not remove Camr from orbiter pwr

38. Stow until day of EVA

## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/FLASH

#### NOTE

When Camr not in use during EVA, Thermal Lens Cap must be installed

1. Unstow and assemble from EVA Camr Accessories Bag
  - DCS 760 Camr
  - Lens – As Req'd
    - If 28(35,50,105)mm EVA Lens:
    - ✓Circular Polar 52mm Filter w/o glass fully installed on lens
  - Action Viewfinder

2. Unstow but do not install
  - 1 GB EVA Flash Cards (two)

EVA Camr Blanket  
 Camr Mounting Assy w/Thermal Blanket  
 Bracket Assy w/Thermal Blanket  
 EVA Flash w/Thermal Blanket  
 Flash Sync Cable Assy w/Thermal Blanket  
 Remote Cord Assy (SED33112525-302)  
 DCS EVA 7 VDC Pwr Cable

3. Config DCS Batt Charger Pwr Supply (one per Camr) per dwg at right
  - ✓cb PWR IN – cl
  - ✓OUT – cl
  - MAIN PWR – ON (LED on)
  - CAMR PWR – ON (LED on)

- DCS 760 4. Camr Settings

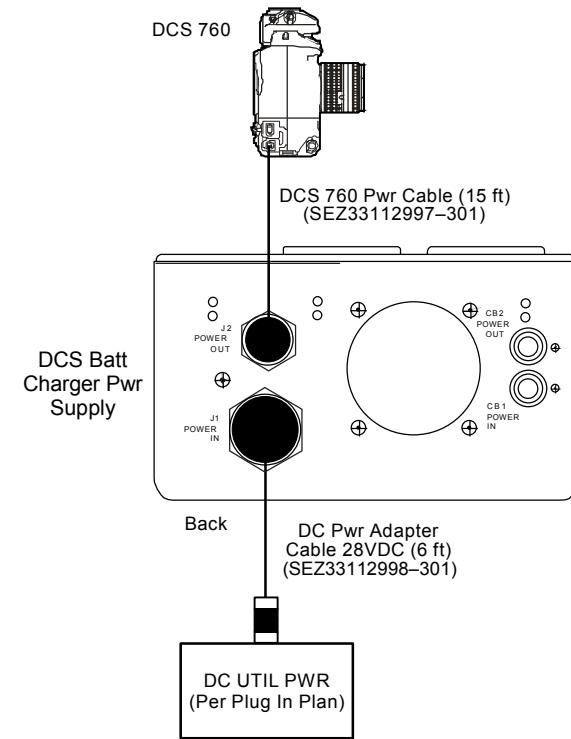
Pwr – ON  
 Install 1 GB EVA Flash Card in slot 1  
 Rear LCD
 

- ✓Frames Remaining ≥112
- If <112, perform 760 QUICK FORMAT, 4-29

 Remove 1 GB EVA Flash Card  
 Install second 1 GB EVA Flash Card in slot 1  
 Rear LCD
 

- ✓Frames Remaining ≥112
- If <112, perform 760 QUICK FORMAT, 4-29

 Install first 1 GB EVA Flash Card in slot 2
 ✓White Balance – Flash



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## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH (Continued)**

DCS 760    4. Camr Settings (Concluded)

✓ISO – 100

✓Camr Bracket Disabled

Top LCD

✓Focus Area – Center, LOCK

Exposure Comp – 0.0

Mode – P

Auto Focus Area Mode – [ ] (no "+" displayed)

Meter – Matrix

Film Advance – S

Body Focus Mode – S

Lens Focus Mode – A (if applicable)

Aperture – Min, locked

✓Vertical Shooting Shutter Release – Locked (L to line)

Main Menu

Menu pb – press

Main Menu – press OK

✓Processing – Off

✓Time/Date – GMT

Menu pb – press twice

Properties

Properties – press OK

Auto OK Errors – Yes

✓Enable Sharpening – No

High Temp Limit – Yes

✓Long Exposure Processing – Exposures >1/4 sec

CANCEL pb – press twice

5. Remove Lens

#### NOTE

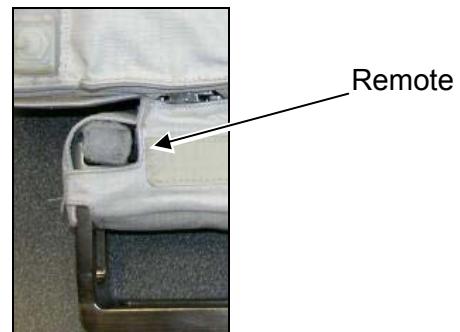
Do not pwr off Camr

DCS Batt    6. CAMR PWR – OFF (LED off)  
Chgr

## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/FLASH (Continued)

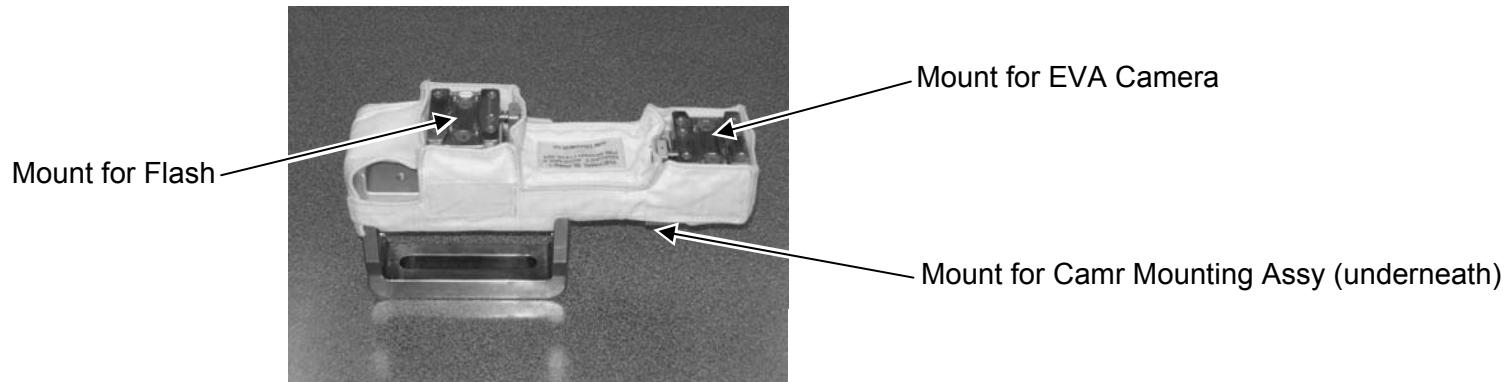
- DCS 760
7. Disconnect DCS 760 Pwr Cable from Pwr Adapter Connection on DCS 760 Camr
  8. Install EVA Camr Blanket starting at right side of Camr and stopping short of covering Batt/PC Door
  9. ✓Aperture – Min, locked on lens
  10. Install lens (EVA Camr Blanket may need to be adjusted)
  11. ✓Lens Cap removed
  12. Secure EVA Camr Blanket around lens
  13. Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr
  14. CAMR PWR – ON (LED on)
- DCS Batt Chgr
- DCS 760
15. Install DCS 760 Batt
  16. Activate Shutter Release:
    - ✓No "FEE" in Viewfinder
      - If "FEE" displayed, go to step 9
    - ✓Lens moves freely under EVA Camr Blanket
  17. Insert Light-Pipe thru Batt/PC Door into Card Busy LED opening
  18. Test fire to confirm Light-Pipe operational – Blinking Red LED on EVA Camr Blanket
  19. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
  20. Complete EVA Camr Blanket installation (close Flap 1)
  21. Obtain Bracket Assy w/Thermal Blanket
  - Brkt Assy
    - If Thermal Blanket not installed, install on Bracket Assy
  22. Insert Remote Cord Assy thru hole in Thermal Blanket (verify Remote Cord Assy not locked) and place lip of remote under Thermal Blanket



## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/FLASH (Continued)

- DCS 760
- 23. Remove Flash Sync Cover from Flash Sync Cable
  - 24. Install Flash Sync Cable to Camr Hot Shoe:
    - Lock Flash Sync Cable – turn lever cw
    - Secure Flap 4 to EVA Camr Blanket
  - 25. Reinstall Flash Sync Cover onto Flash Sync Cable Assy
  - 26. Secure Flash Sync Cable under Flap 2 on left side of Camr
  - 27. Install DCS 760 Camr onto Bracket Assy (from front)
  - 28. Install EVA Flash onto Bracket Assy (from rear)



- 29. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)
- 30. ✓DCS 760 Camr, EVA Flash, and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out

## **DCS 760 EVA CAMR (Continued)**

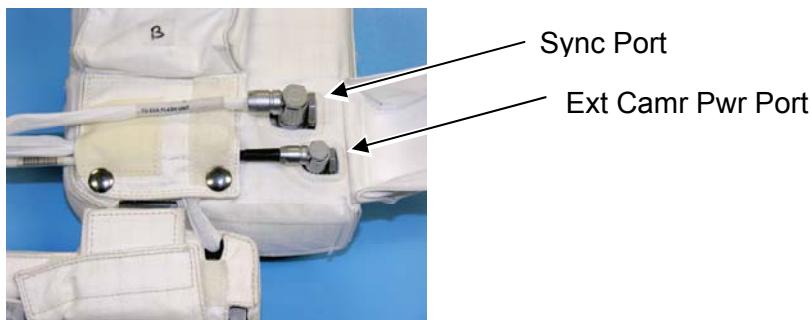
### **760 EVA – CAMR w/FLASH (Continued)**

- EVA Flash 31. Open Flaps A,B  
32. Under Flap B, tuck excess Remote Cord Assy (two coils) into pocket on EVA Flash unit



(Remote Cord Coil)

33. Connect DCS EVA 7 VDC Pwr Cable to Ext Camr Pwr port (small) on EVA Flash under Flap A
34. Run Remote Cord Assy and DCS EVA 7 VDC Pwr Cable under Flap B
35. Close Flap B using two snaps



## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH (Continued)**

- DCS 760    36. Connect Flash Sync Cable Assy to Flash Sync port on EVA Flash  
              37. Close Flap A over Flash Sync Cable Assy



**NOTE**

Adjustments to cables may be reqd during installation

38. Remove EVA Camr Blanket Flap 3 from EVA Camr Blanket  
Place Remote Cord Assy and DCS EVA 7 VDC Pwr Cable into Flap 3 per photo; close flaps

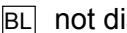


## DCS 760 EVA CAMR (Continued)

### 760 EVA – CAMR w/FLASH (Continued)

39. Using Velcro, secure Flap 3 to EVA Camr Blanket (DO NOT snap Flap 3)
40. Connect Remote Cord Assy to Remote Release port on DCS 760 Camr (Connector will thread into place)



- EVA Flash
41. Access Flash Batt Compartment (remove Flap(s) C as reqd)
  42. Remove Batt Cap
  43. Install one DCS 760 Batt into FLASH slot (align arrows)
  44. Reinstall Batt Cap
  45. Flash – ON
  46. Activate Camr
  47. Open Flap D; verify following:
    - ✓Mode –  If  not displayed, press viewfinder Forward
    - ✓Zoom – “M” not displayed  
If “M” displayed, contact MCC
- DCS 760
48. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
  49. Test fire Camr w/Flash using Remote Release (two shots)
  50. ✓Flash fired
- EVA Flash
51. Flash – OFF
  52. Close Flap D
  53. Remove DCS 760 Batt from FLASH slot
- DCS 760
54. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)



NOTE  
Do not remove Camr from orbiter pwr

55. Stow until day of EVA

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH (Concluded)**

#### PRIOR TO ENTERING AIRLOCK:

- EVA Flash
1. Remove Batt Cap
  2. Install two DCS 760 Batts into CAMERA,FLASH slots (align arrows)
  3. Reinstall Batt Cap
  4. Flash – ON
  5. Activate Camr
  6. Open Flap D; verify following:

- ✓ Mode – 
- If  not displayed, press viewfinder Forward
- ✓ Zoom – “M” not displayed  
If “M” displayed, contact MCC

- DCS 760
7. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
  8. Test fire Camr w/Flash

- EVA Flash
9. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

- DCS Batt Chgr
10. Flash – OFF
  11. Close Flap D
  12. Close Flap C

- DCS 760
13. CAMR BATT PWR – EXT
  14. Camr Pwr – off

- DCS 760
15. Disconnect DCS 760 Pwr Cable
  16. Connect DCS EVA 7 VDC Pwr Cable to Camr (flat side fwd)
  17. Secure snap on Flap 3 to EVA Camr Blanket



## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH DISASSEMBLY**

#### BETWEEN EVAs

##### NOTE

Removal of Batts,Cards main objective

#### FLASH

1. Flash – OFF
2. Open Flap C to access Flash Batt compartment
3. Remove Batt Cap
4. Remove DCS 760 Batts (two)
5. Install Batt Cap
6. Close Flap C

#### CAMR

1. Remove Flap 3 snap from EVA Camr Blanket
2. Disconnect Remote Cord Assy and DCS EVA 7 VDC Pwr Cable from DCS 760 Camr
3. Detach Flap 3 from EVA Camr Blanket
4. Disconnect Flash Sync Cable Assy from Camr Hot Shoe:  
    Unlock Flash Sync Cable Assy – turn ccw
5. Remove Flash Sync Cable Assy from under Flap 2 on left side of Camr
6. Detach Camr Mounting Assy from Bracket Assy
7. Detach DCS 760 Camr from Bracket Assy
8. In order to access Batt/PC Door, open Flap 1 of EVA Camr Blanket
9. Remove Light-Pipe from Batt/PC Door
10. Open Batt/PC door:  
    Remove DCS 760 Batt  
    Remove 1GB EVA Flash Cards (two)

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH DISASSEMBLY (Continued)**

#### POST-EVA

##### NOTE

Stowing of EVA H/W and IVA use of DCS 760 main objective

#### CAMR w/FLASH

1. Remove snap on Flap 3 from EVA Camr Blanket
2. Disconnect Remote Cord Assy and DCS EVA 7 VDC Pwr Cable from DCS 760 Camr
3. Detach Flap 3 from EVA Camr Blanket
4. Remove Remote Cord Assy and DCS EVA 7 VDC Pwr Cable from Flap 3
5. Secure Flap 3 to DCS EVA Camr Blanket
6. Disconnect Flash Sync Cable Assy from Camr Hot Shoe:  
    Unlock Flash Sync Cable Assy – turn ccw
7. Remove Flash Sync Cable Assy from under Flap 2 on left side of Camr
8. Detach Camr Mount from Bracket Assy
9. Detach DCS 760 Camr from Bracket Assy

#### CAMR

1. Remove Lens
2. Remove EVA Camr Blanket:  
    Open Flap 1 on EVA Camr Blanket  
    Uninstall Light-Pipe from DCS 760 Batt/PC Door  
    Remove EVA Camr Blanket from left to right
3. Temp stow EVA Camr Blanket
4. Replace lens
5. Camr Pwr – OFF
6. Open Batt/PC Door:  
    Remove DCS 760 Batt  
    Remove 1 GB EVA Flash Cards (two)

## **DCS 760 EVA CAMR (Continued)**

### **760 EVA – CAMR w/FLASH DISASSEMBLY (Concluded)**

#### POST-EVA (Concluded)

##### EVA FLASH AND FLASH BRACKET

1. Flash – OFF
2. Open Flap C to access Flash Batt compartment
3. Open Batt Cap and remove DCS 760 Batts (two)
4. Secure Batt Cap
5. Close Flap C
6. Open Flaps A,B
7. Remove Remote Cord Assy, Flash Sync Cable and DCS EVA 7 VDC Pwr Cable from Flap B
8. Disconnect Flash Sync Cable Assy from Flash
9. Disconnect EVA 7 VDC Pwr Cable from Flash
10. Close Flaps A,B
11. Remove EVA Flash from Bracket Assy
12. Remove Remote Cord Assy from Thermal Blanket
13. Temp Stow EVA Flash and Bracket Assy w/Thermal Blanket

##### RETURN CAMR TO NOM OPS (as reqd)

1. Replace DCS 760 Batt and 1 GB EVA Flash Card
2. Camr Settings:  
    Camr Pwr sw – ON  
    Nom Ops settings:  
        Auto OK Errors – No  
        High Temp Limit – No  
        ✓Long Exposures Processing – Exposures > 1/4 sec
3. Camr Pwr – OFF
4. Replace Action Viewfinder w/Nominal Viewfinder

## **DCS 760 EVA CAMR (Continued)**

### **SPECIFICATIONS**

#### CAMR BODY

CCD SIZE: 18.48mm x 27.65mm

PIXEL COUNT: 2008 x 3032

DISK/FRAME: 1 GB: 112 Frames

FILE SIZE: 6 MB

EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual

METER PATTERN: 3D Color Matrix, Center Weighted, Spot

EXPOSURE COMP:  $\pm 5$  in 1/3 stops

SHUTTER:

Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)

Manual & Shutter Priority – 1/8000 thru 30 sec (1/3 stop increments), and B (manual only)

ISO Setting:

Manual: 80-400

MOTOR DRIVE: Single, C<sub>H</sub> (1.5 fps), C<sub>L</sub> (1.0 fps), C<sub>S</sub> (1.0 fps)

Interval: 10-25 shot burst

CAMR BATT: Rechargeable

CAMR BATT VOLTAGE: 7.2V

CAMR BATT LIFETIME: ~100 frames

CAMR WEIGHT: 4.09 lb (w/batt & PCMCIA)

## DCS 760 EVA CAMR (Continued)

### LENS DATA

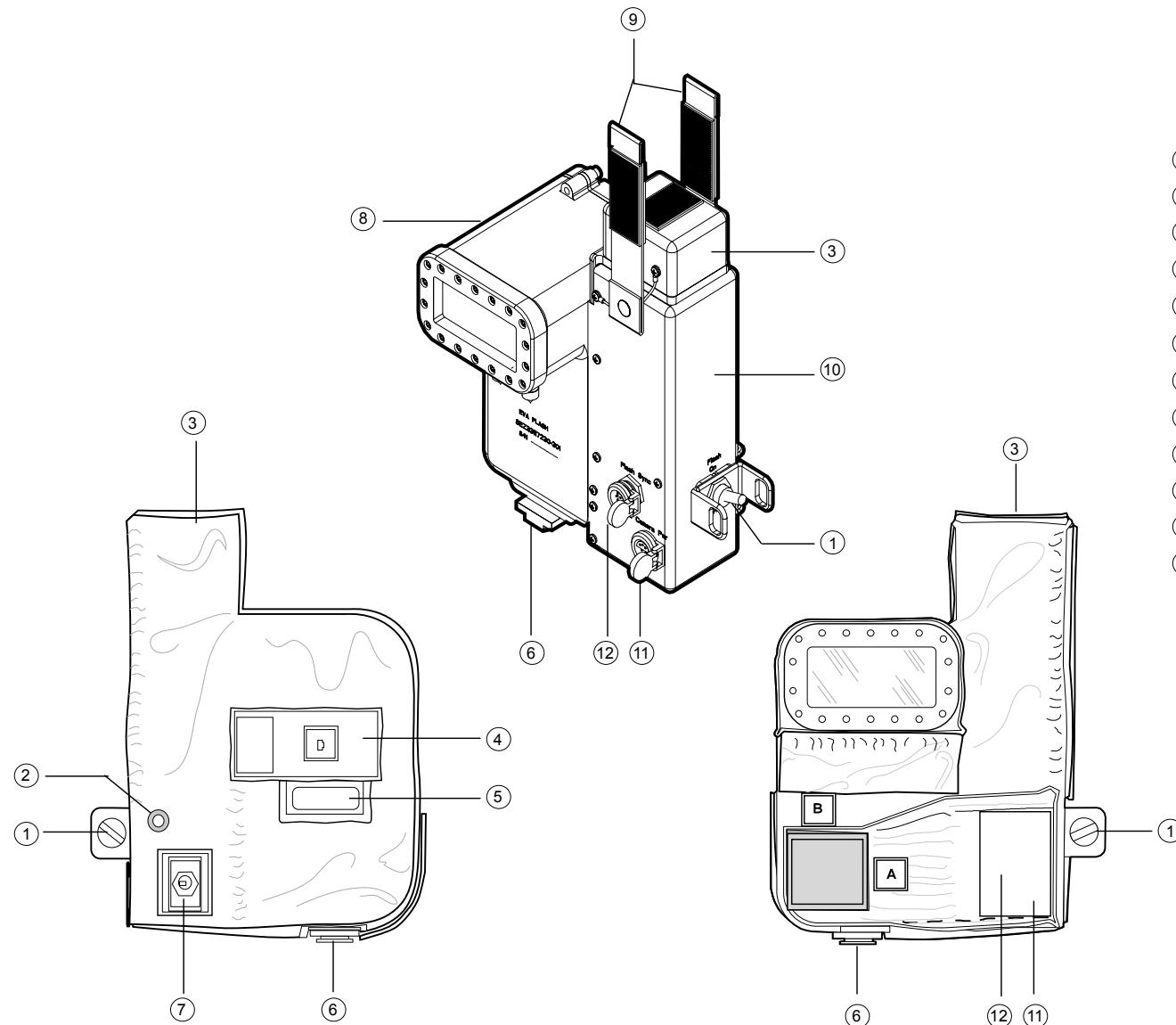
NOTE

Do not use non-EVA lens w/DCS 760 EVA

Lens	Aperture Range (f/stop)	Approximate Field of View (FOV)			Approx Minimum Focus Distance (ft)	Weight (lb)	Filter Size	M-A Sw	Focus Limit Sw
		Horizontal	Vertical	Diagonal					
28mm AF	f/2.8-f/22	53°	37°	61°	1.25	0.46	52mm		
35mm AF	f/2.0-f/22	43°	30°	51°	0.9	0.51	52mm		
50mm AFD	f/1.4-f/16	31°	21°	37°	1.5	0.59	52mm		
85mm AF	f/1.8-f/16	19°	12°	22°	3.0	0.93	62mm	Yes	
105mm AF	f/2.8-f/32	15°	10°	18°	1.0	1.22	52mm	Yes	
180mm AFD	f/2.8-f/22	9°	6°	11°	5.0	1.72	72mm	Yes	
70-200mm AFD	f/2.8-f/22	20°-8°	13°-5°	24°-10°	6.0	2.98	77mm	Yes	

## DCS 760 EVA CAMR (Continued)

### NOMENCLATURE



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## **DCS 760 EVA CAMR (Continued)**

### **DATE/TIME SET**

1. MENU pb – press
2. Navigate pad – sel Menu icon , then MAIN MENU
3. OK pb – press
4. Navigate pad – sel TIME/DATE
5. OK pb – press

#### NOTE

Set TIME/DATE to GMT

6. Navigate pad – sel desired field (left,right)
7. Navigate pad – sel desired setting (up,down)
8. OK pb – press

## **DCS 760 EVA CAMR (Continued)**

### **760 QUICK FORMAT**

#### NOTE

Only one card may be in Camr while formatting

1. Pwr – ON
2. MENU pb – press
3. Navigate pad – sel Menu icon , then MAIN MENU
4. OK pb – press
5. Navigate pad – sel ‘Card’
6. OK pb – press
7. Navigate pad – sel ‘Quick Format’
8. OK pb – press
9. ‘Format card? (All data will be erased)’
10. OK pb – press
11. ‘Are you sure you want to erase the card?’
12. OK pb – press
13. ‘Formatting Card’
14. ‘Card format complete’
15. OK pb – press
16. CANCEL pb – press

## **DCS 760 EVA CAMR (Continued)**

### **760 FULL FORMAT**

#### **1. Perform DCS BATT CHARGING (BATTS & FUSES)**

##### **NOTE**

Pwr Camr from vehicle and batt to ensure completion of formatting.  
Only one card may be in Camr while formatting

2. Pwr – ON
3. MENU pb – press
4. Navigate pad – sel Menu icon , then MAIN MENU
5. OK pb – press
6. Navigate pad – sel ‘Card’
7. OK pb – press
8. Navigate pad – sel ‘Full Format’
9. OK pb – press
10. ‘Format card? (All data will be erased)’
11. OK pb – press
12. ‘Are you sure you want to erase the card?’
13. OK pb – press

##### **NOTE**

Formatting will take approx 20 min

14. ‘Formatting Card’ will be displayed w/progress bar
15. ‘Card format complete. No bad clusters found’
16. OK pb – press
17. CANCEL pb – press

## **DCS 760 EVA CAMR (Continued)**

### **760 FIRMWARE UPDATE**

#### PGSC

1. Insert PCMCIA 1 GB MICRO DRIVE into PGSC
2. Copy 'DCS7XX.bin' to root directory of PCMCIA 1 GB MICRO DRIVE
3. Remove PCMCIA 1 GB MICRO DRIVE from PGSC

#### CAMR

1. Install fresh Batt
2. Install PCMCIA 1 GB MICRO DRIVE w/loaded Firmware
3. Power – ON
4. MENU pb – press
5. Navigate pad – sel Menu icon , then MAIN MENU
6. OK pb – press
7. Navigate pad – sel 'Firmware'
8. OK pb – press
9. Navigate pad – sel 'Update from Card'
10. OK pb – press
11. 'Loading firmware file from card'
12. 'Firmware update will take about 15 seconds'
13. OK pb – press
14. 'Updating firmware'
15. 'Firmware update complete. Turn camera off and on to restart'
16. OK pb – press
17. PWR – OFF
18. PWR – ON
19. 'New firmware version loaded 3.3.11'
20. ✓Version number 3.3.11

#### NOTE

Process must be completed two times to update both Firmware slots

21. OK pb – OK
22. Repeat steps 4-21, then go to step 23
23. PWR – OFF

## **DCS 760 EVA CAMR (Continued)**

### **DATA LOG FILE PROCEDURE**

#### CREATING LOG FILE

1. MENU pb – press
2. Navigate pad – sel Menu icon , then MAIN MENU
3. OK pb – press
4. Navigate pad – sel ‘Firmware’
5. OK pb – press
6. Navigate pad – sel ‘Version’
7. OK pb – press
8. MENU pb – press, hold
9. OK pb – press
10. ‘Saving log file’ – displayed
11. ‘Log file saved’ – displayed (log file saved in root directory)
12. OK pb – press
13. Cancel pb – press twice to turn off display
14. Dnlk imagery and log file

## **DCS 760 EVA CAMR (Continued)**

### **BLANK IMAGE**

#### CAMR SETTINGS – ACTIVATION

##### NOTE

Camr must be pwrd off for 30 min prior to performing Blank Image procedure

Install Body(Lens) Cap  
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 – M  
    SS – 30  
AF Area Mode – [ ] (no "+")  
Meter – Matrix  
Diopter – Adjust  
Film Adv – S  
Body Focus Mode – M  
Aperture – Min, locked ('--' displayed on top LCD when no Lens installed)  
Flash Settings  
    ON/OFF – OFF

#### TECHNIQUE

1. Fire Camr
2. Note image number (number in brackets on rear LCD)
3. Rcd audio file to denote "blank image taken"
4. Transfer image to PGSC for dnlk to MCC-H

#### CAMR SETTINGS – DEACTIVATION

Exp Mode – P  
Body Focus Mode – S  
Flash Settings  
ON/OFF – ON

## DCS 760 EVA CAMR (Concluded)

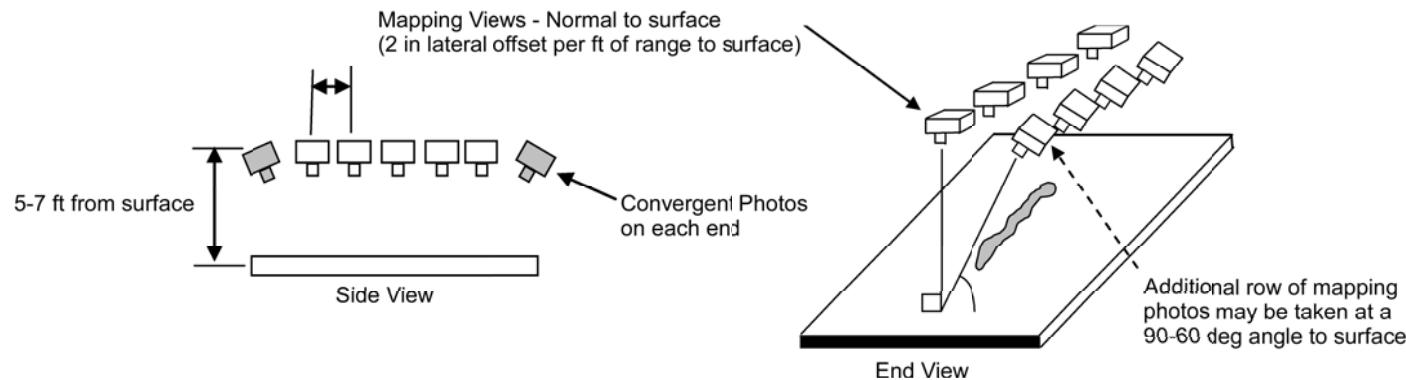
### STEREO PHOTGRAMMETRY PROCEDURE

#### CAMR SETTINGS – ACTIVATION

1. Rcd CAMR and LENS S/Ns
2. Perform EVA – CAMR ONLY(CAMR w/BRACKET ONLY,CAMR w/FLASH)
3. Install Lens – 50mm EVA (preferred)  
Exp Mode – P  
Flash Settings:  
ON/OFF – OFF

#### TECHNIQUE

1. Distance to subject: 5-7 ft
2. Take mapping images normal to surface, followed by one additional convergent view on each side
3. Shoot photos in pairs. Offset each image laterally 2 in/ft of subject distance, ~10-14 in
4. An additional row of photos may be taken at a 90-60 deg angle to surface to capture critical details not covered in previous images
5. Repeat as time permits



#### CAMR SETTINGS – DEACTIVATION

1. Exp Mode – P  
Body Focus Mode – S  
Flash Settings:  
ON/OFF – ON

EVA IR CAMR

|

NOTE  
Not being flown

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SPOTMETER 303

NOTE  
Not being flown

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## SONY PD100

### PAGE

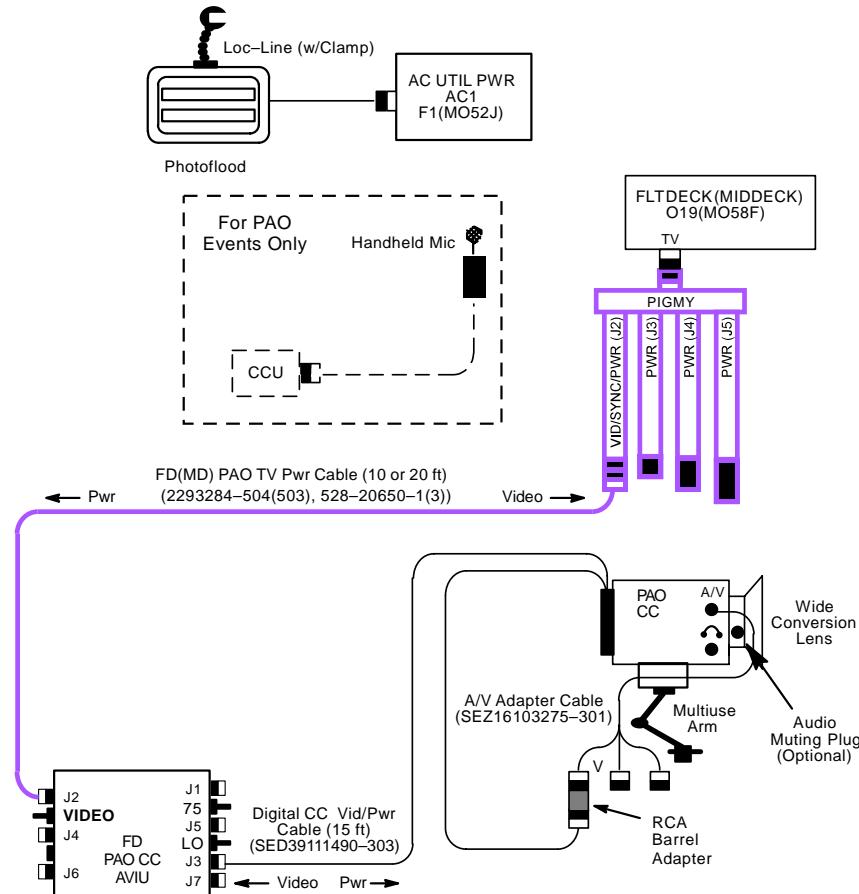
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# SONY PD100

## SONY PD100

### ANALOG 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 (not W6 CC) PWR – 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 Install Audio Muting Plug (optional) Multiuse Brkt, Clamp
F1(MO52J)	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 angle for best framing
CCU	CCU PWR – ON
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
A7	When ready for dnlk: ✓TV DNLK – ENA PWR CNTL – PNL CONTR UNIT – MNA(B) CNTL – CMD (wait 10 sec for system initialization) VID OUT DNLK pb – push IN FLT DECK(MIDDECK) pb – push

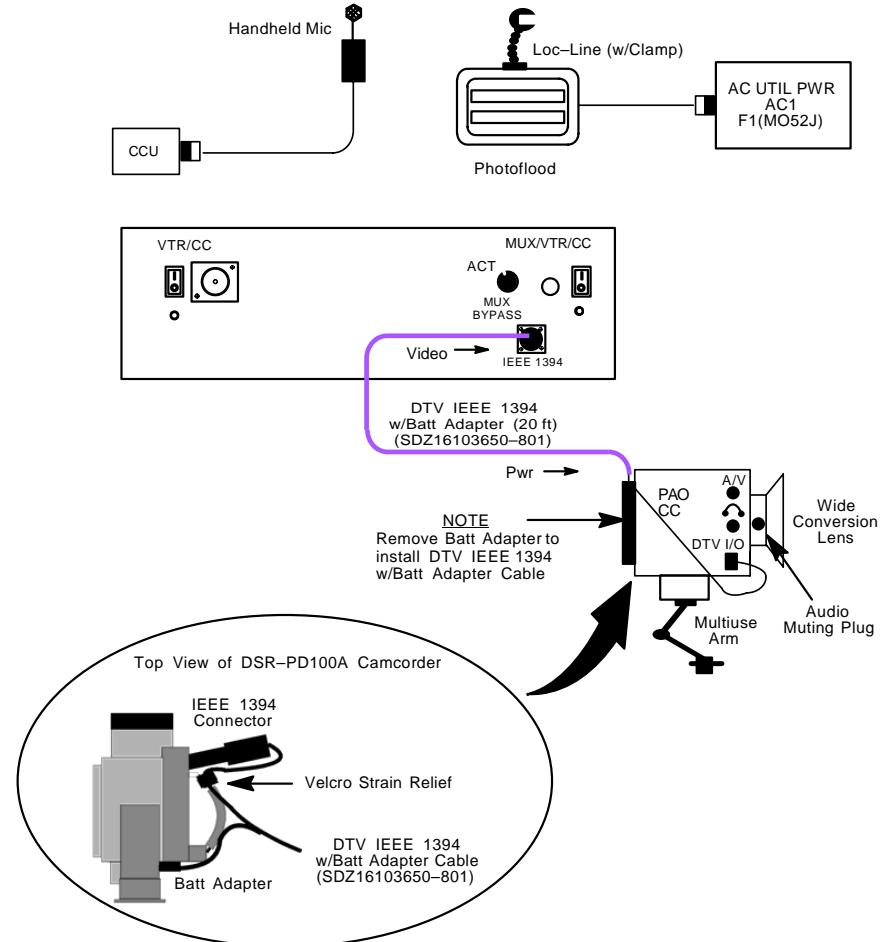


jsc48037\_117\_007.csv

## SONY PD100 (Continued)

### DIGITAL PAO CC

- Config H/W per dwg at right
- To compose scene but not dnlk:  
VTR/CC PWR – on (LED on)
- L10 (MUX)  
CC ✓Wide Conversion lens installed  
PWR – 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  
Install Audio Muting Plug  
Multiuse Brkt, Clamp
- F1(MO52J)  
Photoflood AC UTIL PWR AC1 – ON  
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 angle for best framing
- CCU CCU PWR – ON
- 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
- L10 (MUX) When ready to dnlk signal:  
| MUX/VTR/CC PWR – on (LED on)  
| ✓MUX BYPASS – ACT  
| ✓CHANNEL 3 DATA LED – on

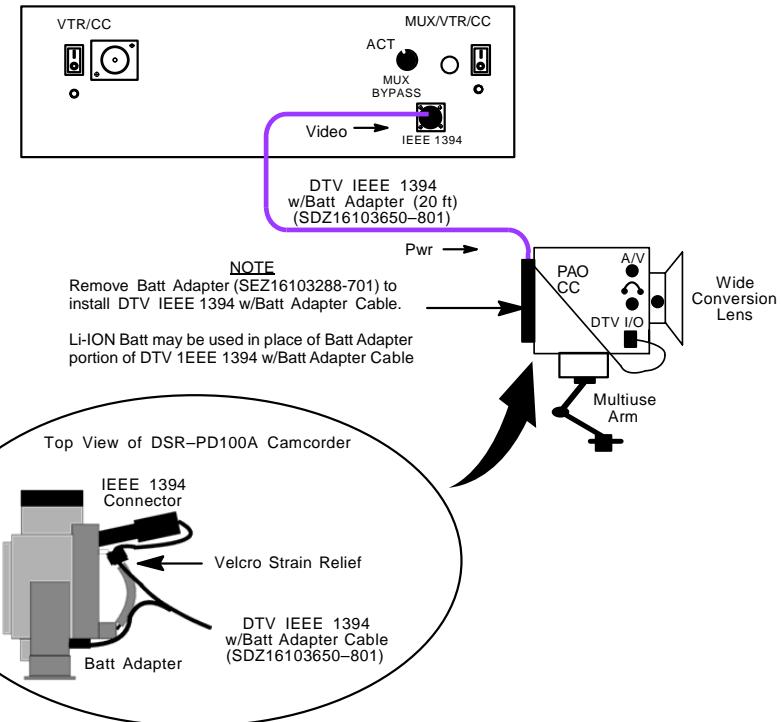


jsc48037\_117\_009.csv

## SONY PD100 (Continued)

### MINIDV DIGITAL TAPE DNLK

- L10 (MUX)      Config H/W per dwg at right  
Notify MCC of digital dnlk  
✓VTR/CC PWR – on (LED on)
- CC                PWR – VTR  
Open REC/SAVE tab on MiniDV Tape (Red showing)  
Tape – install  
VTR pb – REW(FF) to cue tape
- L10 (MUX)        For Dnlk:  
                  MUX/VTR/CC PWR – on (LED on)  
                  ✓MUX BYPASS – ACT
- CC                PLAY pb – push (green ▶ displayed)  
L10 (MUX)        ✓CHANNEL 3 DATA LED – on
- CC                If PLBK(DNLK) complete:  
                  | STOP pb – push  
If CC ops complete:  
                  MUX/VTR/CC PWR – off (LED off)  
                  VTR/CC PWR – off (LED off) as reqd  
                  Remove,mark,stow tape as reqd  
                  PWR – OFF  
                  Config CC for nominal FD ops



jsc48037\_117\_010.csv

## **SONY PD100 (Continued)**

### **SPECIFICATIONS**

TAPE: Mini DVCAM Cassette

TAPE LENGTH: 40 min

SENSING AREA: 1/4-in Color CCD (three) (5.08mm Horizontal, 3.81mm Vertical, 6.35mm Diagonal)

VIEWFINDER: Color

LCD: Color, 3.5 in

ZOOM: 12X, 48X Digital Zoom

FOCAL LENGTH: 4.3mm to 51.6mm

APERTURE: f/1.6-2.6 - f/11

MICROPHONE: Built-in Stereo Electric Condenser

AUDIO: 16-Bit at 48KHz

MINIMUM ILLUMINATION: 4 Lux at f/1.6

POWER: 7.2V Batt

8.4V DC IN

BATT LIFETIME: ~60 min

BODY WEIGHT: 2.5 lb

BATT WEIGHT: 0.41 lb

### **WIDE ANGLE CONVERTER**

CONVERSION: 0.7X

CONVERTED FOCAL LENGTH: 3.01mm to 36.2mm

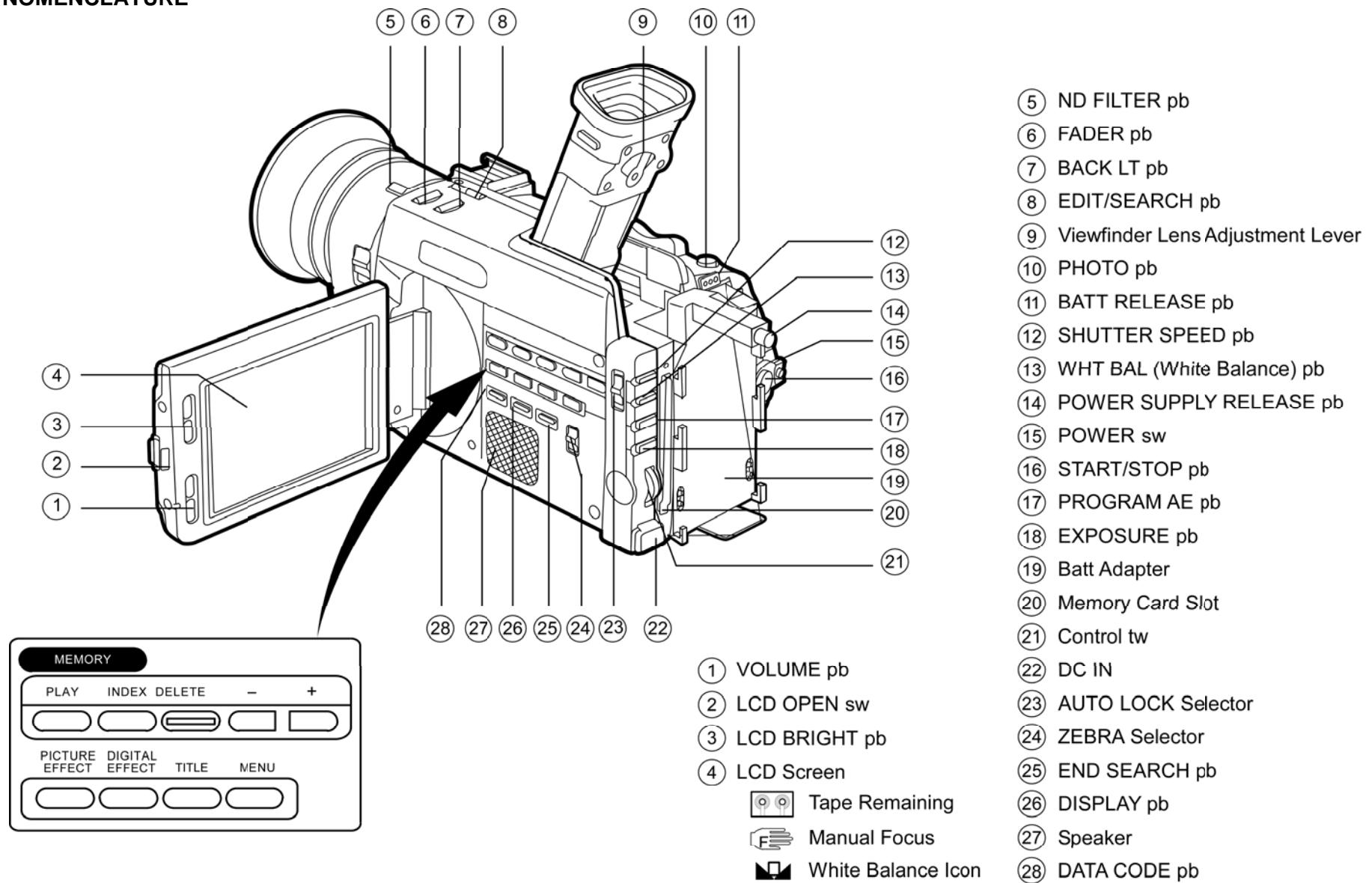
WEIGHT: 0.53 lb

### **LENS DATA**

Lens	Zoom Ratio	Approximate Field of View			Filter Size
		Horizontal	Vertical	Diagonal	
4.3-51.6mm	12:1	61.1°-5.6°	47.8°-4.2°	72.9°-7.0°	52mm
w/Wide Conversion Lens 3.0-36mm	12:1	80.3°-8.0°	64.7°-6.0°	93.1°-10.0°	N/A

## SONY PD100 (Continued)

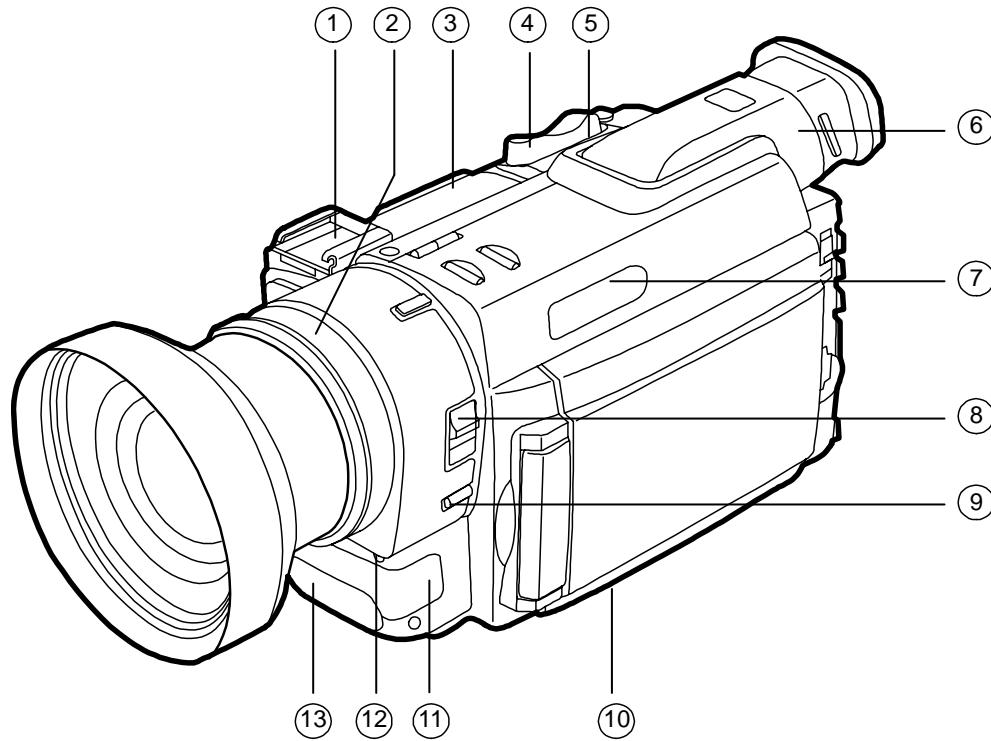
### NOMENCLATURE



jsc48037\_025r2.csv

## SONY PD100 (Continued)

### NOMENCLATURE (Continued)

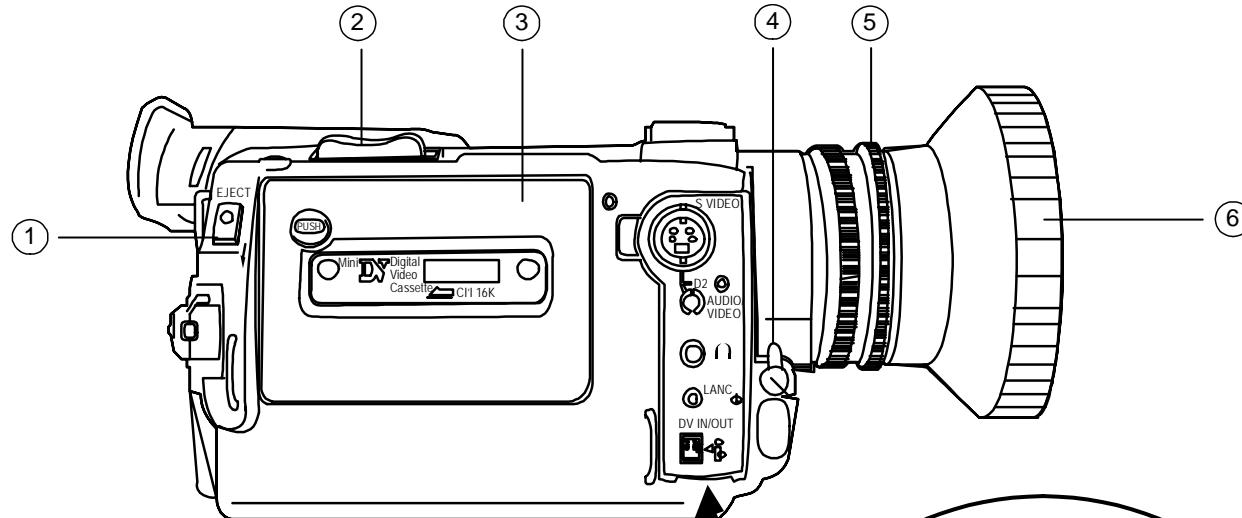


- ① Accessory Shoe
- ② Focus Ring
- ③ Tape Transport pbs
  - STOP (stop)
  - ◀ REW (rewind)
  - ▶ PLAY (playback)
  - ▶ FF (fast forward)
  - II PAUSE (pause)
  - REC (record)
- ④ Zoom Control
- ⑤ TC RESET pb
- ⑥ Viewfinder
- ⑦ Display Window
- ⑧ FOCUS sw
- ⑨ PUSH AUTO pb
- ⑩ Memory Release pb (not visible)
- ⑪ Built-in Microphone
- ⑫ REC Lamp
- ⑬ Remote Sensor

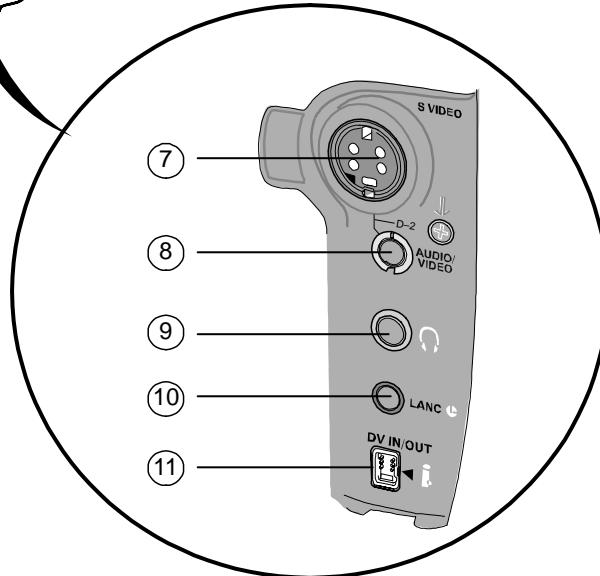
jsc48037\_026.cnv

## SONY PD100 (Continued)

### NOMENCLATURE (Continued)



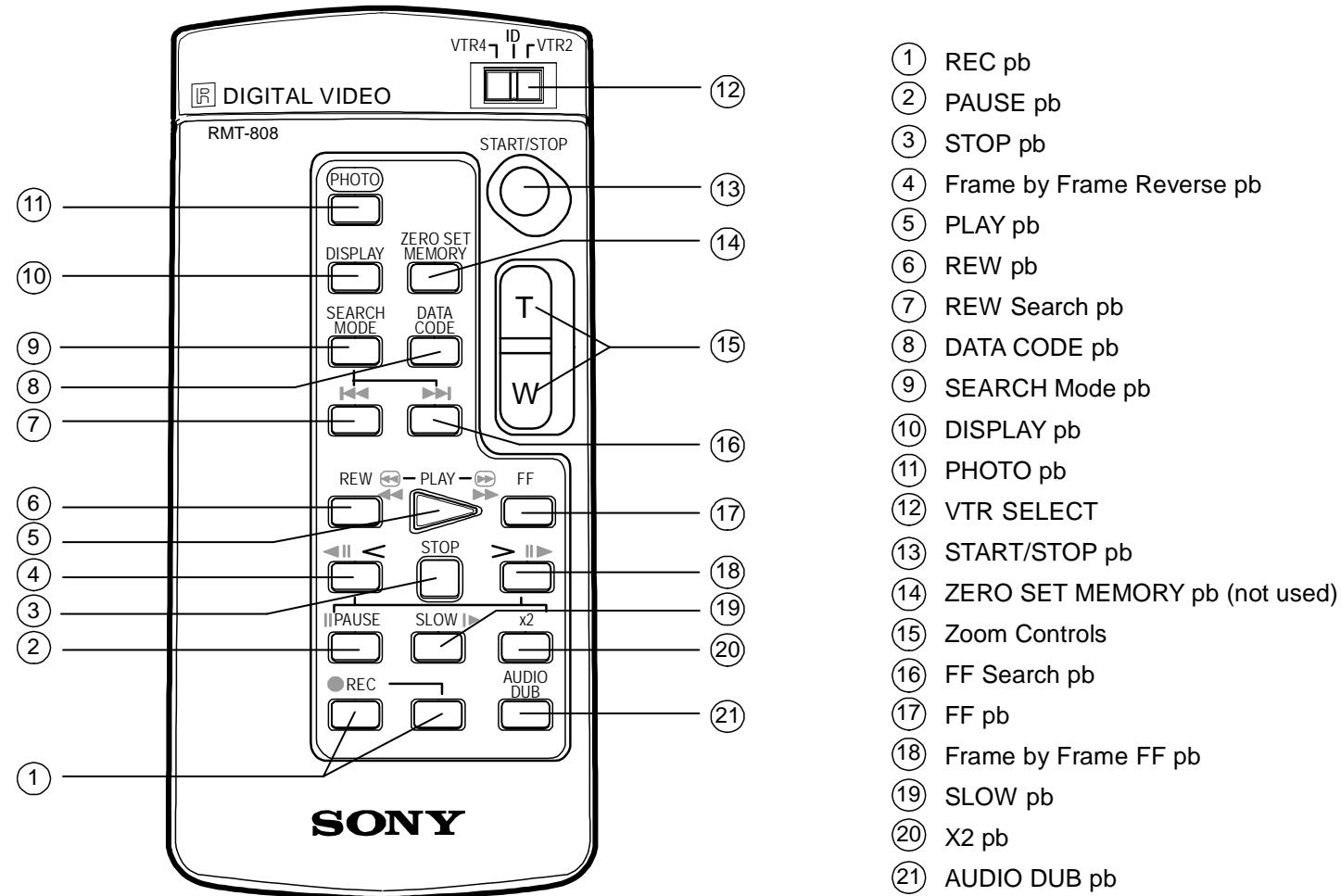
- ① Cassette Eject
- ② Zoom Control
- ③ Cassette Compartment
- ④ MIC PLUG-IN Pwr
- ⑤ Wide Conversion Locking Collar
- ⑥ Wide Conversion Lens
- ⑦ S VIDEO Jack
- ⑧ AUDIO/VIDEO Jack
- ⑨ Headphone Jack
- ⑩ LANC Jack
- ⑪ DV IN/OUT Jack



jsc48037\_027.cnv

## SONY PD100 (Continued)

### NOMENCLATURE (Concluded)



jsc48037\_028.cnv

## **SONY PD100 (Continued)**

### **NOMINAL MENU SETTINGS**

#### **CAMR MODE**

##### MANUAL SET

AUTO SHUTTER – ON  
PROG SCAN – OFF

##### CAMR SET

D.ZOOM – OFF  
16:9 WIDE – OFF  
STEADYSHOT – ON  
AE SHIFT – “center”  
GAIN SHIFT – 0dB  
FRAME REC – OFF  
INT REC – OFF

##### LCD/VF SET

LCD B.L. – BRT Normal

##### CM SET

N/A

##### TAPE SET

AUDIO MODE – FS48K  
MIC LEVEL – AUTO  
 REMAIN – ON  
TIME CODE – DF

##### SETUP MENU

CLOCK SETUP – set per GMT  
LTR SIZE – NORMAL

##### OTHER

WORLD TIME – 0  
BEEP – NORMAL  
COMMANDER – ON  
DISPLAY – LCD  
REC LAMP – ON  
COLOR BAR – OFF

#### **VTR MODE**

##### VTR SET

HiFi SOUND – STEREO  
AUDIO MIX – “left” (ST1)

##### LCD/VF SET

LCD COLOR – “center”  
VF BRIGHT – “center”

##### MEMORY SET

N/A

##### CM SET

N/A

##### TAPE SET

AUDIO MODE – FS48K  
MIC LEVEL – AUTO  
 REMAIN – ON  
DATA CODE – DATE/CAM  
TIME CODE – DF

##### SETUP MENU

LTR SIZE – NORMAL

##### OTHER

BEEP – NORMAL  
COMMANDER – ON  
DISPLAY – LCD  
DV EDITING – N/A

## **SONY PD100 (Continued)**

### **MANUAL SETTINGS**

#### **FOCUS**

##### MANUAL FOCUS

PWR – CAMERA

FOCUS sw – MANUAL ( display in viewfinder (LCD))

Zoom – IN to subject

Focus manually

Zoom to desired setting

Begin recording as reqd

##### TEMP AUTO FOCUS

PUSH AUTO pb – press,hold for temp Auto Focus

#### **APERTURE**

PWR – CAMERA

AUTO LOCK – “center”

PROGRAM AE pb – press

 displayed

CONTROL tw – press

Adjust aperture as reqd

To exit Aperture:

PROGRAM AE pb – press

 displayed

#### **SHUTTER**

PWR – CAMERA

AUTO LOCK – “center”

SHUTTER SPD pb – press

CONTROL tw – Rotate to select SS from 1/4 to 1/10,000 sec

To exit Shutter Speed:

SHUTTER SPEED pb – press

 displayed

#### **WHITE BALANCE**

PWR – CAMERA

Camr Settings

AUTO LOCK – “center”

WHT BAL pb – press

To set WHT BAL, place white sheet of paper in CC FOV

(under same lighting conditions)

CONTROL tw – press

White Balance icon  will blink for 2 sec and become steady

To exit WHT BAL:

WHT BAL – press

## SONY PD100 (Continued)

### PD100 TO PD100 VIA FIREWIRE

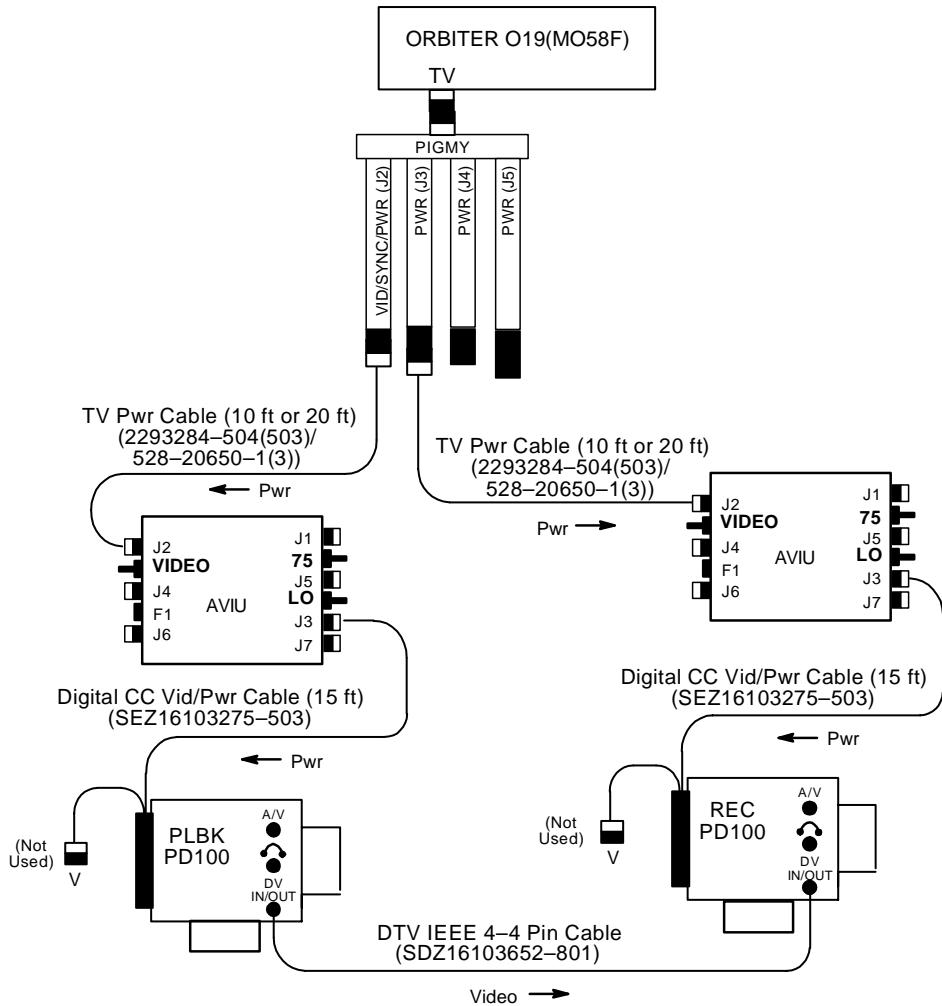
Config H/W per dwg at right

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

PLBK CC    PWR – VTR  
DISPLAY pb – push  
Install source tape. Protect Tab – Slide (red visible)  
PLAY pb – push  
Cue tape to desired take  
PAUSE pb – push

RCD CC     PWR – VTR  
DISPLAY pb – push  
Install new tape

PLBK CC    MENU pb – push  
Sel ETC(OTHERS)/DV EDITING  
Perform following for each video segment:  
Sel IN to mark beginning of video clip  
FF pb – push to move to end of video clip  
Sel OUT to mark end of video clip



jsc48037\_029.cnv

## SONY PD100 (Continued)

### PD100 TO V10 VIA FIREWIRE

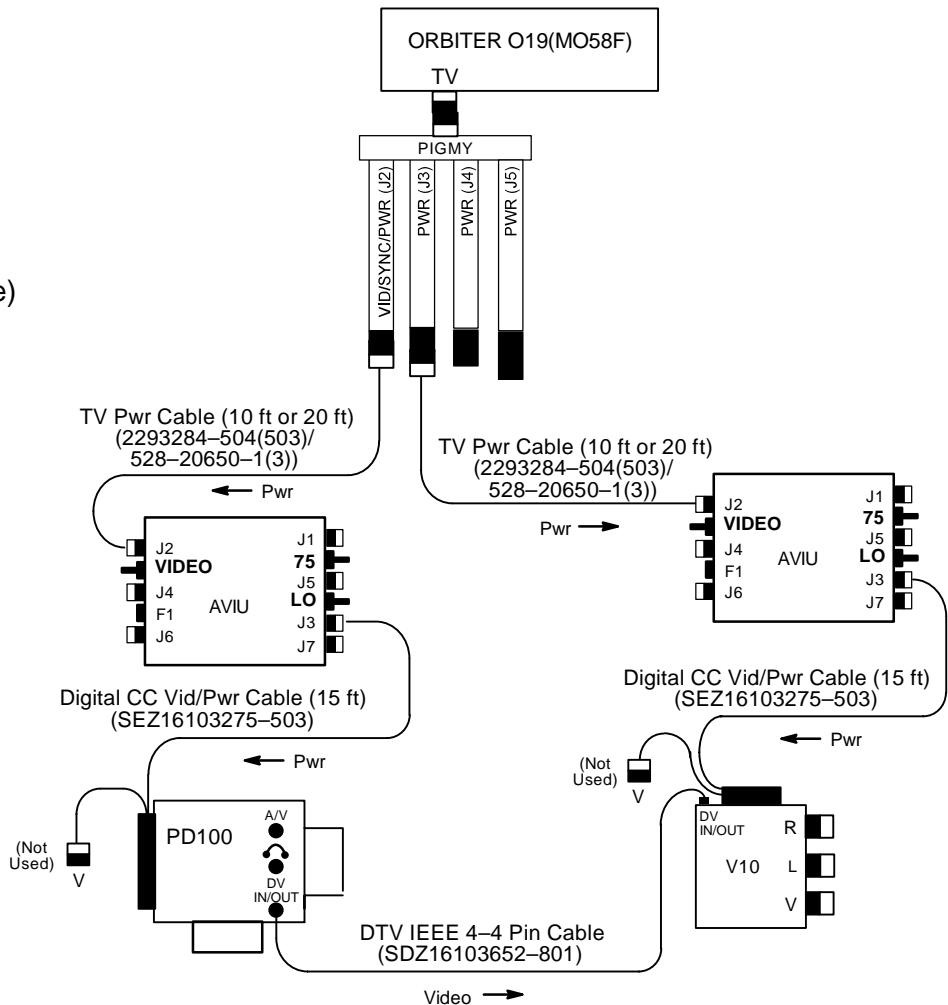
Config H/W per dwg at right

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

CC      PWR – VTR  
DISPLAY pb – push  
Install source tape. Protect Tab – Slide (red visible)  
PLAY pb – push  
Cue tape to desired take  
PAUSE pb – push

V10      PWR – ON  
DISPLAY pb – push  
Install new tape

CC      MENU pb – push  
Sel ETC(OTHERS)/DV EDITING  
Perform following for each video segment:  
Sel IN to mark beginning of video clip  
FF pb – push to move to end of video clip  
Sel OUT to mark end of video clip



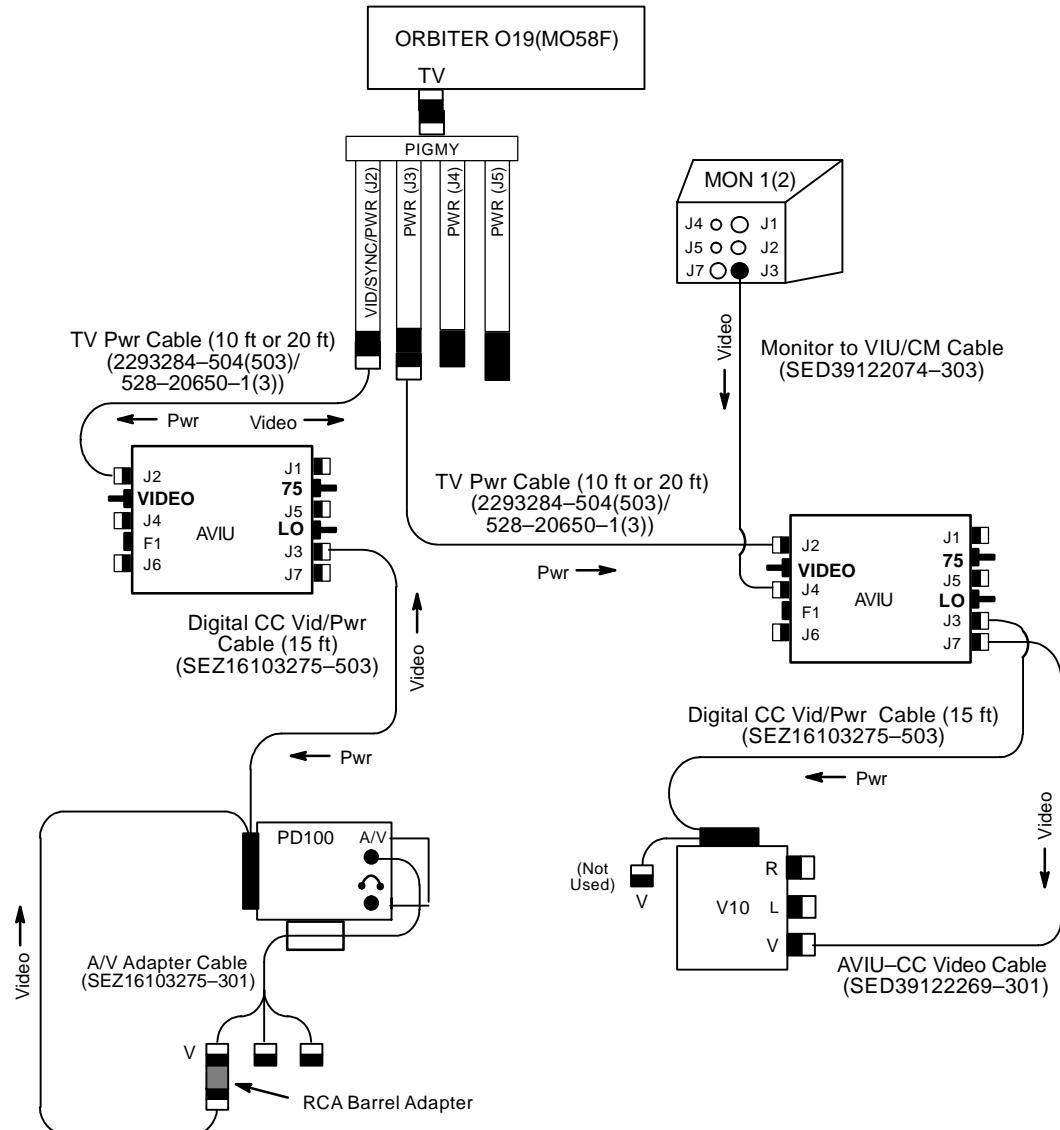
jsc48037\_030r1.csv

## SONY PD100 (Continued)

### PD100 TO V10 VIA ORBITER TV SYSTEM

Config H/W per dwg at right  
 √Orbiter in async mode

AVIU	SYNC/VIDEO – VIDEO HI-Z/75 – 75 PWR SELECT – LO
CC	PWR – VTR DISPLAY pb – push Install source tape. Protect Tab – Slide (red visible) PLAY pb – push Cue tape to desired take PAUSE pb – push
V10	PWR – ON DISPLAY pb – push Install new tape REC pb – push PAUSE pb – push
A7	VID OUT MON 1(2) pb – push IN FLT DECK(MIDDECK) pb – push
CC V10	Perform following for each video segment: PAUSE pb – push (To PLAY) PAUSE pb – push (To REC) When EDIT segment complete: PAUSE pb – push (PAUSE) PAUSE pb – push (PAUSE)
CC V10	



jsc48037\_031.cnv

## SONY PD100 (Continued)

### PD100 TO DSR-20 VTR

Config H/W per dwg at right

L10  
(MUX)  
(VTR)

- ✓VTR/CC PWR – on (LED on)
- ON/STBY pb – push (green LED on)
- INPUT SELECT – push twice to change from VIDEO to DV
- Install new tape

CC

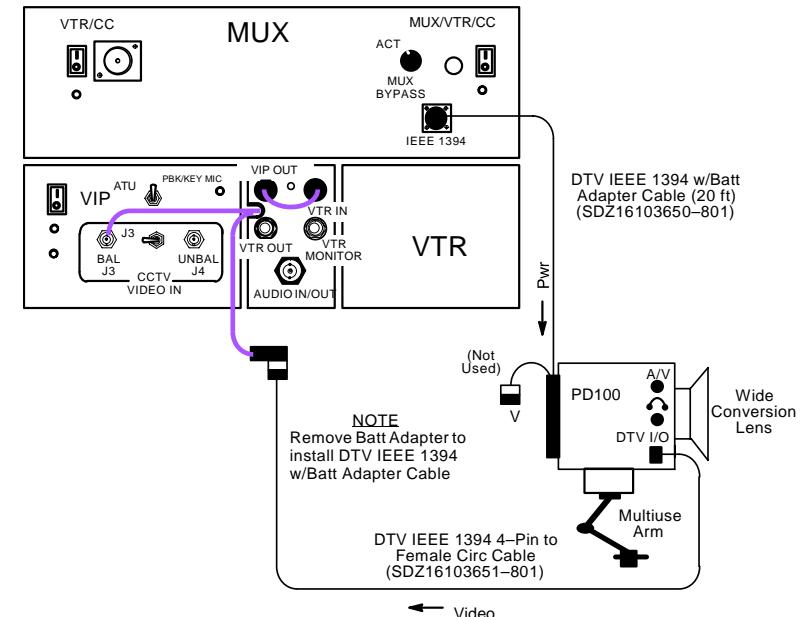
- PWR – VTR
- DISPLAY pb – push
- Install source tape
- Cue tape to desired take
- PAUSE pb – push
- MENU pb – push
- Sel ETC(OTHERS)/DV EDITING
- Perform following for each video segment:
  - Sel IN to mark beginning of video clip
  - FF pb – push to move to end of video clip
  - Sel OUT to mark end of video clip

L10  
(VTR)

When complete:

- INPUT SELECT – push once to change from DV to VIDEO
- Remove,mark tape
- ON/STBY pb – push (red LED on)
- Remove,stow IEEE 1394 female cable
- VTR/CC PWR – off (LED off) as reqd
- Reconnect IEEE 1394 male cable to IEEE 1394 connector

(MUX)



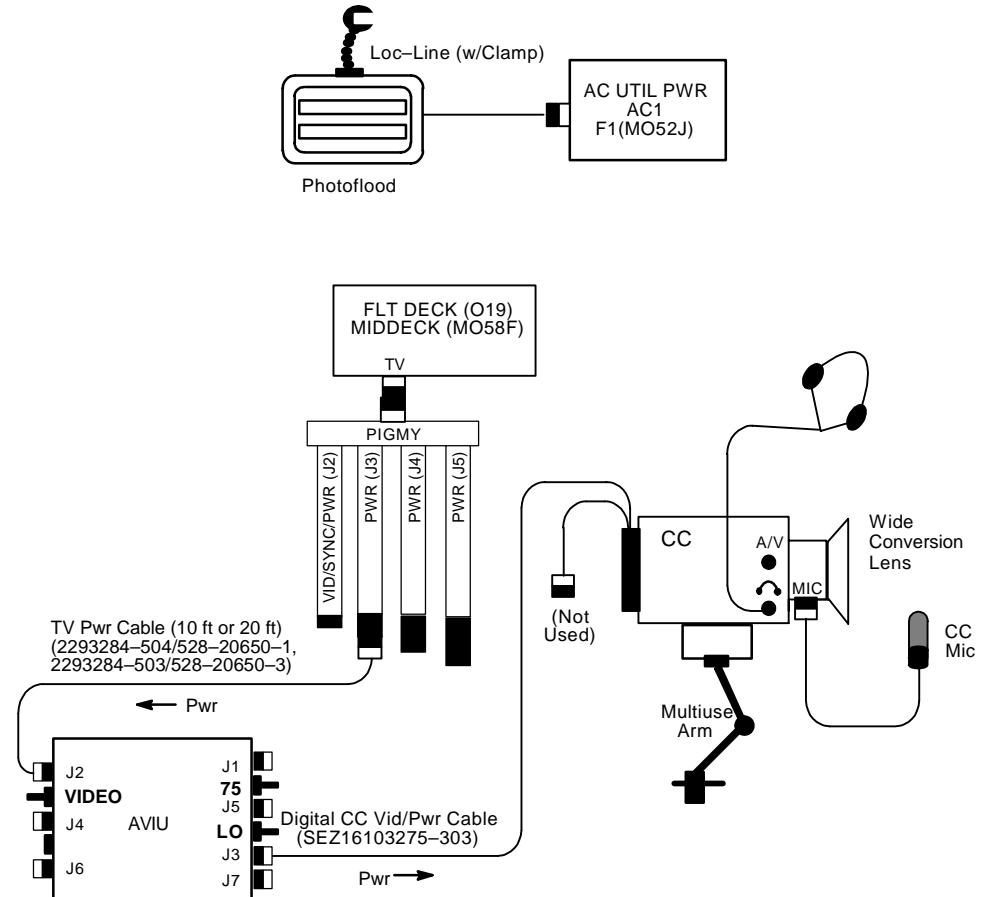
jsc48037\_117\_008.cvx

## SONY PD100 (Concluded)

### SINGLE CAMCORDER w/CAMCORDER MICROPHONE

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 PWR – CAMERA Tape – Install ✓Viewfinder(LCD) displays STBY Camr Settings ✓AUTO LOCK – AUTO LOCK ✓FOCUS – AUTO Multiuse Brkt, Clamp
Lav Mic	ON/OFF – ON
F1 (MO52J)	AC UTIL PWR AC1 – ON
Photoflood	ON/OFF – ON HI/LO – HI
Cabin Lts	Flt Deck(Middeck) – ON Lts in FOV – Off as reqd Lt Shades – install as reqd
CC	✓Scene Composition Adjust Camr for best framing ✓Audio Quality



jsc48037\_033.cnv

## SONY V10

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I

# SONY V10

## SONY V10

### V10 FROM MON 1

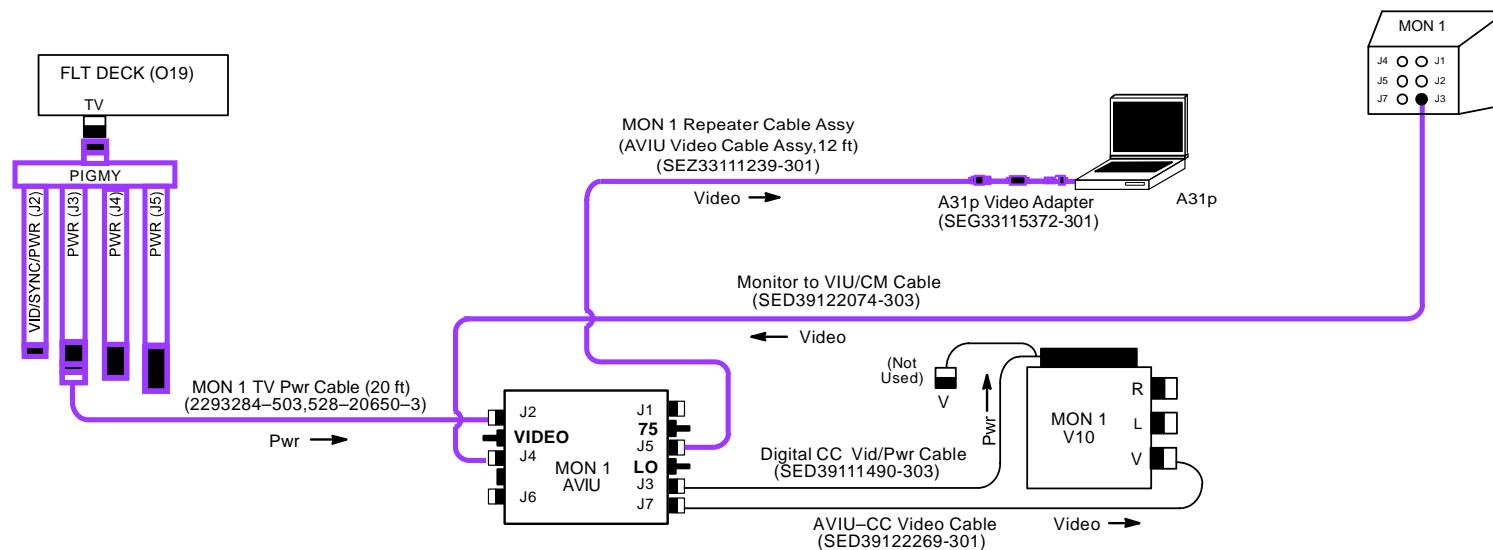
Config H/W per dwg below

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

O19      √TV PWR – ON

V10      PWR – ON  
DISPLAY pb – Toggle to display tape counter  
Tape – Install

**FOR A31p AS MON**  
Perform A31p VIDEO CONVERTER (PHOTO/TV, PORTABLE MONITORS)



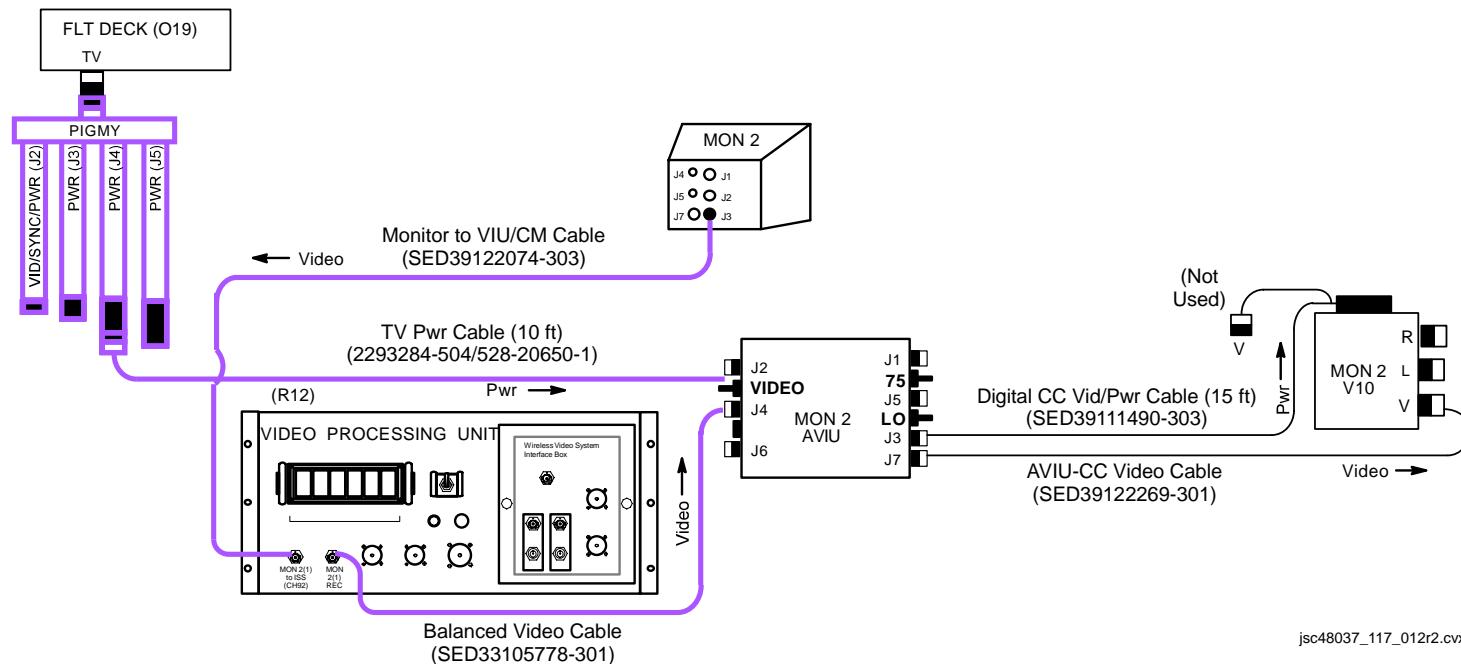
jsc48037\_117\_011r1.cvx

## SONY V10 (Continued)

### V10 FROM MON 2

Config H/W per dwg below

- |      |   |
|------|---|
| AVIU | SYNC/VIDEO – VIDEO<br>HI-Z/75 – 75<br>PWR SELECT – LO                     |
| O19  | $\sqrt{V}$ TV PWR – ON  |
| V10  | PWR – ON<br>DISPLAY pb – Toggle to display tape counter<br>Tape – Install |
| R12  | VPU PWR – ON (LED on)   |



jsc48037\_117\_012r2.cvx

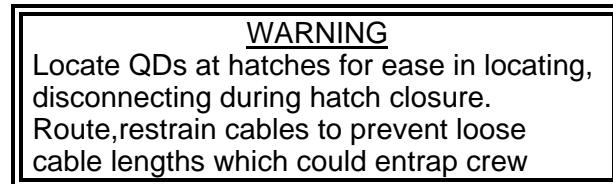
## SONY V10 (Continued)

### RWS V10 FROM WVS

✓RWS 1 connected to XCVR1 UNBAL

✓RWS 2 connected to XCVR2 UNBAL

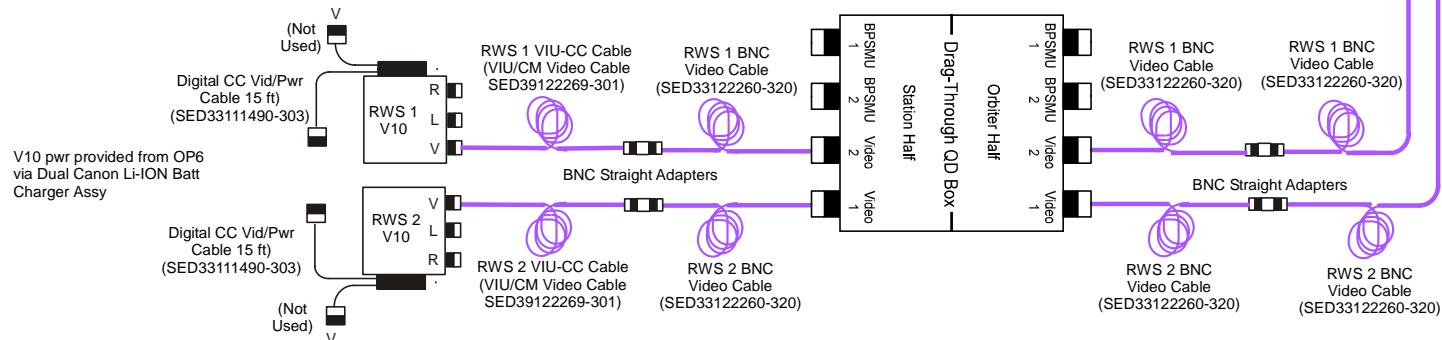
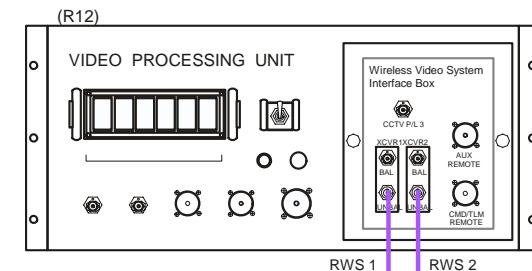
Config H/W per dwg below



✓Pwr configured per P/TV121 DOCKED OPERATIONS, dwg USOS 120VDC – V10 VTRs (SODF: PHOTO/TV: SCENES)

V10

PWR (RWS 1,RWS 2) – ON

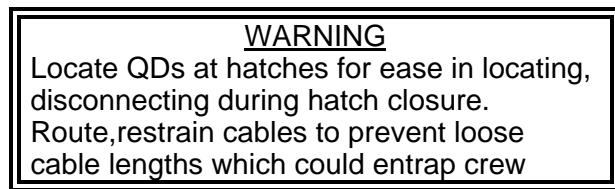


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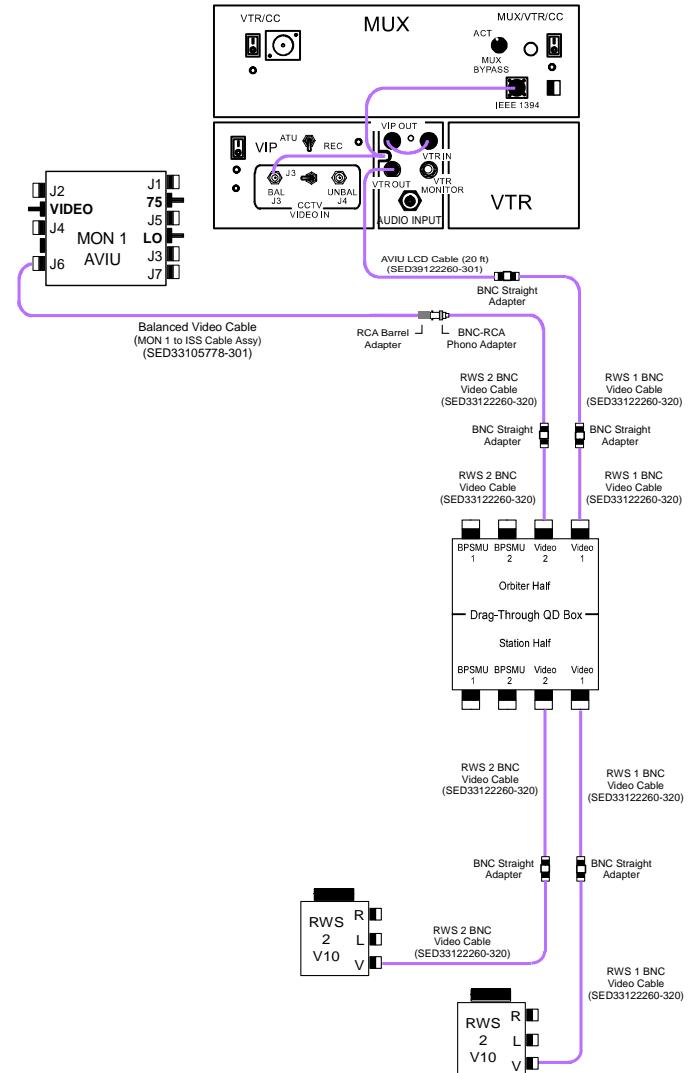
## SONY V10 (Continued)

### RWS VIDEO CABLE SETUP FOR S3/S4 INSTALL

1. Config H/W per dwg at right
2. ✓MON 1 to ISS Cable Assy connected to MON 1 AVIU J6



- Middeck
3. Drag-thru RWS 1,2 Cable Assys to RWS located in ISS Lab
  4. ✓Pwr configured per P/TV121 DOCKED OPERATIONS, dwg USOS 120VDC – V10 VTRs (SODF: PHOTO/TV: SCENES)
- V10
5. PWR (two) – ON



jsc48037\_117\_014r1.crx

## **SONY V10 (Continued)**

### **SPECIFICATIONS**

TAPE: Mini DVCAM Cassette

TAPE LENGTH: 40 min

CD: Color, 5.5 in

AUDIO: 16 bit at 48 KHz

PWR: 7.2V Batt

8.4V DC IN

BATT LIFETIME: ~60 min w/LCD closed

~30 min w/LCD open

BODY WEIGHT: 2.00 lb

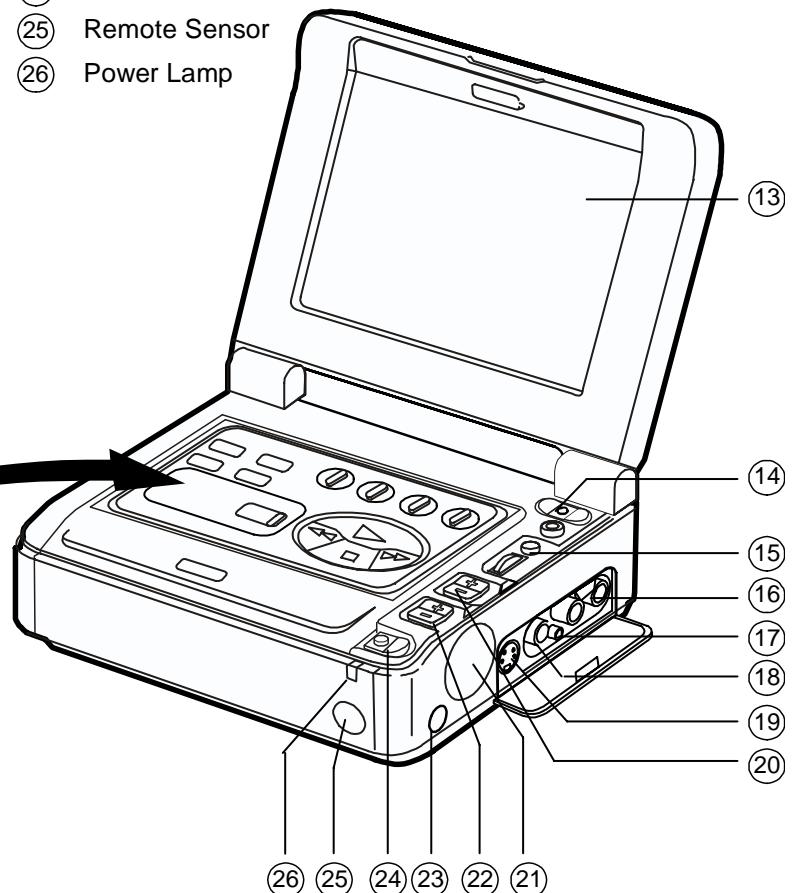
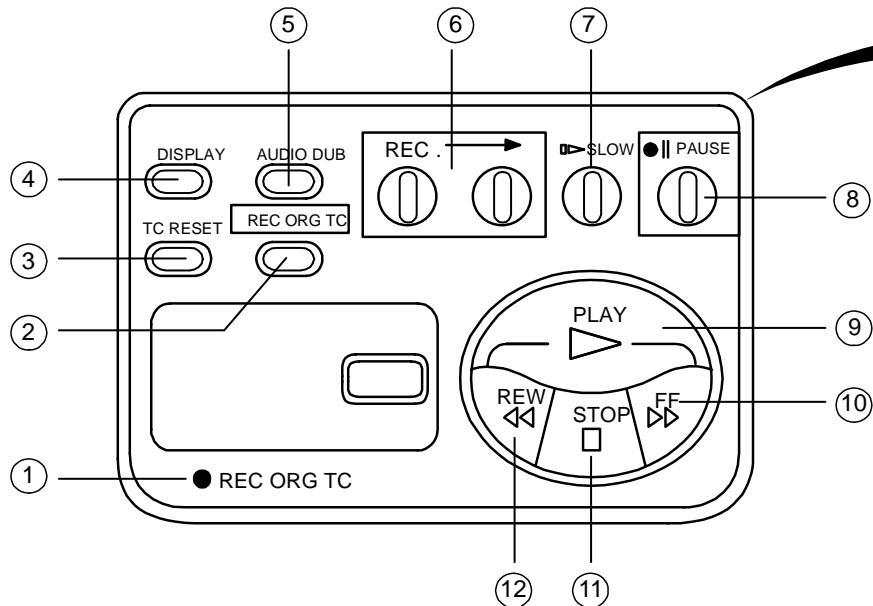
BATT WEIGHT: 0.41 lb

## SONY V10 (Continued)

### NOMENCLATURE

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| (1) REC ORG TC Lamp             | (12) REW (rewind) pb                |
| (2) REC ORG TC pb               | (13) LCD Screen                     |
| (3) TC Reset pb                 | (14) POWER sw                       |
| (4) DISPLAY pb                  | (15) MENU pb, Control dial          |
| (5) AUDIO DUB pb                | (16) AUDIO Input/Output Jacks (R,L) |
| (6) REC (recording) pb and Lamp | (17) RFU DC OUT Jack                |
| (7) SLOW pb                     | (18) VIDEO Input/Output Jack        |
| (8) PAUSE pb                    | (19) S VIDEO Input/Output Jack      |
| (9) PLAY (playback) pb          | (20) LCD BRIGHT pb                  |
| (10) FF (fast Forward) pb       | (21) Speaker                        |
| (11) STOP pb                    | (22) Volume pb                      |

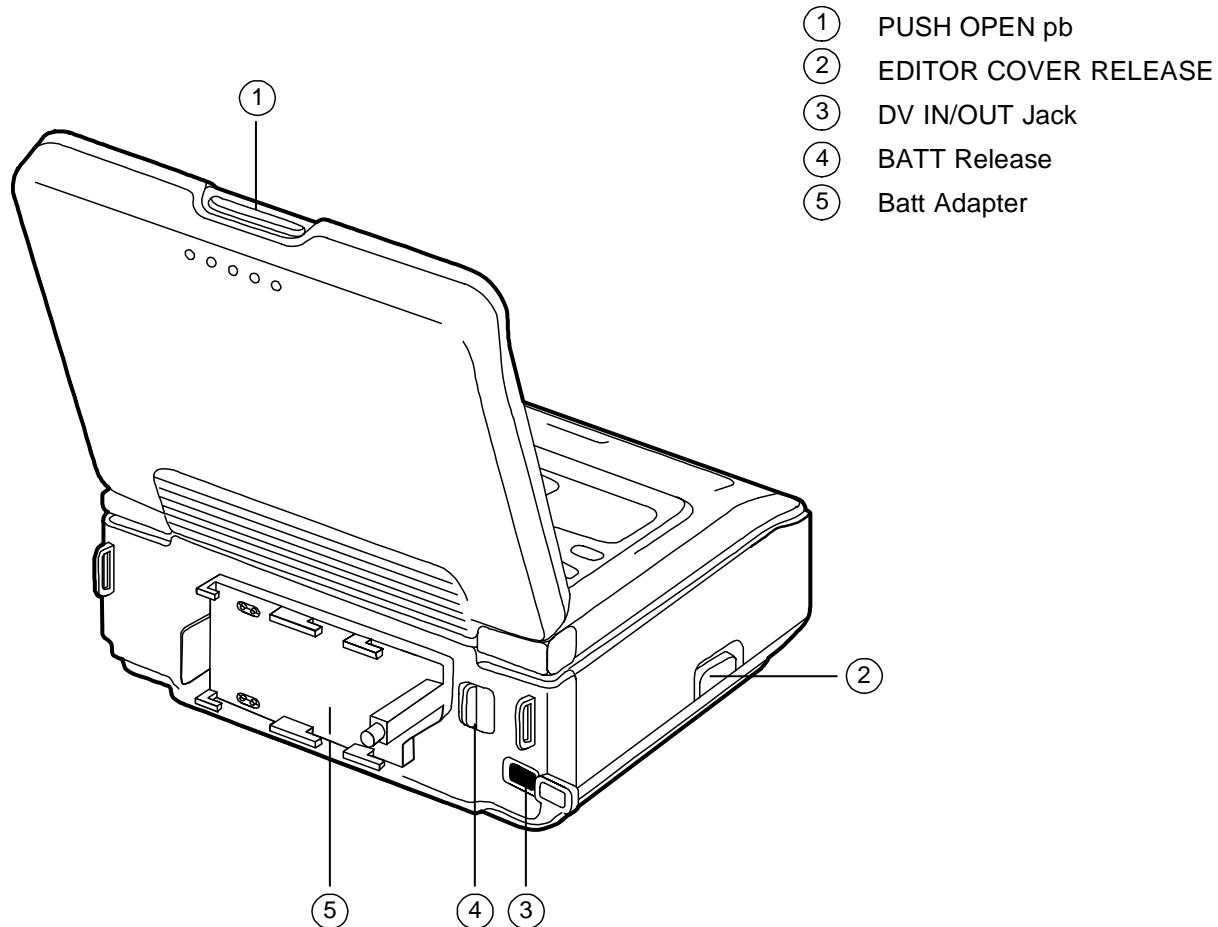
- |                     |
|---------------------|
| (23) Headphone Jack |
| (24) EJECT sw       |
| (25) Remote Sensor  |
| (26) Power Lamp     |



jsc48037\_037.cnv

## **SONY V10 (Continued)**

### **NOMENCLATURE (Concluded)**



jsc48037\_038.cnv

## **SONY V10 (Continued)**

### **MENU SETTINGS**

CMD – VTR4  
HiFi SOUND – STEREO  
AUDIO MODE – FS48K  
TIME CODE – DF  
BEEP – ON  
AUDIO MIX – “left” (ST1)  
CM SEARCH – ON  
DATA CODE – DATE/CAM  
LCD COLOR – “center”  
LCD HUE – “center”  
DISPLAY – LCD  
JOG AUDIO – OFF  
CLOCK SET – set to GMT

## SONY V10 (Concluded)

### V10 TO V10 VIA FIREWIRE

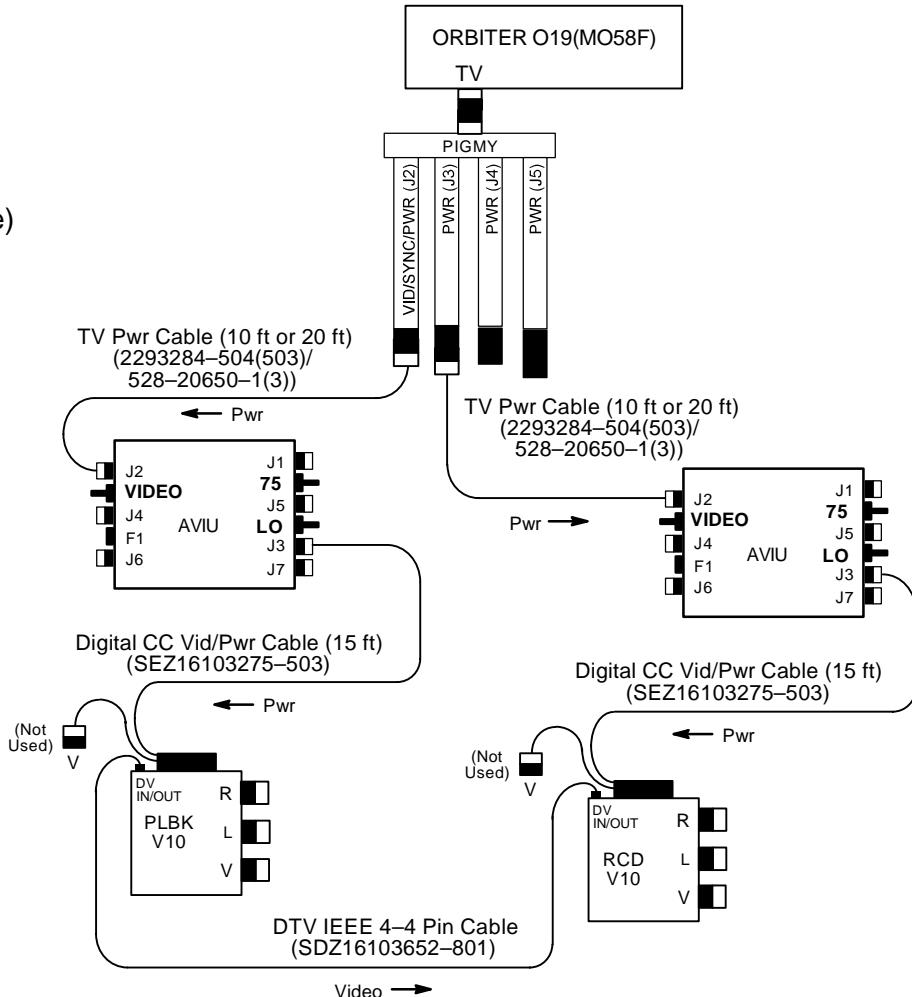
Config H/W per dwg at right

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

PLBK V10    PWR – ON  
DISPLAY pb – push  
Install source tape. Protect Tab – Slide (red visible)  
PLAY pb – push  
Cue tape to desired take  
PAUSE pb – push

RCD V10    PWR – ON  
DISPLAY pb – push  
Install new tape  
REC pb – push  
PAUSE pb – push

PLBK V10    Perform following for each video segment:  
RCD V10    PAUSE pb – push (To PLAY)  
PAUSE pb – push (To REC)  
When EDIT segment complete:  
PLBK V10    PAUSE pb – push (PAUSE)  
RCD V10    PAUSE pb – push (PAUSE)



jsc48037\_039r1.cvx

## PORTABLE MONITORS

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# PORTABLE MONITORS

## PORTABLE MONITORS

### PGSC VIDEO OVERLAY

- PGSC
1. ✓PGSC Pwr – ON
  2. Connect VID IN/OUT Cable to PGSC VID IN port  
(i.e., port w/Camr symbol next to Pwr port)
  3. Connect appropriate hardware from video source to VID IN/OUT Cable depending on desired video source per table below

Video Source	Hardware (part #)	From	To	Cable Connections
PAYLOAD/DTV	•AVIU-CC Video Cable (15ft) (SED39122269-301)	•L10A1 VTR OUT	•Vid In/Out缆	•BNC - RCA
Monitor 1(2) (option 1)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU Video Cable Assy (SEZ33114239-301)	•Mon/J3 ----- •AVIU/J5	•AVIU/J4 ----- •Vid In/Out缆	•Circ - Twinax ----- •Unique - RCA
Monitor 1(2) (option 2)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •Balanced Video Cable (SED33105778-301) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •AVIU/J6 •Balanced Video缆 •Bal/Unbal Xfmr	•AVIU/J4 ----- •Bal/Unbal xfmr •AVIU-CC Video缆 •Vid In/Out缆	•Circ - Twinax ----- •Twinax - Twinax ----- •BNC - RCA
Monitor 1(2) (option 3)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •AVIU/J7	•AVIU/J4 ----- •Vid In/Out缆	•Circ - Twinax ----- •BNC - RCA
Monitor 1(2) (option 4)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •Bal/Unbal Xfmr	•Bal/Unbal Xfmr ----- •Vid In/Out缆	•Circ - Twinax ----- •BNC - RCA

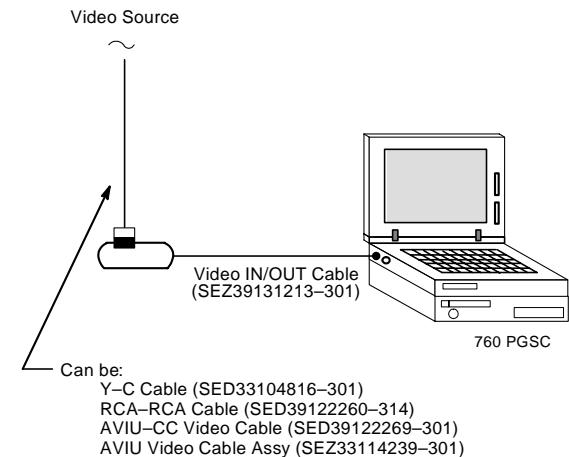
## PORABLE MONITORS (Continued)

### PGSC VIDEO OVERLAY (Concluded)

Video Source	Hardware (part #)	From	To	Cable Connections
ISS	<ul style="list-style-type: none"> <li>•VPU Patch Cable (SED39136025-301)</li> <li>•Bal/Unbal Xfmr (SED39124190-301)</li> <li>•AVIU-CC Video Cable (15ft) (SED39122269-301)</li> </ul>	<ul style="list-style-type: none"> <li>•VPU FROM ISS</li> <li>-----</li> <li>•Bal/Unbal Xfmr</li> </ul>	<ul style="list-style-type: none"> <li>•Bal/Unbal Xfmr</li> <li>-----</li> <li>•Vid In/Out缆</li> </ul>	<ul style="list-style-type: none"> <li>•Plug - Twinax</li> <li>-----</li> <li>•BNC - RCA</li> </ul>
Spare 1 (SSV)	<ul style="list-style-type: none"> <li>•SSV to PDIP/CIP Cable (SED16103246-301)</li> <li>•Bal/Unbal Xfmr (SED39124190-301)</li> <li>•AVIU-CC Video Cable (15ft) (SED39122269-301)</li> </ul>	<ul style="list-style-type: none"> <li>•L11A2 PDIP/J107</li> <li>-----</li> <li>•Bal/Unbal Xfmr</li> </ul>	<ul style="list-style-type: none"> <li>•Bal/Unbal Xfmr</li> <li>-----</li> <li>•Vid In/Out缆</li> </ul>	<ul style="list-style-type: none"> <li>•Circ - Twinax</li> <li>-----</li> <li>•BNC - RCA</li> </ul>
WVS	•AVIU-CC Video Cable (15ft) (SED39122269-301)	•R12A2 WIB XCVR1(2) UNBAL	•Vid In/Out缆	•BNC - RCA
PD100 Camc (option 1)	<ul style="list-style-type: none"> <li>•PD100 A/V Adapter Cable (SEZ16103275-301)</li> <li>•RCA - RCA Cable (SED39122260-314)</li> </ul>	<ul style="list-style-type: none"> <li>•PD100 A/V port</li> <li>•A/V adapter</li> </ul>	<ul style="list-style-type: none"> <li>•RCA-RCA缆 (via female adapter)</li> <li>•Vid In/Out缆</li> </ul>	<ul style="list-style-type: none"> <li>•Stereo - RCA</li> <li>•RCA - RCA</li> </ul>
PD100 Camc (option 2)	•Y-C Cable (SED33104816-301)	•PD100 S-Video port	•Vid In/Out缆	•S-Video - S-Video

4. Configure video source
5. Double-click Shuttle Apps > Video Overlay
6. ✓Video overlay displayed

- \* If image not displayed on PGSC: \*
- \* Press 'S' \*
- \* ✓'VIDEO' selected \*
- \* Sel OK \*



## PORTABLE MONITORS (Continued)

### A31p VIDEO CONVERTER

A31p      1. √A31p Pwr – ON

2. Connect A31p Video Adapter to A31p VID IN “→S“
3. Connect appropriate hardware from video source to A31p Video Adapter Cable depending on desired video source per table below

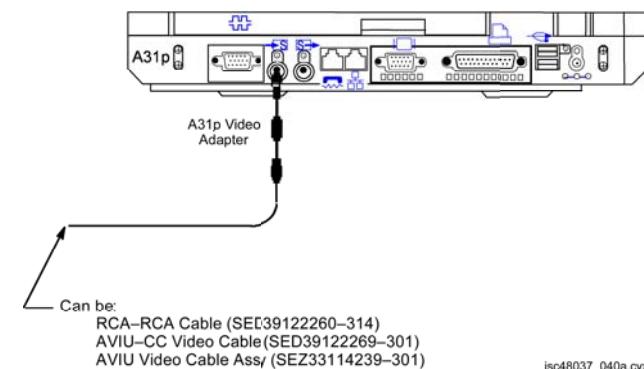
Video Source	Hardware (part #)	From	To	Cable Connections
PAYLOAD/DTV	•AVIU-CC Video Cable (15ft) (SED39122269-301)	•L10A1 VTR OUT	•A31p Video Adapter	•BNC - RCA
Monitor 1(2) (option 1)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU Video Cable Assy (SEZ33114239-301)	•Mon/J3 ----- •AVIU/J5	•AVIU/J4 ----- • A31p Video Adapter	•Circ - Twinax ----- •Unique - RCA
Monitor 1(2) (option 2)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •Balanced Video Cable (SED33105778-301) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •AVIU/J6 •Balanced Video cbl •Bal/Unbal Xfmr	•AVIU/J4 ----- •Bal/Unbal xfmr •AVIU-CC Video cbl • A31p Video Adapter	•Circ - Twinax ----- •Twinax - Twinax ----- •BNC - RCA
Monitor 1(2) (option 3)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •AVIU/J7	•AVIU/J4 ----- • A31p Video Adapter	•Circ - Twinax ----- •BNC - RCA
Monitor 1(2) (option 4)	•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)	•Mon/J3 ----- •Bal/Unbal Xfmr	•Bal/Unbal Xfmr ----- • A31p Video Adapter	•Circ - Twinax ----- •BNC - RCA

## PORABLE MONITORS (Continued)

### A31p VIDEO CONVERTER (Concluded)

Video Source	Hardware (part #)	From	To	Cable Connections
ISS	<ul style="list-style-type: none"> <li>•VPU Patch Cable (SED39136025-301)</li> <li>•Bal/Unbal Xfmr (SED39124190-301)</li> <li>•AVIU-CC Video Cable (15ft) (SED39122269-301)</li> </ul>	<ul style="list-style-type: none"> <li>•VPU FROM ISS</li> <li>-----</li> <li>•Bal/Unbal Xfmr</li> </ul>	<ul style="list-style-type: none"> <li>•Bal/Unbal Xfmr</li> <li>-----</li> <li>•A31p Video Adapter</li> </ul>	<ul style="list-style-type: none"> <li>•Plug - Twinax</li> <li>-----</li> <li>•BNC - RCA</li> </ul>
Spare 1 (SSV)	<ul style="list-style-type: none"> <li>•SSV to PDIP/CIP Cable (SED16103246-301)</li> <li>•Bal/Unbal Xfmr (SED39124190-301)</li> <li>•AVIU-CC Video Cable (15ft) (SED39122269-301)</li> </ul>	<ul style="list-style-type: none"> <li>•L11A2 PDIP/J107</li> <li>-----</li> <li>•Bal/Unbal Xfmr</li> </ul>	<ul style="list-style-type: none"> <li>•Bal/Unbal Xfmr</li> <li>-----</li> <li>•A31p Video Adapter</li> </ul>	<ul style="list-style-type: none"> <li>•Circ - Twinax</li> <li>-----</li> <li>•BNC - RCA</li> </ul>
WVS	•AVIU-CC Video Cable (15ft) (SED39122269-301)	•R12A2 WIB XCVR1(2) UNBAL	•A31p Video Adapter	•BNC - RCA
PD100 Camc (option 1)	<ul style="list-style-type: none"> <li>•PD100 A/V Adapter Cable (SEZ16103275-301)</li> <li>•RCA - RCA Cable (SED39122260-314)</li> </ul>	<ul style="list-style-type: none"> <li>•PD100 A/V port</li> <li>•A/V adapter</li> </ul>	<ul style="list-style-type: none"> <li>•RCA-RCA cbl (via female adapter)</li> <li>•A31p Video Adapter</li> </ul>	<ul style="list-style-type: none"> <li>•Stereo - RCA</li> <li>•RCA - RCA</li> </ul>
PD100 Camc (option 2)	•Y-C Cable (SED33104816-301)	•PD100 S-Video port	•A31p Video In port (No A31p Video Adapter)	•S-Video - S-Video

4. Configure H/W per dwg at right
5. Double-click Shuttle Apps > Video Overlay
6. ✓'Video Converter' window displayed
7. Sel 'Local Full Screen'  
Press 'ESC' or 'W' key to minimize display as reqd

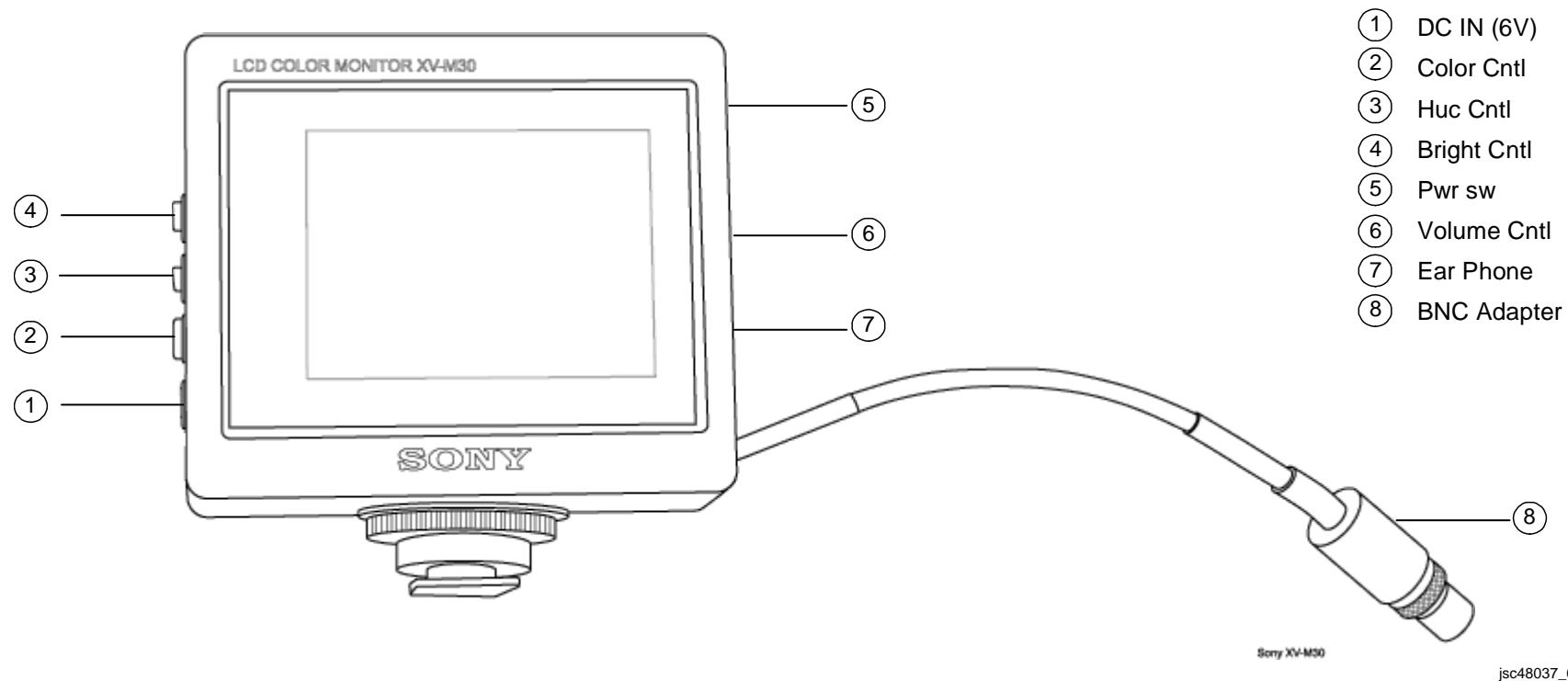


## PORABLE MONITORS (Continued)

### SONY LCD SPECIFICATIONS

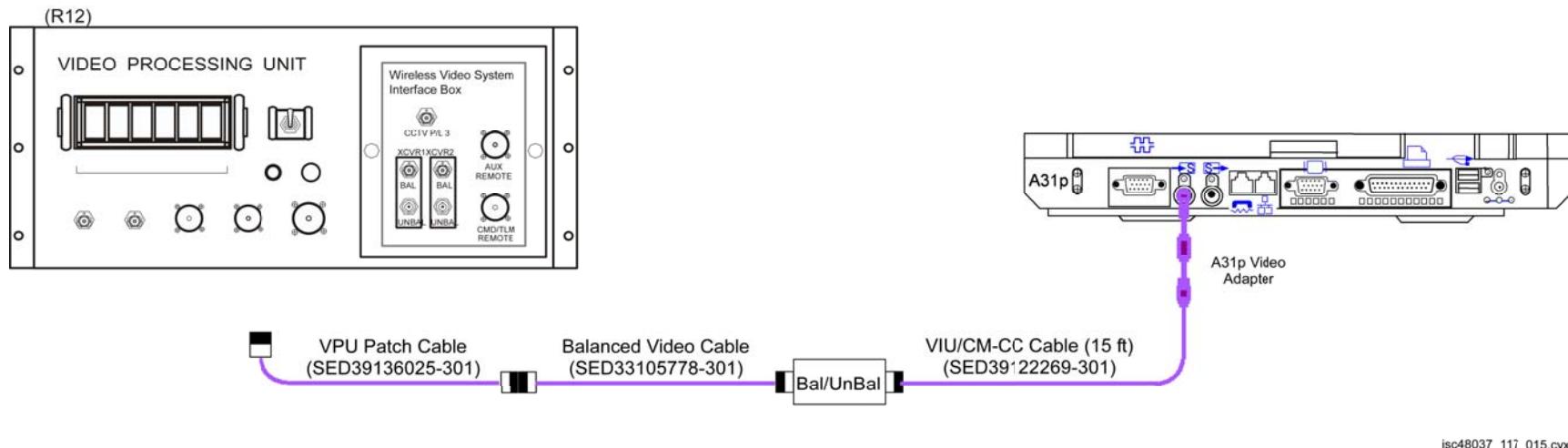
IMAGE AREA: 3 in  
BATT: 6 AA  
BATT VOLTAGE: 9V  
DIMENSIONS: 1.5 in (L) X 4 in (W) X 3.25 in (H)

### SONY LCD NOMENCLATURE



## PORABLE MONITORS (Concluded)

### VPU REPEATER



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## CCTV

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## CCTV

### CCTV

#### SPECIFICATIONS

##### CTVC (SOLID STATE)

EFFECTIVE IMAGE SIZE: 6.54mm X 8.62mm  
PWR: 43.3W at 32V (all motors on)  
ZOOM SPEED: End-to-End 8 sec  
FOCUS SPEED: End-to-End 22 sec  
IRIS: Auto(Manual) Close ~7 sec  
WEIGHT: 18.9 lb  
DIMENSION: 17" (L) x 6.4" (W) x 6.3" (H)

##### ITVC

EFFECTIVE IMAGE SIZE: 6.54mm X 8.62mm  
PWR: 33.6W at 32V  
ZOOM SPEED: End-to-End 8 sec  
FOCUS SPEED: End-to-End 22 sec  
IRIS: Auto close ~6 sec  
WEIGHT: 17 lb  
DIMENSION: 19.6" (L) (Includes 3.2" Lens) x 6.4" (W) x 6.3" (H)

## CCTV (Continued)

### LENS DATA

Lens/Focal Length		Aperture Range	Zoom Ratio	Minimum Focus Distance (ft)	Approximate Field of View (FOV)	
					Horizontal	Vertical
CTVC (COLOR)*	5.5mm-47mm	f/1.7 to f/16 (T2-T360)	8:1	1.0	75°-10°	61°-8°
ITVC (B/W)*	8.5mm-127mm	f/1.7 to f/16 (T2-T360)	15:1	3.0	53°-4°	41°-3°

### ILLUMINATOR DATA

Color	LEDs	LED Deg Angles	Camr Type	Locations	Modes	Control
Red	120	8°/22°/8° *	ITVC	Bulkhead, Elbow, Keel	ON/OFF	cb CAMR HTR
	120	22°	ITVC	Bulkhead, Elbow, Keel	ON/OFF	cb CAMR HTR
White	40	44°	CTVC	Wrist	ON/OFF	cb CAMR HTR
	180	20°	CTVC/ITVC	Bulkhead, Elbow, Keel	ON/OFF	cb PAN/TILT HTR
	156	29°	Videospection	Keel	156 LED/84 LED/30 LED/OFF	SSP/CAMR HTR sw

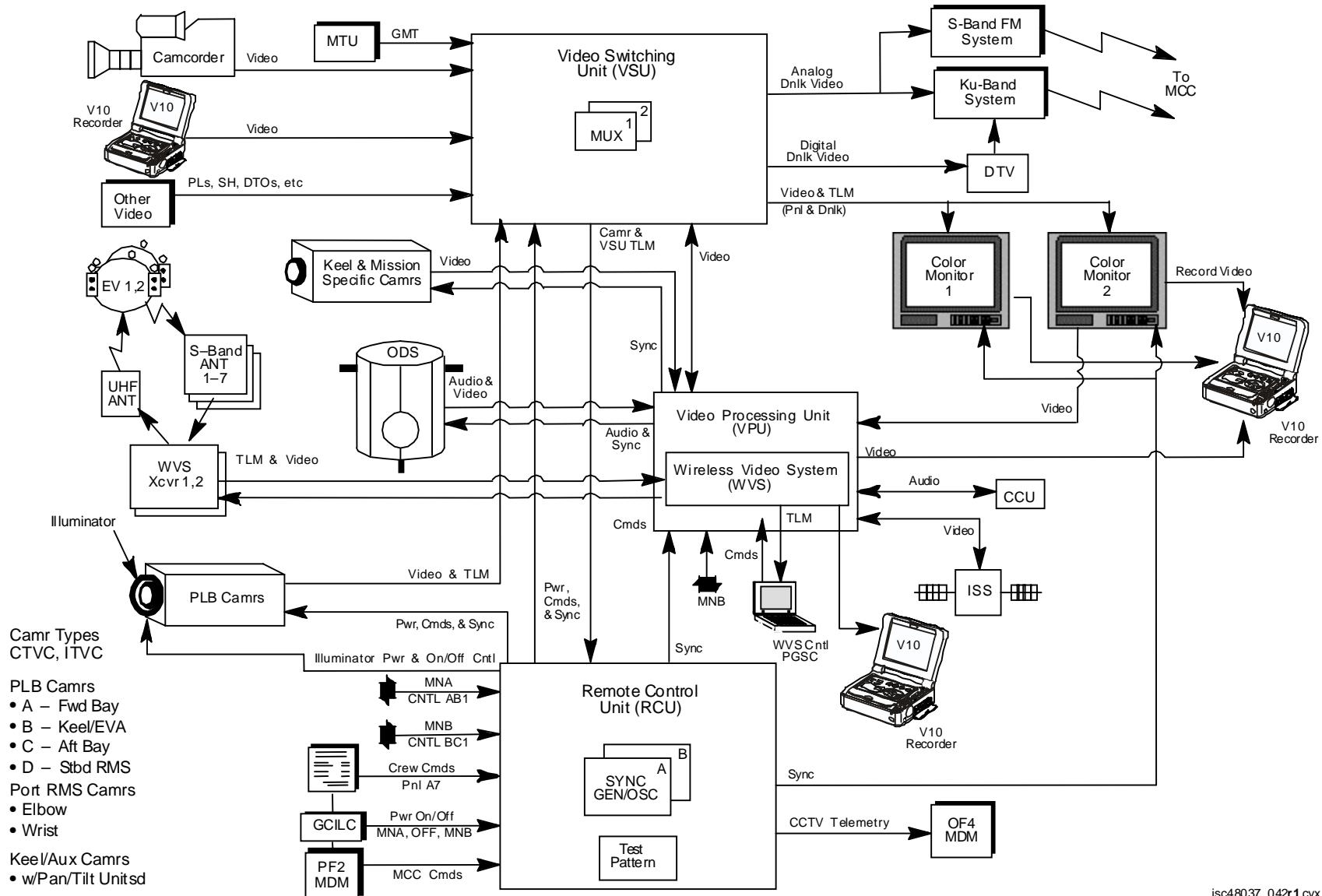
\*Three rings of LEDs:

Inner,outer rings – 8° LEDs

Middle ring – 22° LEDs

## CCTV (Continued)

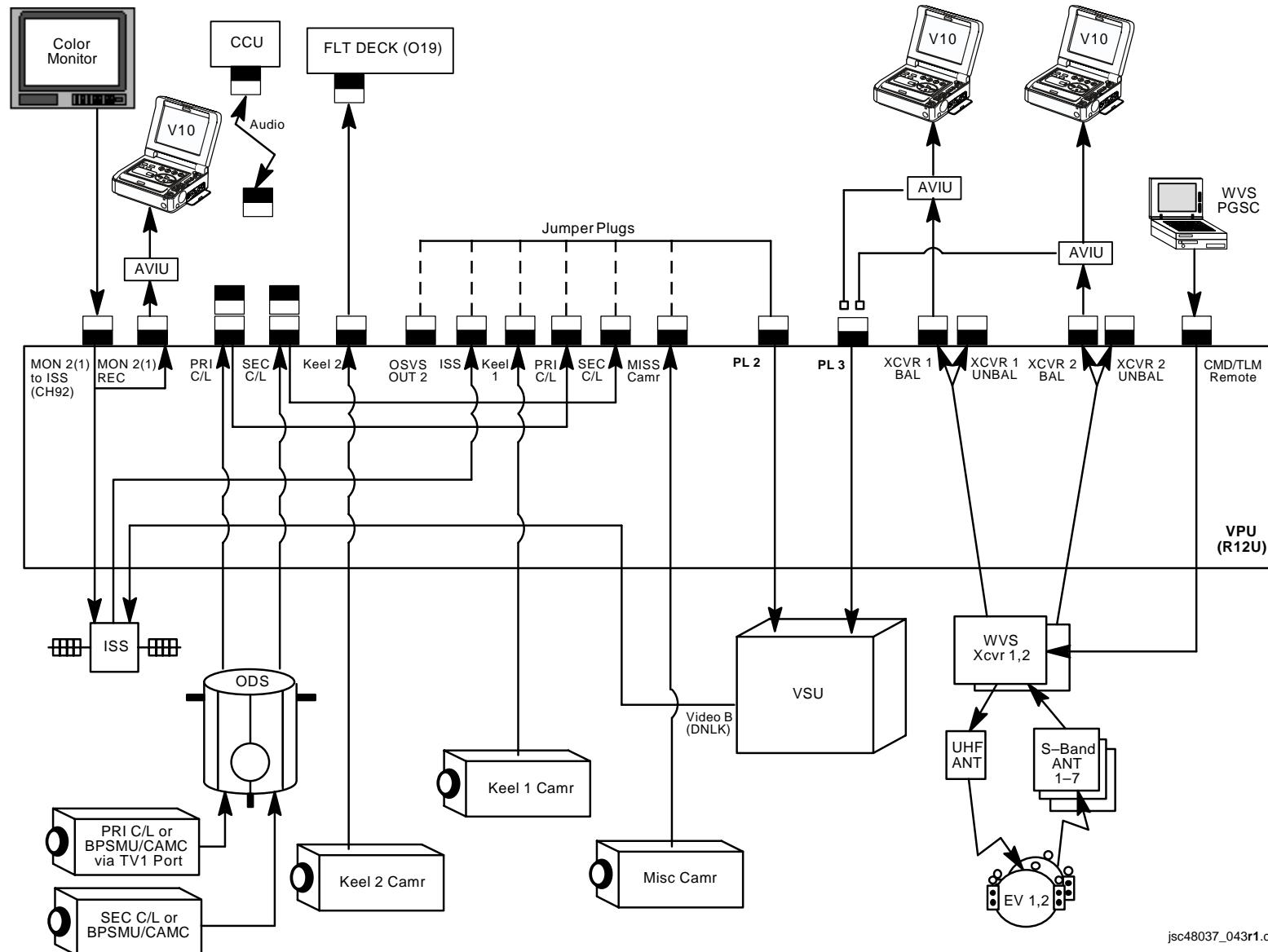
### CCTV SYSTEM OVERVIEW



jsc48037\_042r1.cvx

## CCTV (Continued)

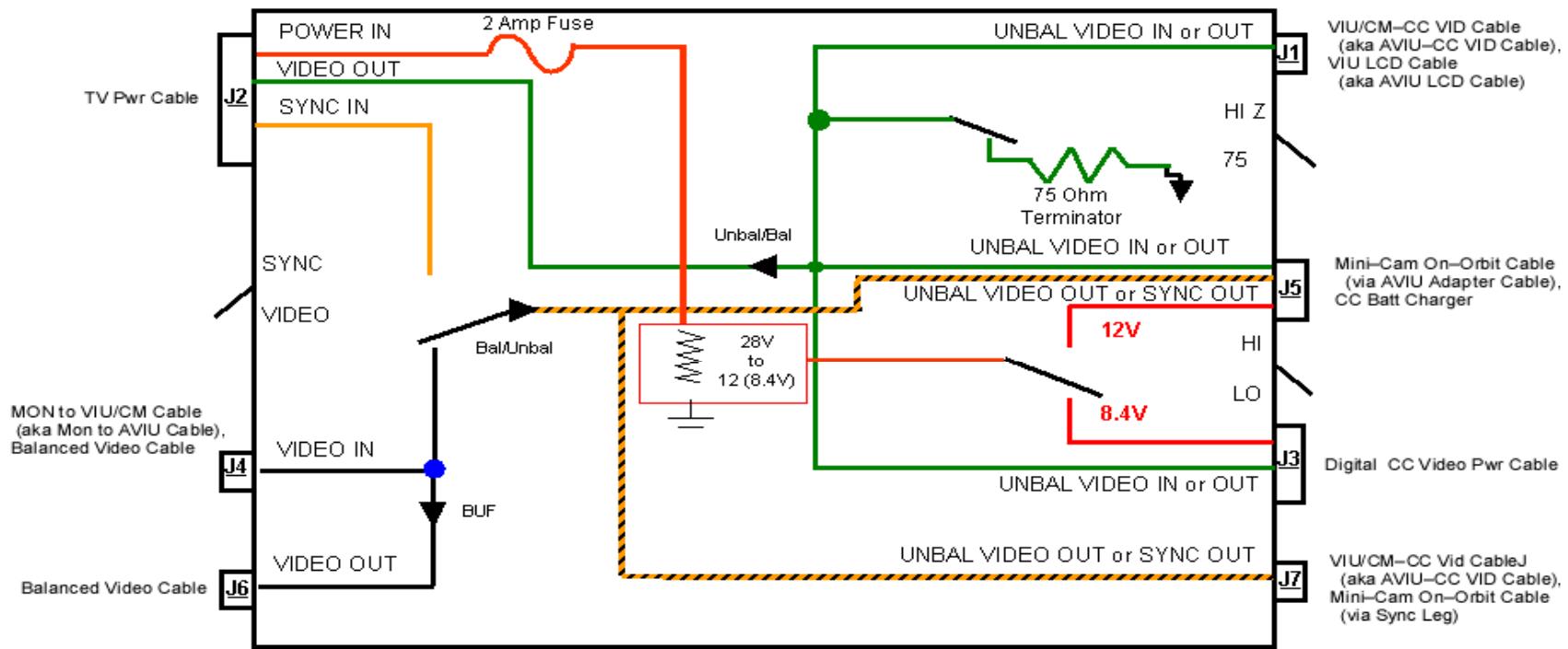
### VPU/WIB VIDEO ROUTING OVERVIEW



jsc48037\_043r1.csv

## CCTV (Continued)

### AVIU OVERVIEW



- J1**
- Unbalanced Video Input(Output)

- J2**
- 28V Input
  - Sync Input
  - Balanced Video Output

- J3**
- 8.4V Power Output if HI/LO sw – LO
  - Unbalanced Video Input(Output)

- J4**
- Balanced Video Input

- J5**
- 12V Power Output if HI/LO sw – HI
  - Unbalanced Video Input(Output)
  - Unbalanced Video Output (of J4 Balanced Input) if SYNC/VIDEO sw – VIDEO
  - Sync Output if SYNC/VIDEO sw – SYNC

- J6**
- Balanced Video Signal Output (turnaround from J4)

- J7**
- Unbalanced Video Output (of J4 Balanced Input) if SYNC/VIDEO sw – VIDEO
  - Sync Output if SYNC/VIDEO sw – SYNC

#### SYNC/VIDEO sw

- VIDEO – Unbalanced Video Output to J5,J7 from J4 Input
- SYNC – Sync Output to J5(J7) from J2 input

#### HI-Z/75 sw

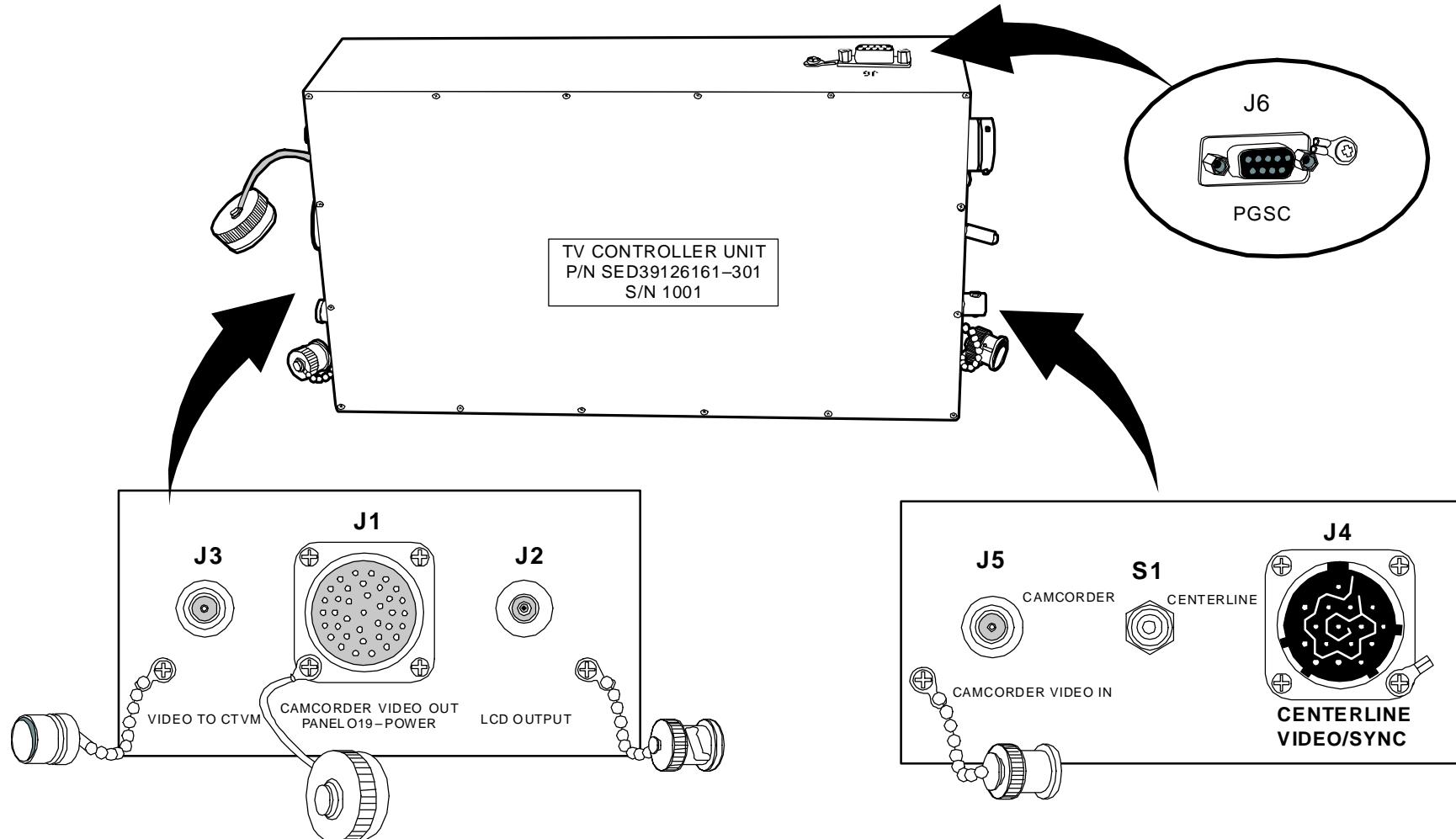
- 75 – For nominal video output at J1
- HI-Z – For video output at J1 to a terminal source (i.e., PGSC, PD100, or V10)

#### HI/LO sw

- HI – 12V output at J5
- LO – 8.4V output at J3

## CCTV (Continued)

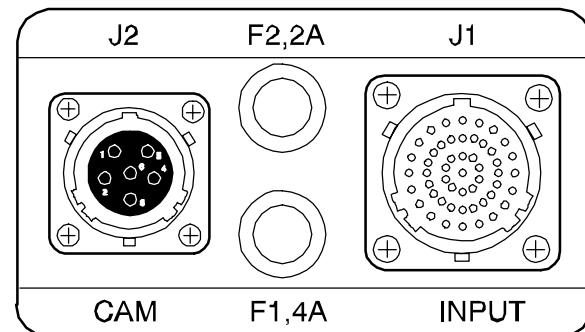
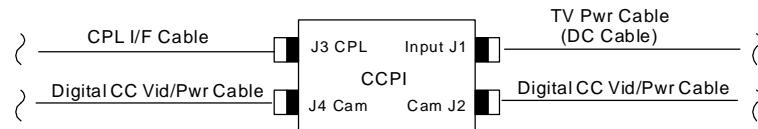
### TVCU



jsc48037\_045.cnv

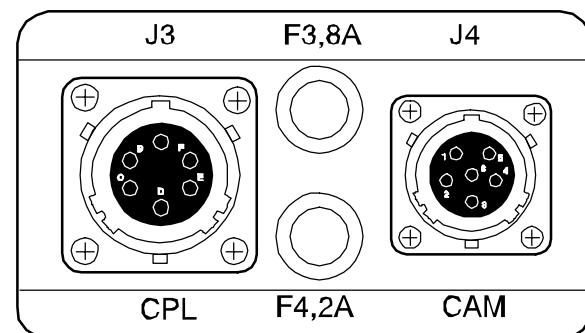
## CCTV (Continued)

### CAMCORDER/COMPACT PORTABLE LIGHT POWER INTERFACE (CCPI)



DECAL on CCPI

**OPERATING LIMITS**  
CAMCORDER ONLY – UNLIMITED  
CPL ONLY – 10 MIN.  
CPL + ONE CAMCORDER – 14 MIN.  
CPL + TWO CAMCORDERS – 11 MIN.



#### CONTENTS OF

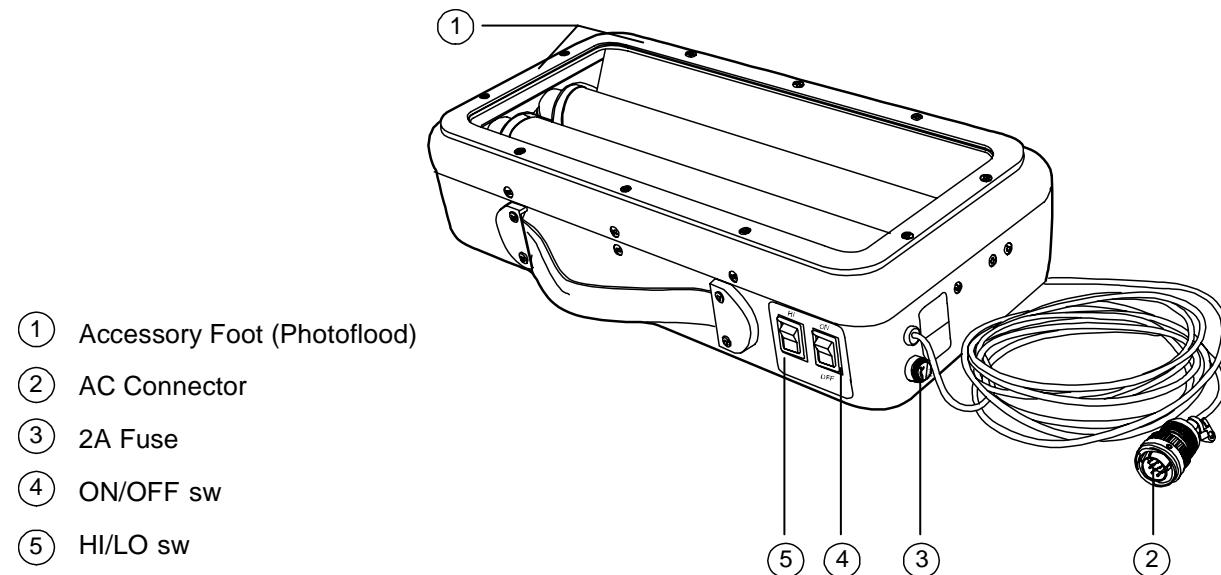
#### CCPI FUSE KIT (P/N SED33105384-301)

CCPI	
CPL OUT	8A
INPUT	4A
CC OUT	2A
VIU	
VIU-TEAC	2A
VIU/C/CM	1A

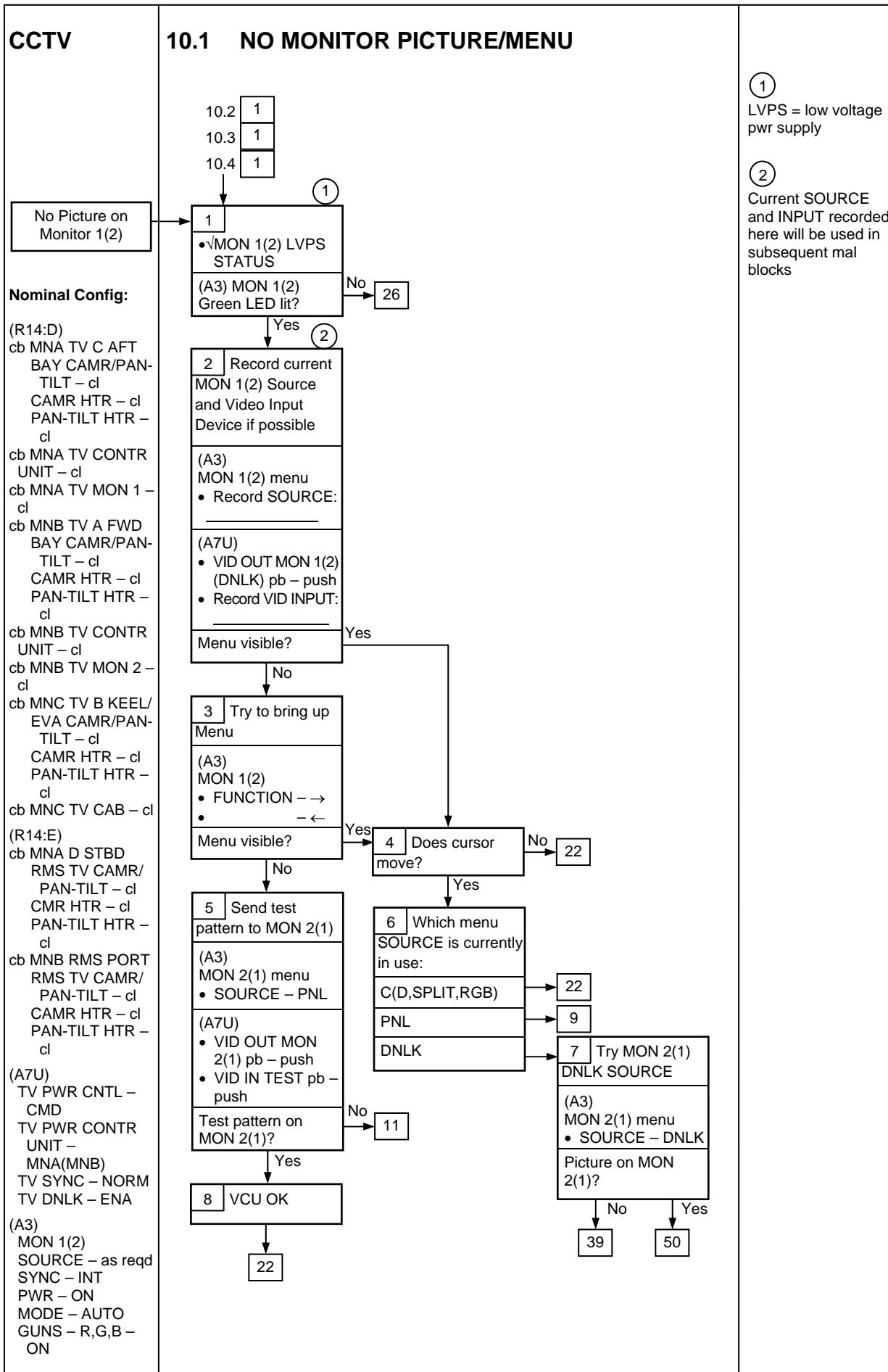
jsc48037\_046.cnv

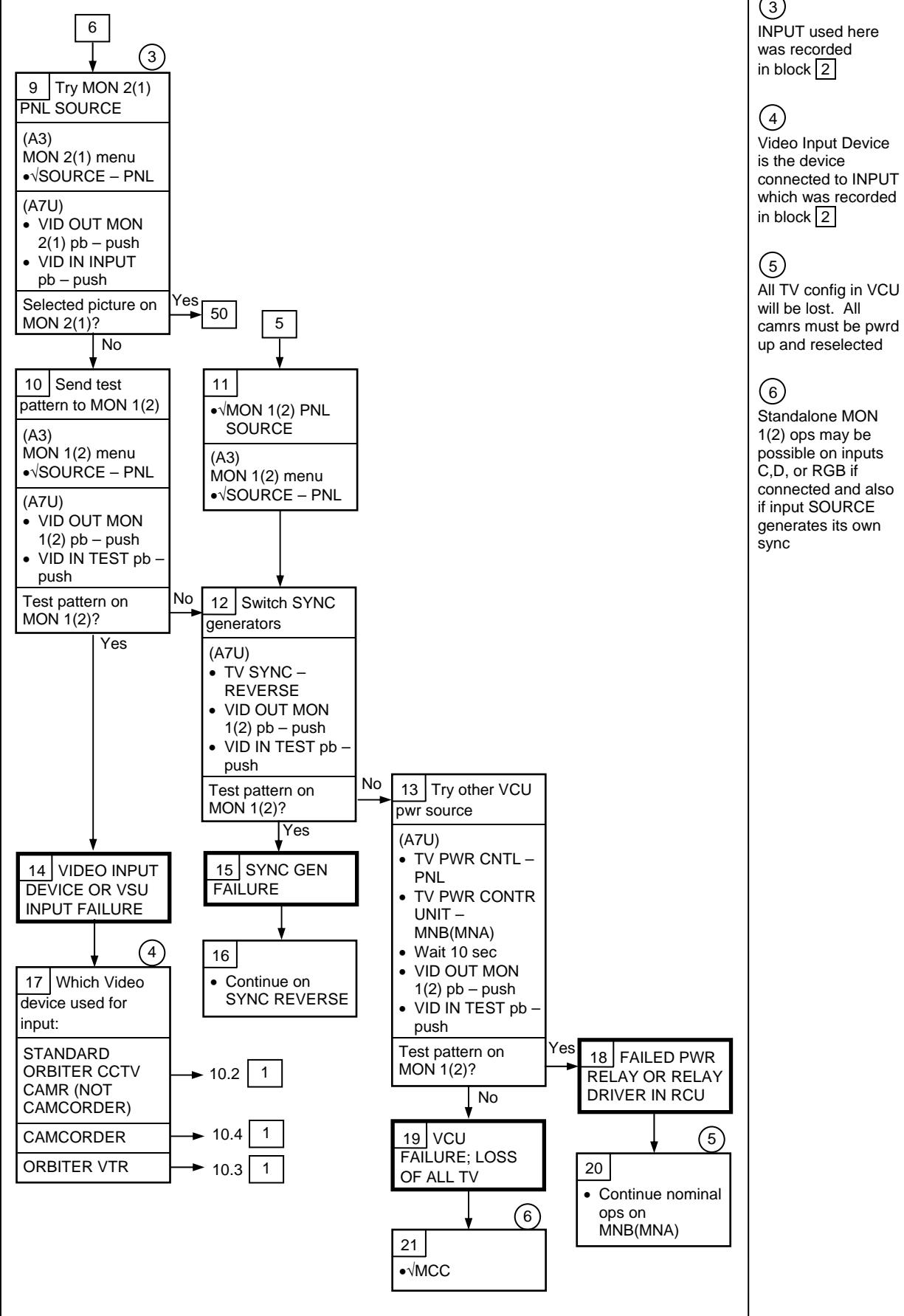
## CCTV (Continued)

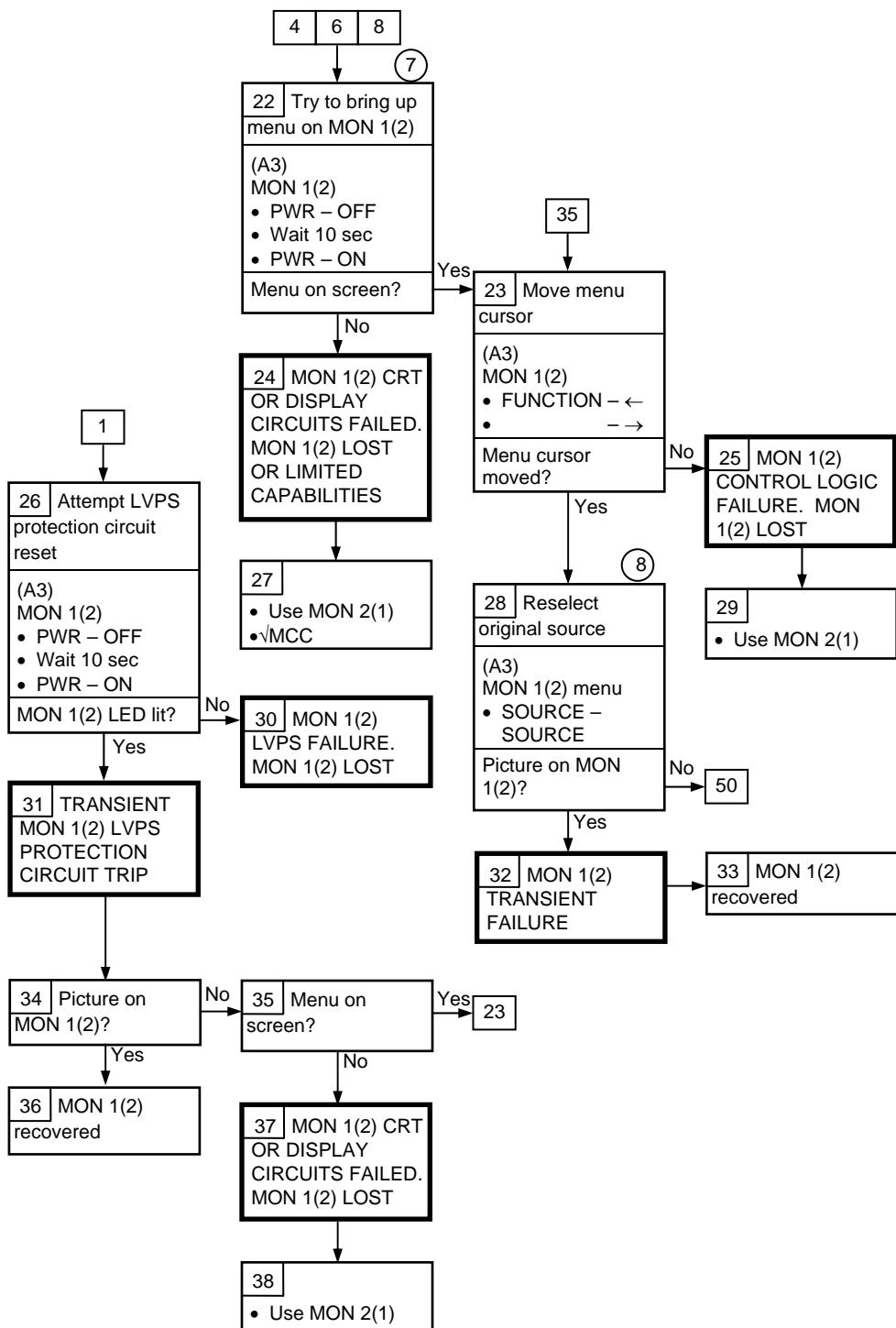
### PHOTO FLOODLIGHT



jsc48037\_047.cnv

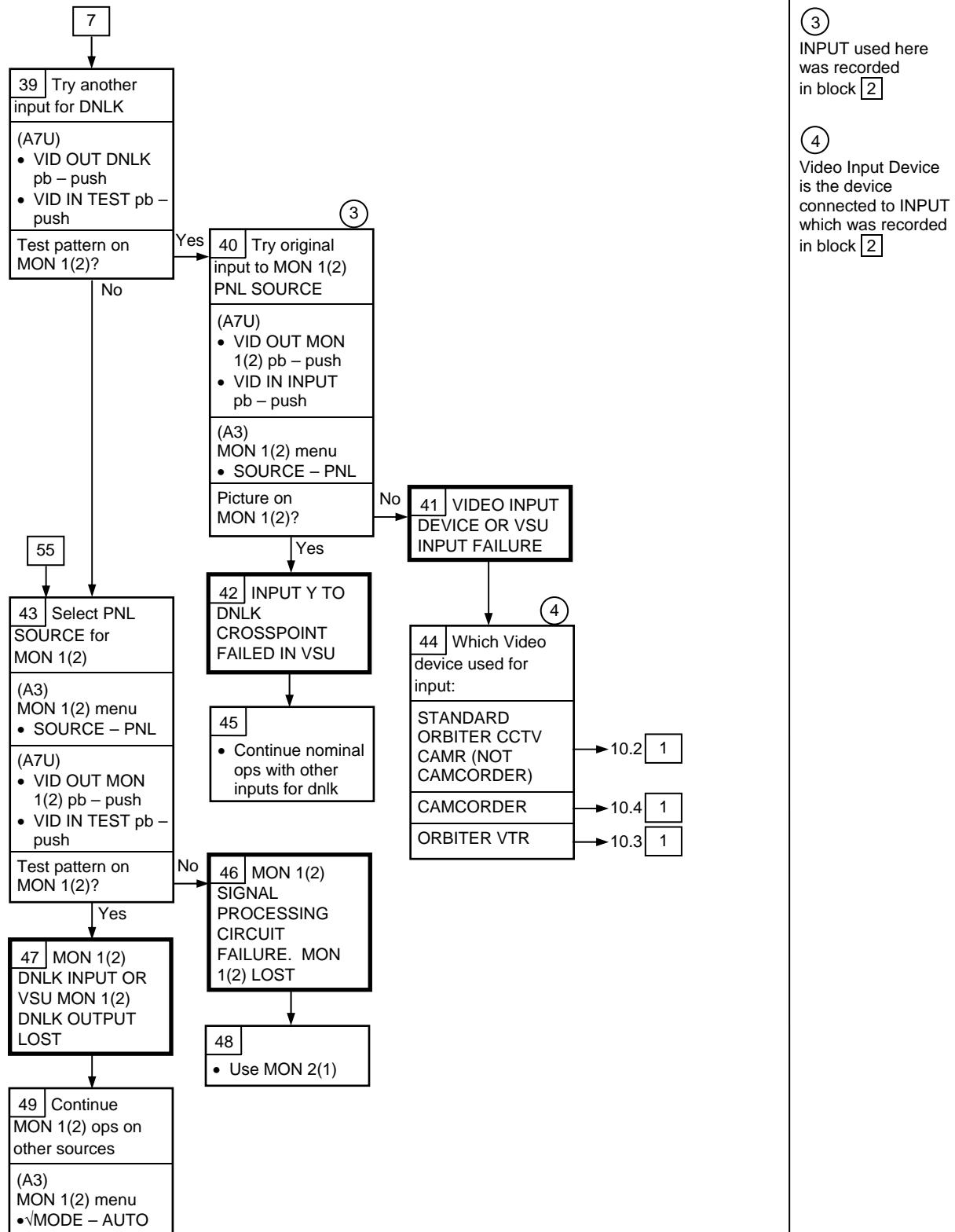


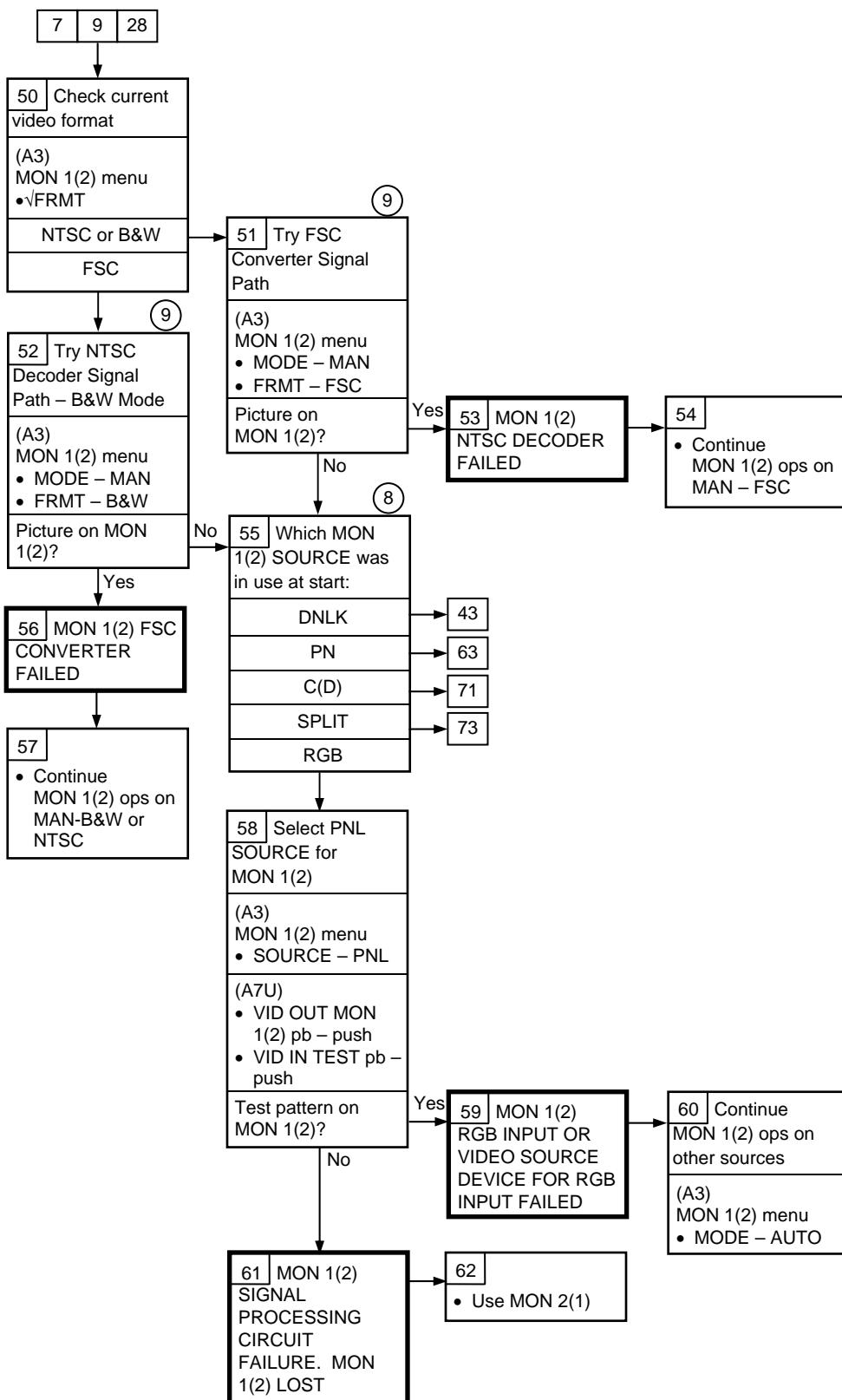




(7) Brightness and contrast controls may need to be adjusted to see menu

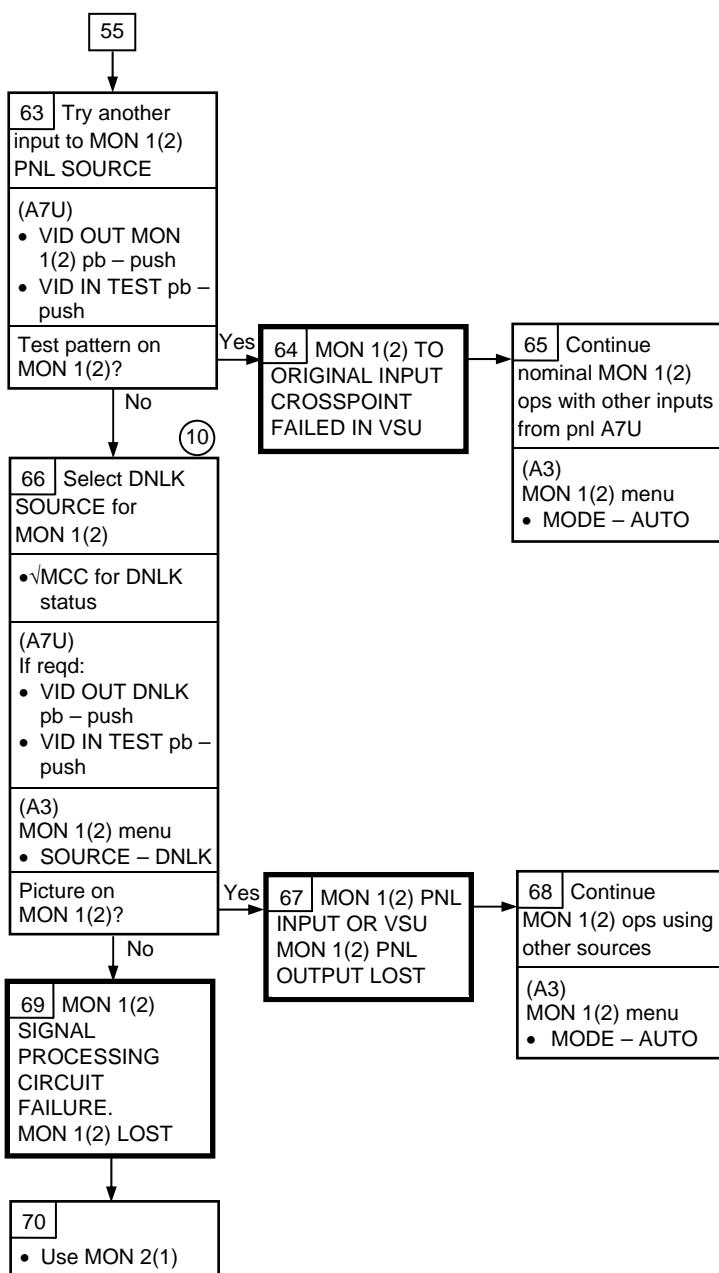
(8) SOURCE is the source recorded in block [2]





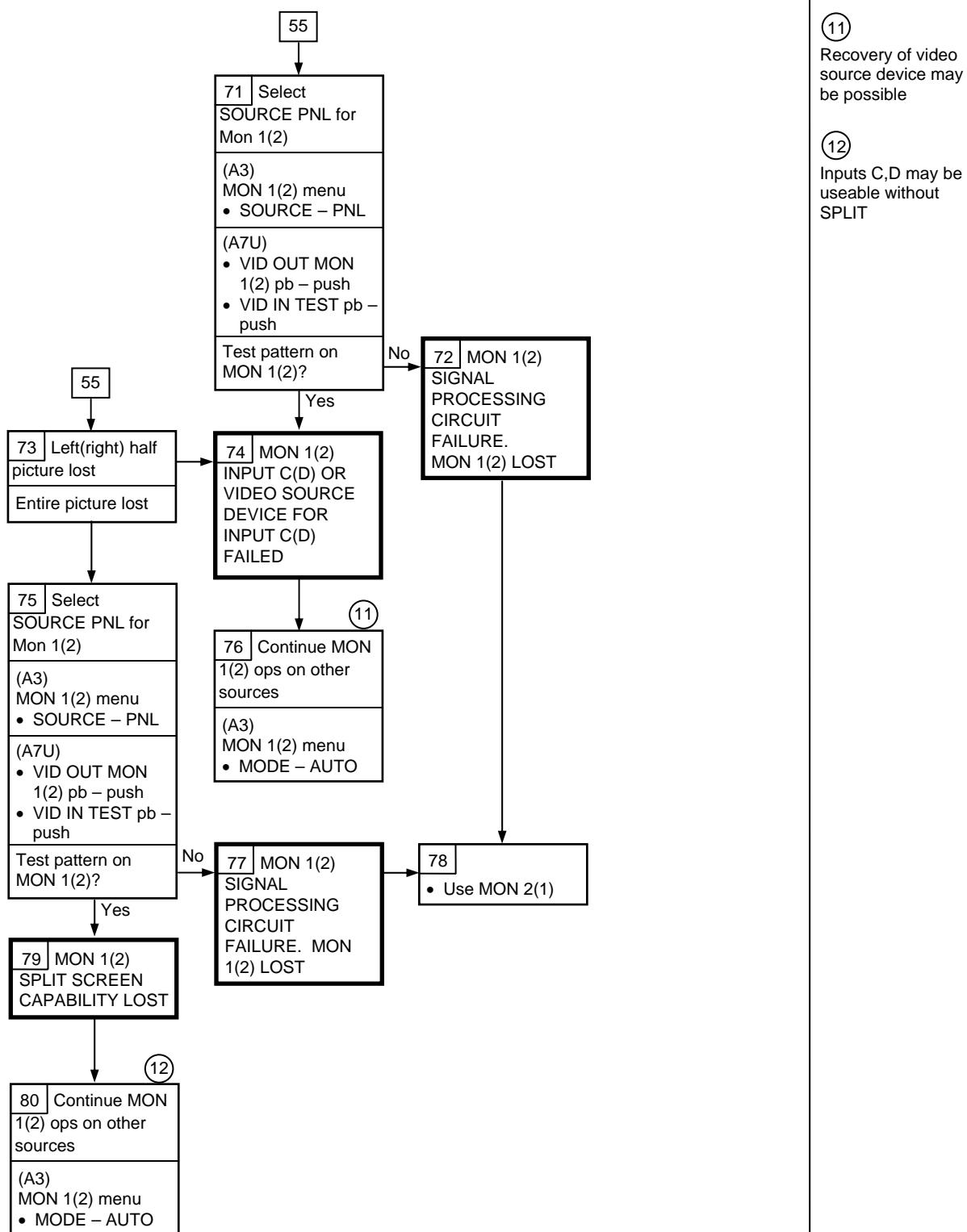
(8)  
SOURCE is the source recorded in block 2

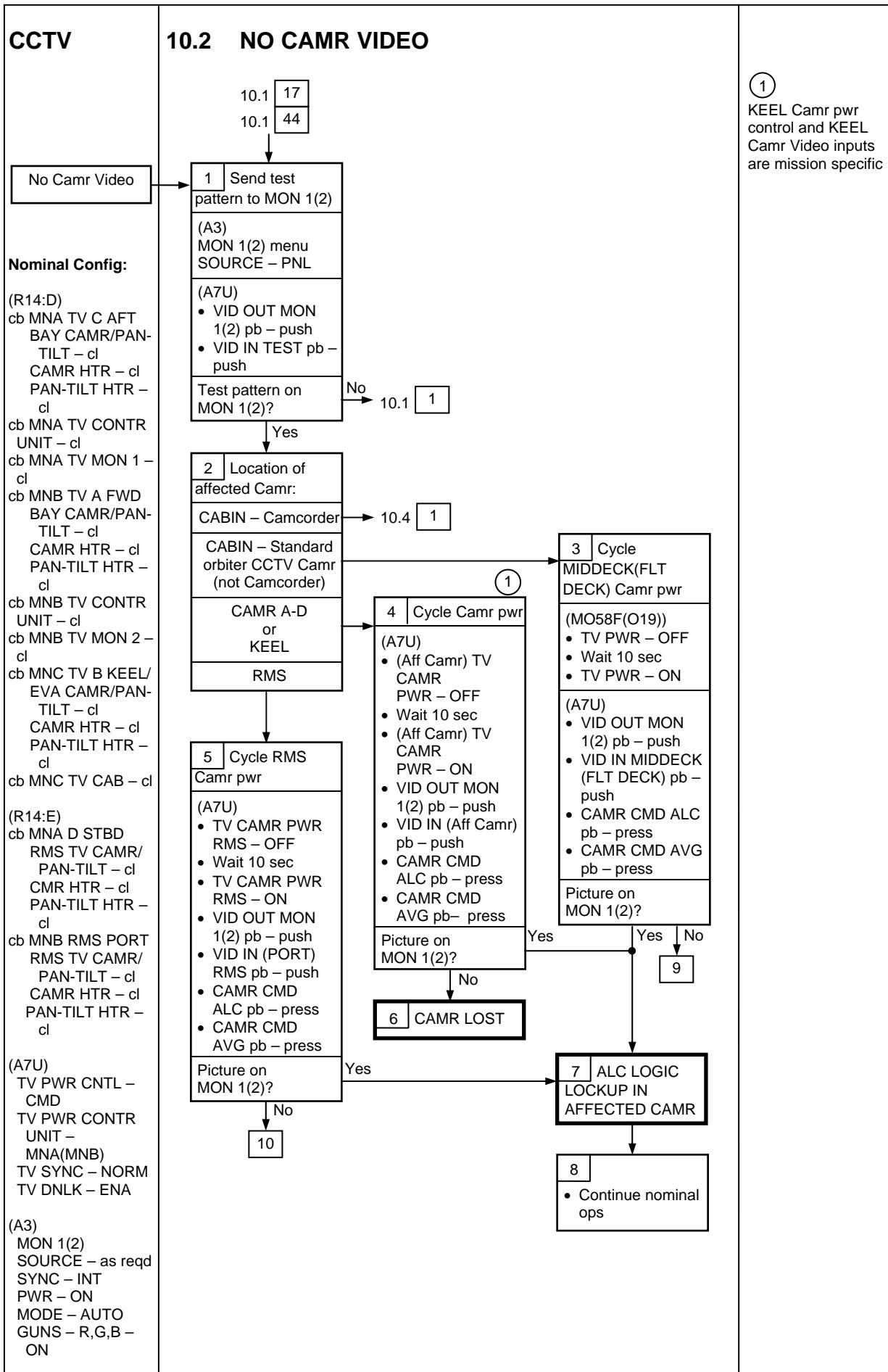
(9)  
Picture will be B&W with possible flicker

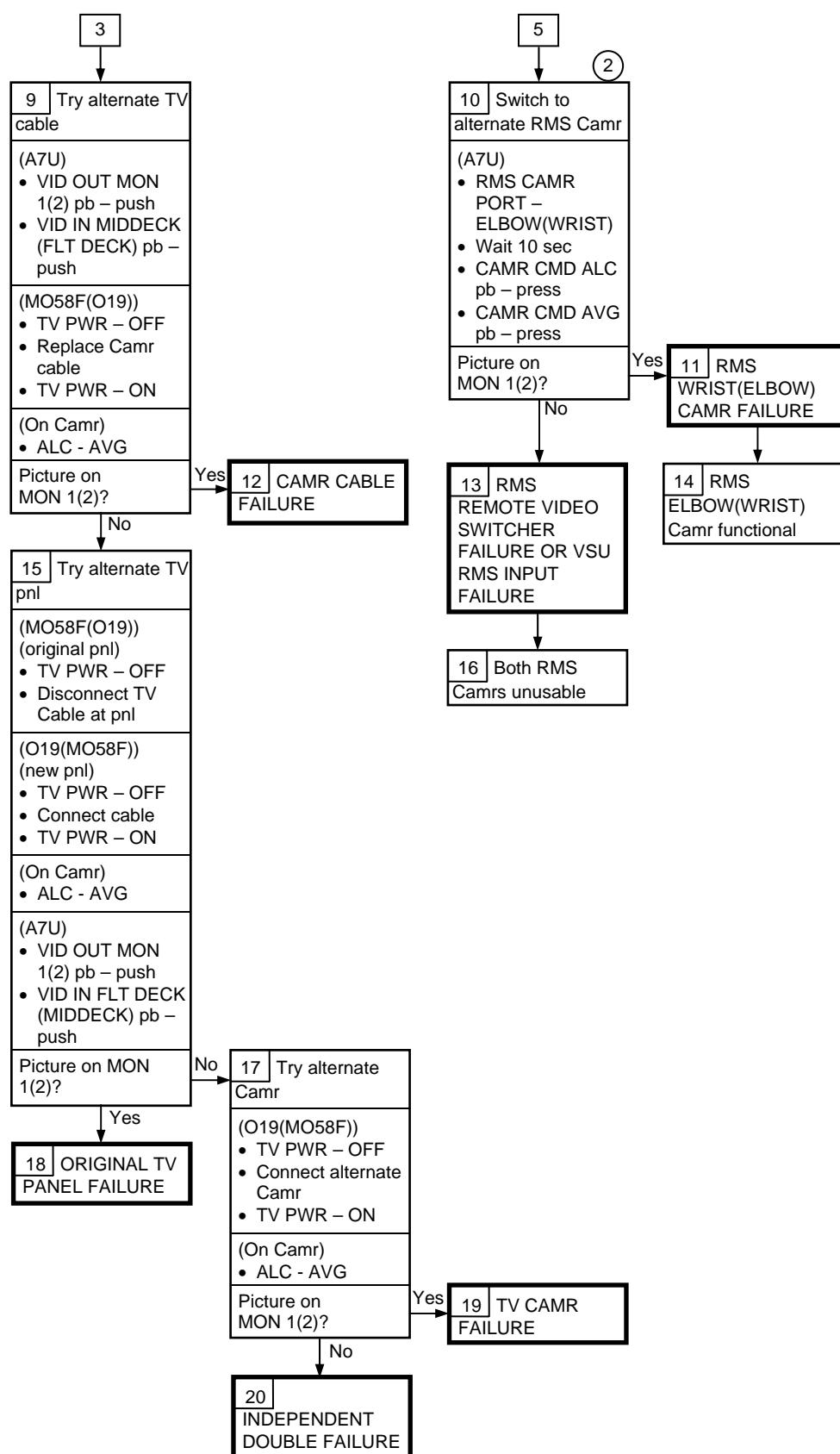


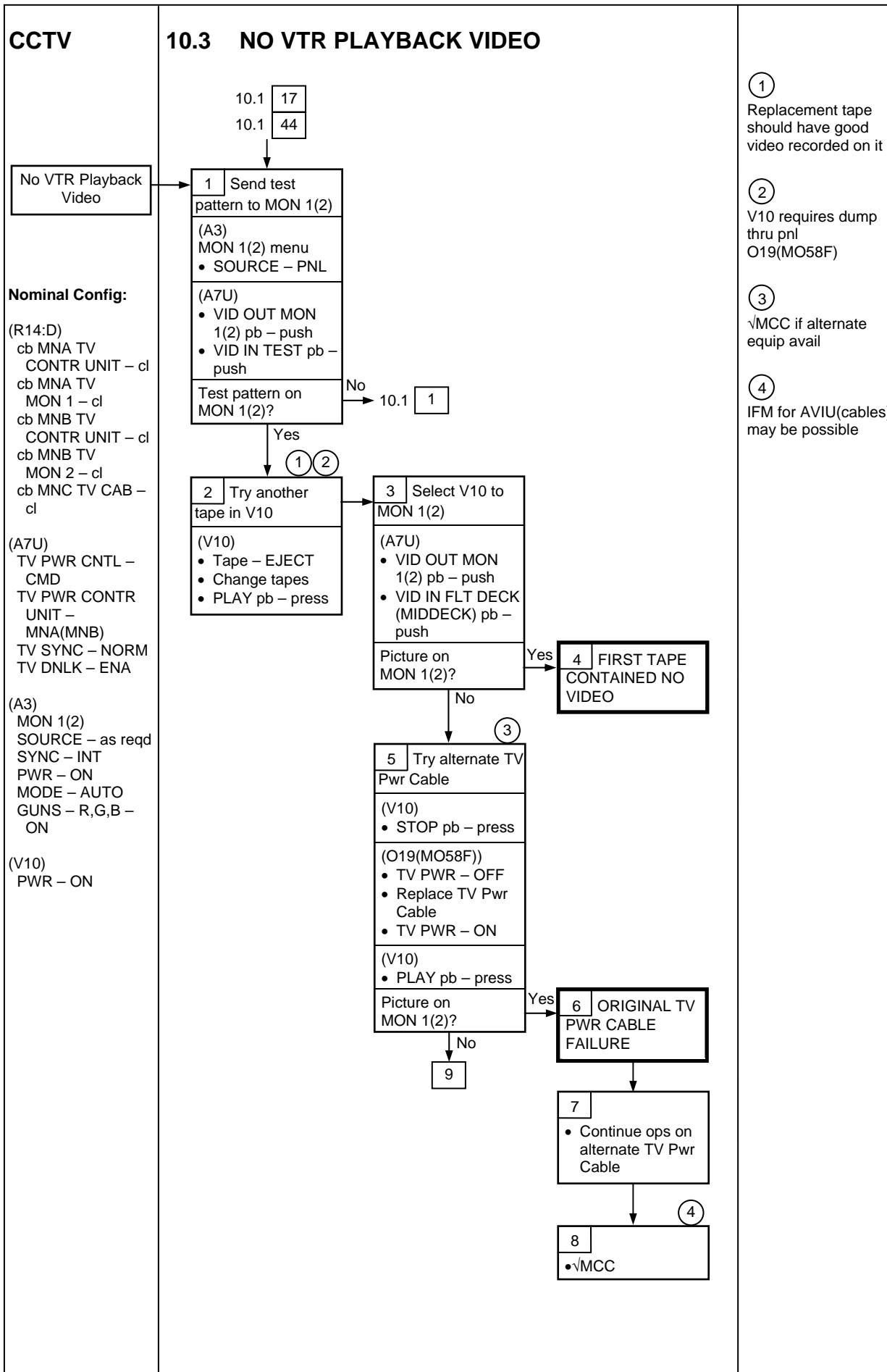
(10)

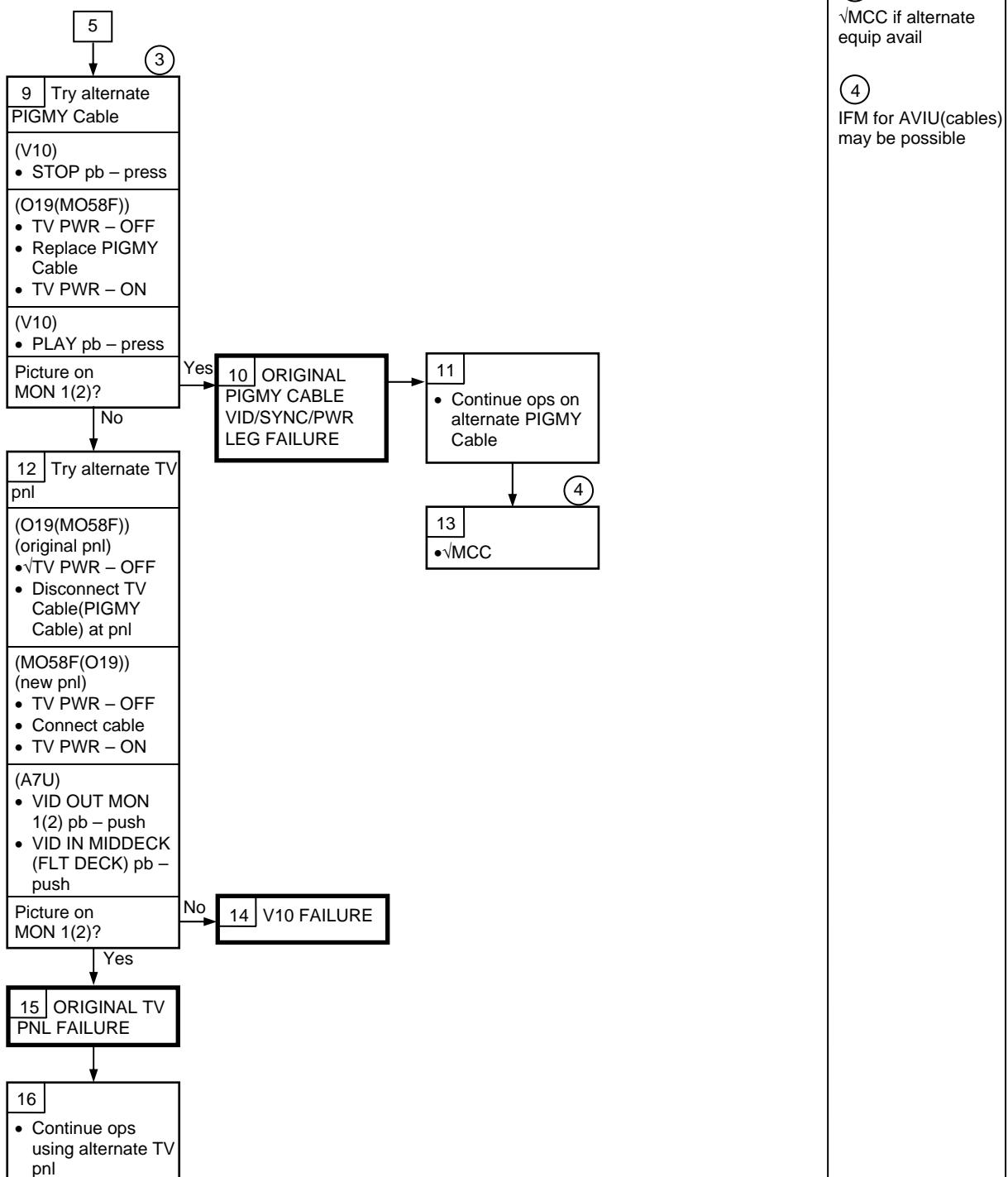
If DNLK in progress,  
selecting test pattern  
to DNLK not reqd.  
MCC will advise on  
DNLK status

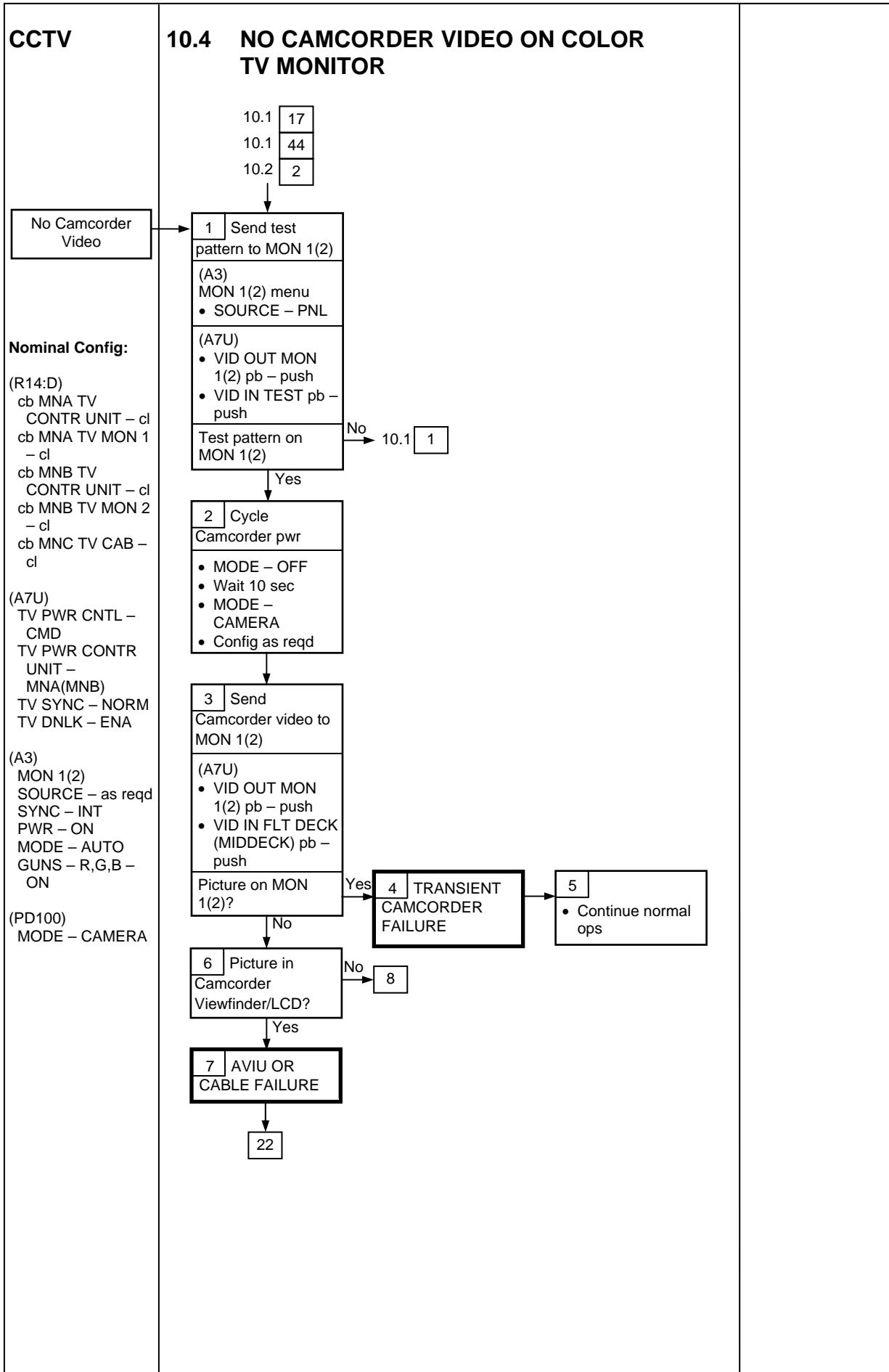






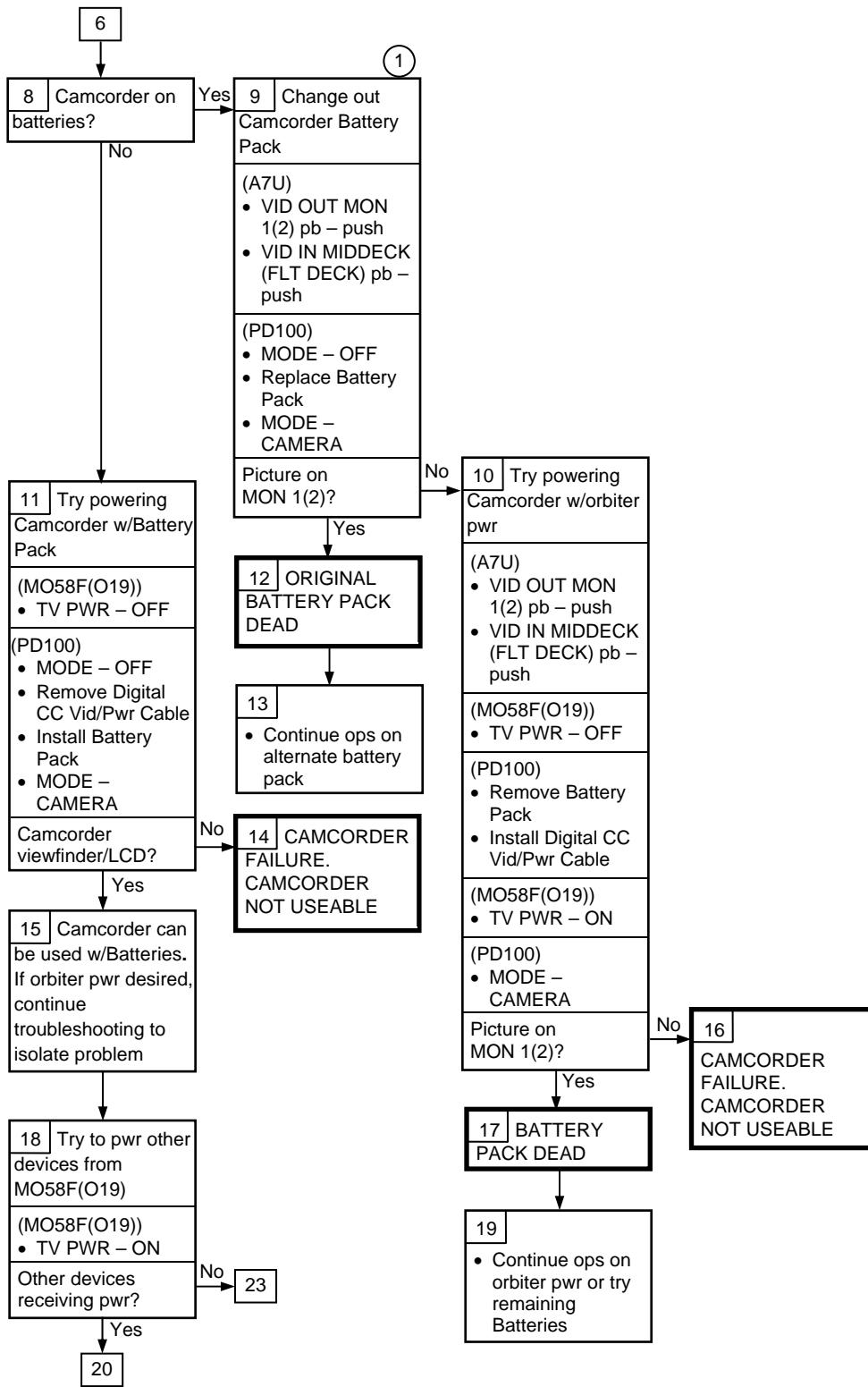






## CCTV

## 10.4 (Cont)

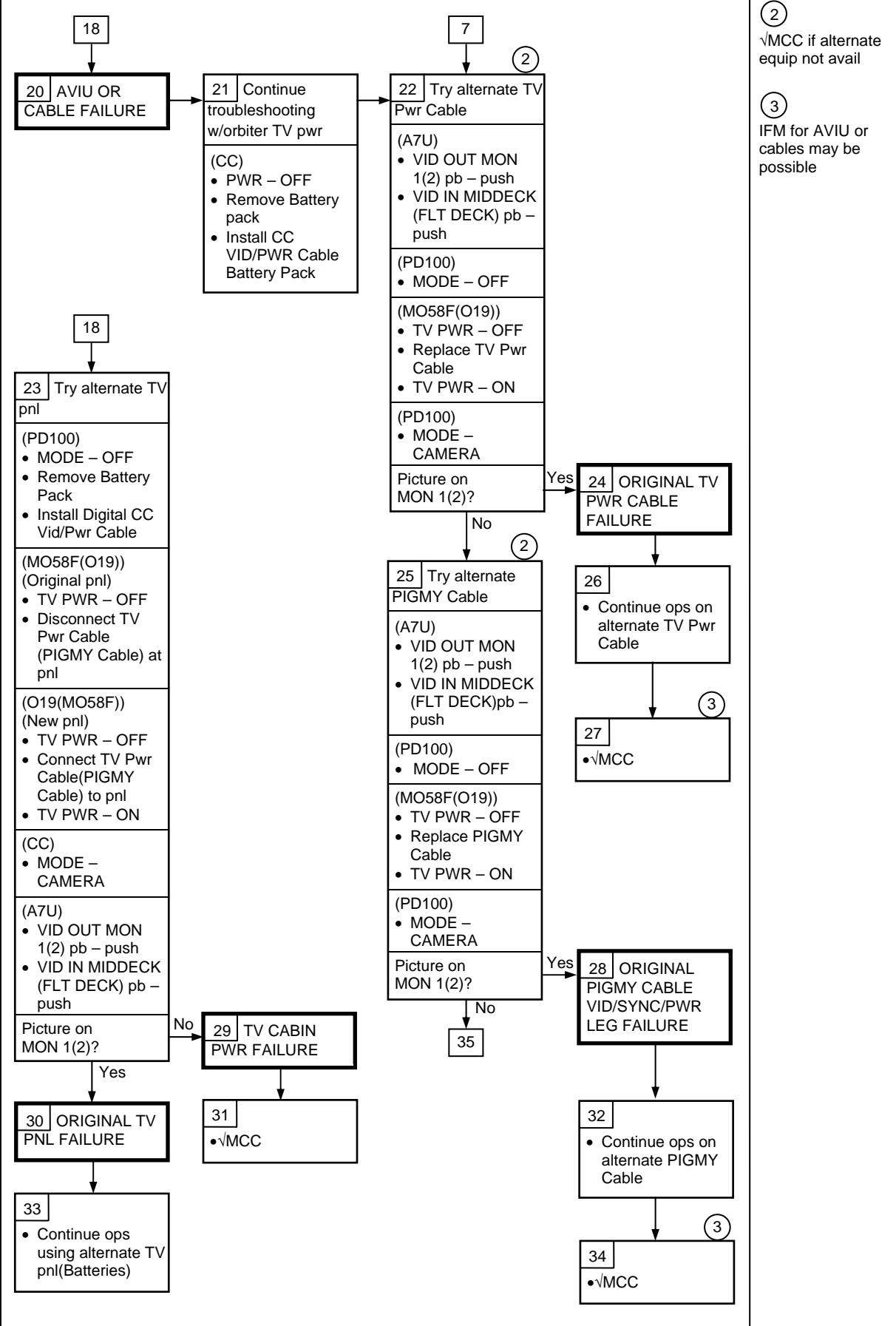


(1)

Video link from Camcorder to orbiter TV pnl should already be connected via Digital CC Vid/Pwr cable, AVIU, and TV Pwr cable when viewing Camcorder video on orbiter color TV monitor

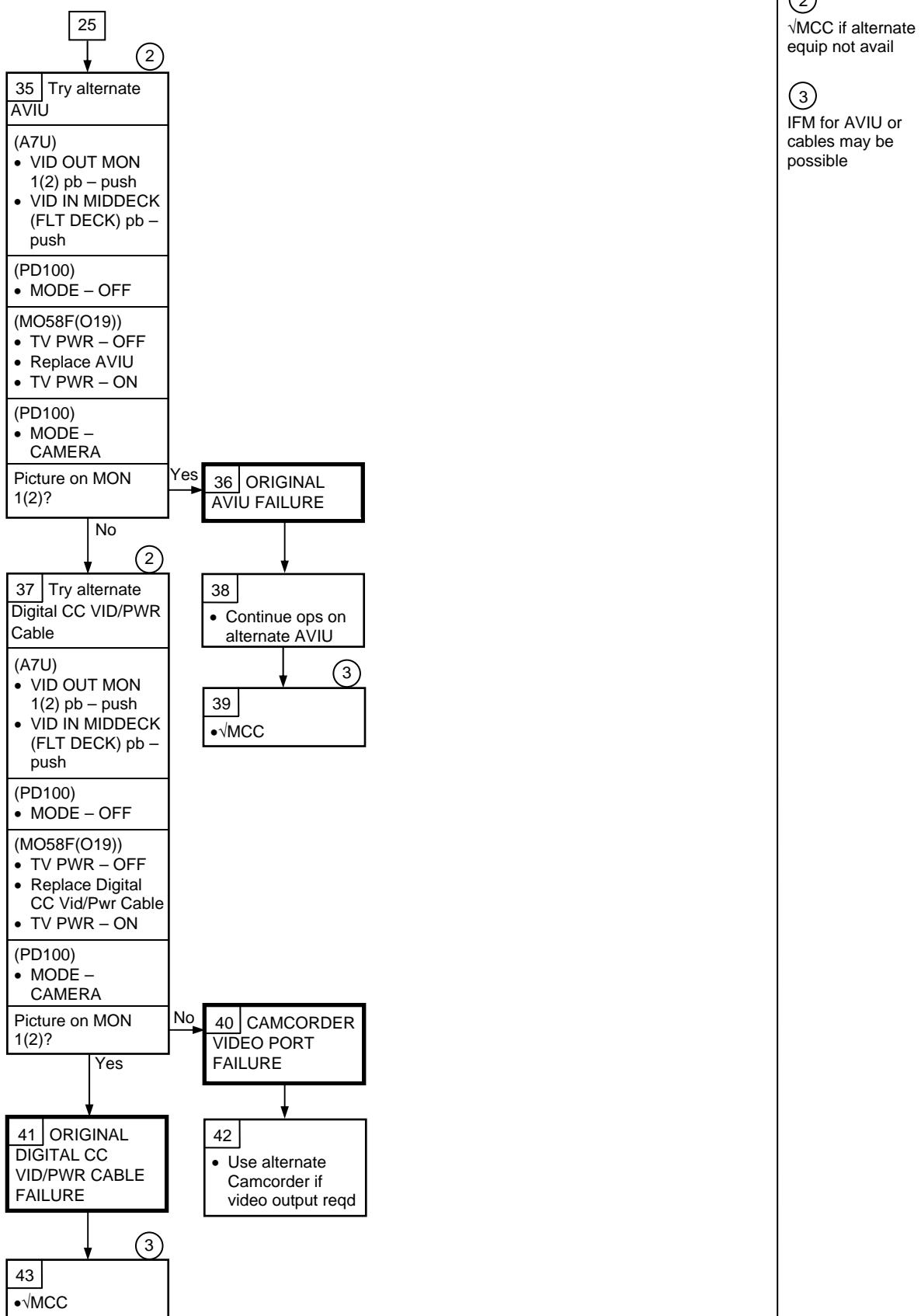
## CCTV

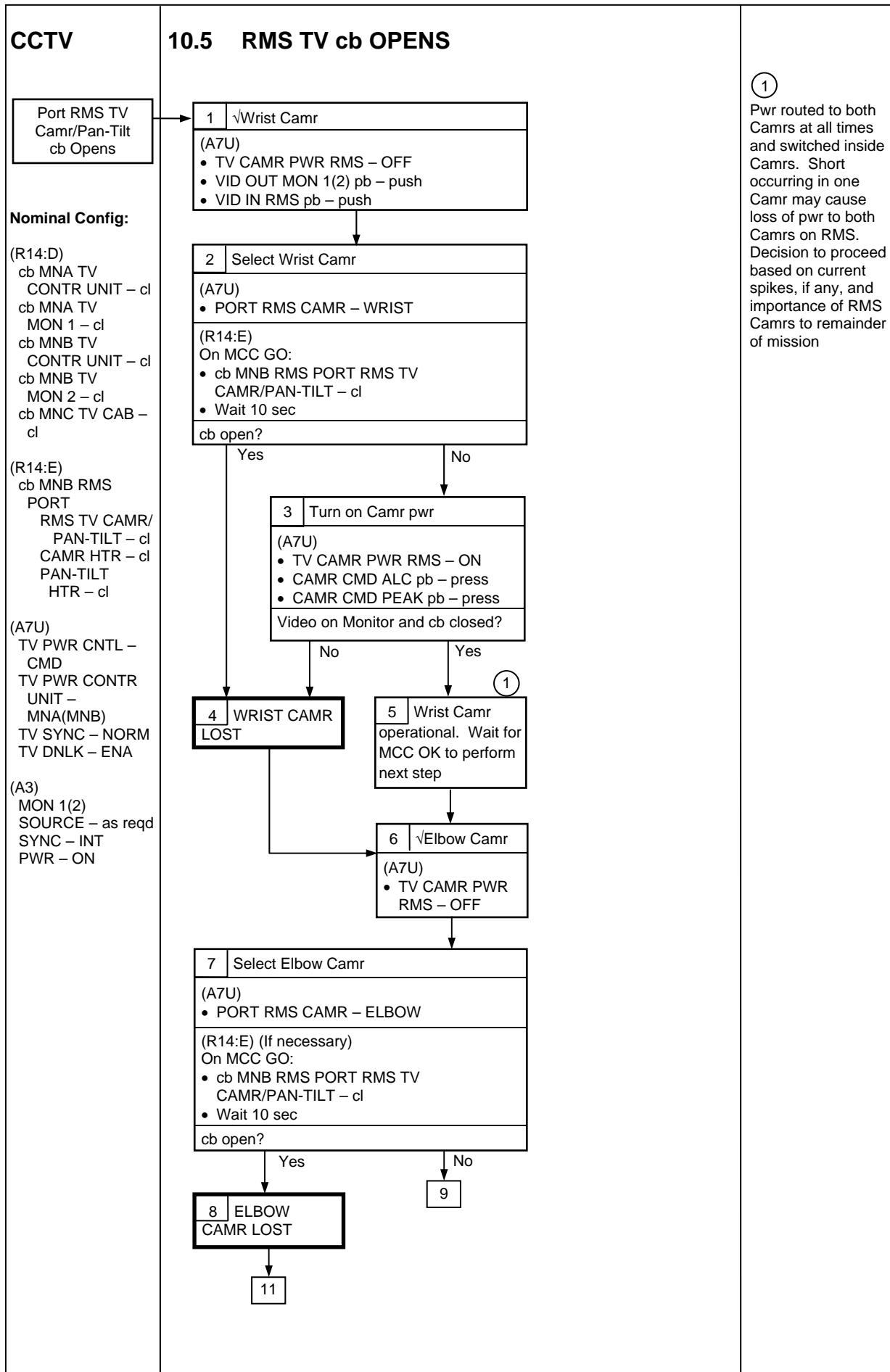
## 10.4 (Cont)

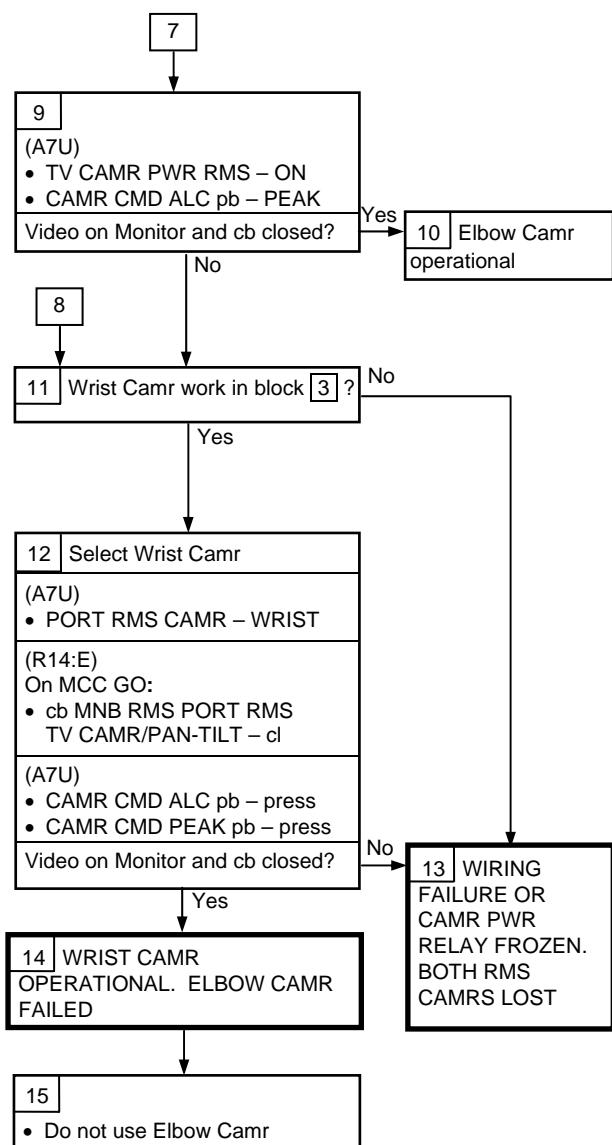


## CCTV

## 10.4 (Cont)







## CENTERLINE (C/L) CAMR

	<u>PAGE</u>
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C/L CAMR VIDEO TROUBLESHOOT.....	11-5
C/L CAMR MISALIGNMENT .....	11-8
C/L CAMR OPS FOR VSU FAIL .....	11-10

**CENTERLINE (C/L) CAMR****C/L CAMR INSTALL**

L12 (SSP 2)    1. ODS C/L Camr Config  
                   √C/L CAM PWR – OFF

R12 (VPU)    √SEC C/L Cap installed  
                   √Green Jumper – SEC C/L  
                   √VPU Pwr – ON (LED on)

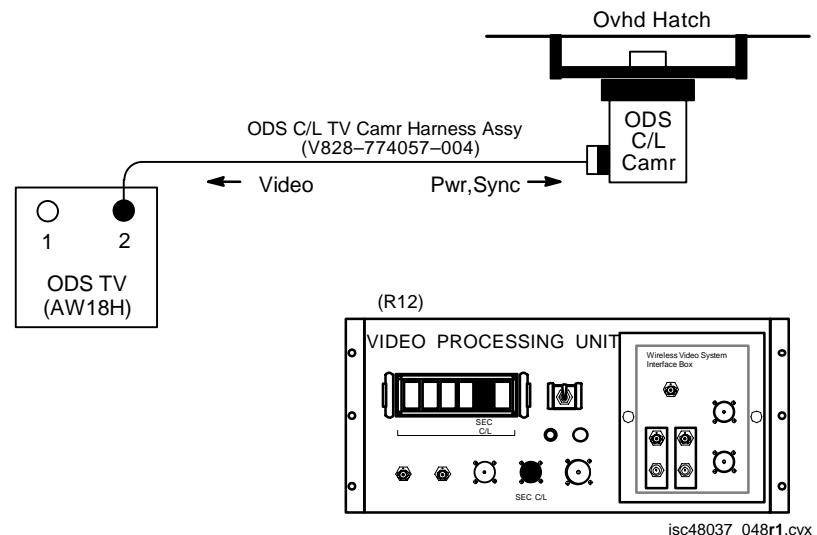
ML60B        Unstow C/L Camr, ODS C/L TV Camr Harness Assy

NOTE  
     When connecting ODS C/L TV  
     Camr Harness Assy, verify pins  
     to socket connection

ODS            √ODS C/L Camr Brkt mounted securely  
                 Mount C/L Camr to ODS C/L Camr Brkt  
                   √Flex Duct attached to Camr brkt  
                 Config cable per dwg at right

C/L Camr      √SSF/STS sw – STS

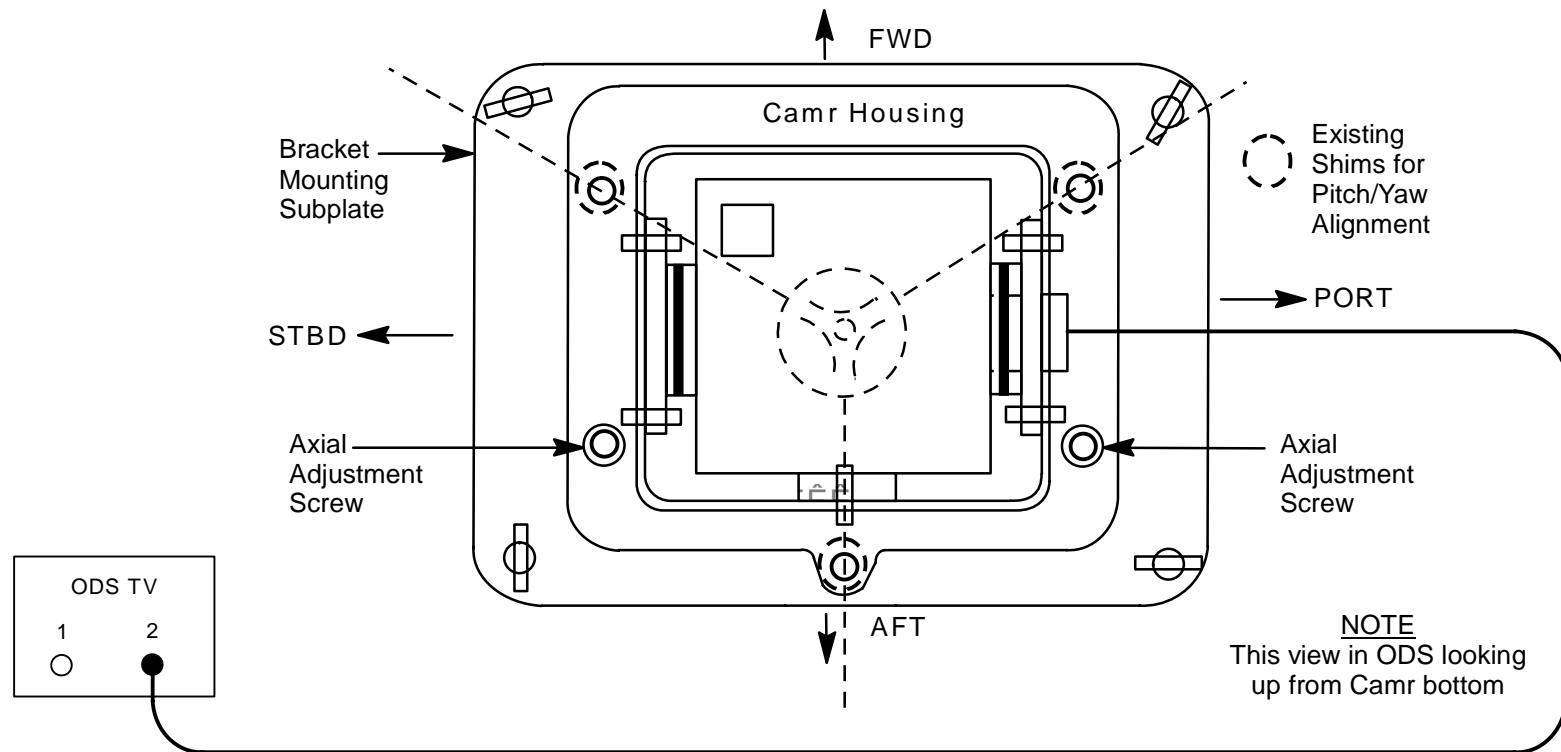
L12 (SSP 1)  
                   (SSP 2)    √cb SW PWR 1 (CB2) - cl  
                   C/L CAM PWR – SEC ON



## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR INSTALL (Continued)

#### 2. Camr Position Verification



ODS C/L TV Camr Harness Assy (8.5 ft)  
V828-774057-004

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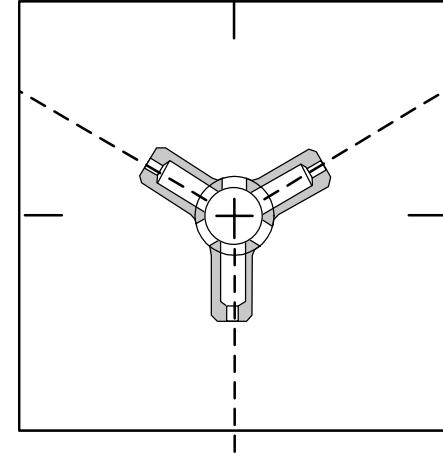
## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR INSTALL (Concluded)

#### 3. ODS C/L Camr Alignment Check

Perform ACTIVATION (Cue Card, TV) as reqd

- A7 VID OUT MON 1(2) pb – push  
IN PL2(VPU) pb – push  
ALC pb – push  
AVG pb – push
- MON 1(2) LDATA – ON  
CDATA – GRN  
XHAIR – GRN
- A7 Zoom to  $10^\circ \pm 0.5^\circ$   
Focus to see Xhair target



jsc48037\_050.cnv

#### NOTE

Green xhairs on monitor may move off center in calibration target when zooming in,out. Xhair will be closest to center at full zoom in position

- MON 1(2) ✓Vertical xhairs coincide w/vertical alignment wire and are parallel. If xhair marks overlay each other, no yaw(axial) alignment needed (see dwg above)  
✓Intersection of monitor vertical,horizontal xhair falls within target circular opening from  $\sim 10\text{--}40^\circ$  zoom range of Camr

Report results of both alignment verifications (at  $10^\circ$  and  $40^\circ$ ) to MCC

#### 4. Deactivation

- A7 CAMR CMD IRIS – CL  
L12 (SSP 2) C/L CAM PWR – OFF  
Go to DEACTIVATION (Cue Card, TV) as reqd

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR VIDEO TROUBLESHOOT

1. √C/L Camr nominal config:

ODS                    Camr SSF/STS sw – STS  
                      SEC C/L Camr connected via PRI C/L TV Camr Harness Assy to TV2 port

R12 (VPU)            √VPU SEC C/L Cap installed on SEC C/L

√Green Jumper – SEC C/L

√VPU PWR – ON (lt ON)

L12 (SSP 1)  
(SSP 2)            √cb SW PWR 1 (CB2) - cl  
                      C/L CAM PWR – SEC ON

A7                    VID OUT MON 1(2) pb – push  
                      IN PL2(VPU) pb – push

A3 (MON)            √C/L Camr Video

If no C/L Camr video on monitor:

2. Pwr-Cycle C/L Camr:

A7                    CAMR CMD IRIS – CL (hold 8 sec)  
L12 (SSP 2)            C/L CAM PWR – OFF, wait 10 sec, SEC ON

A7                    ALC pb – push  
                      AVG pb – push

A3 (MON)            √C/L Camr Video

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR VIDEO TROUBLESHOOT (Continued)

If still no C/L Camr video on monitor:

3. Change ODS TV port:

A7                   CAMR CMD IRIS – CL (hold 8 sec)  
L12 (SSP 2)       C/L CAM PWR – OFF

ODS                 Disconnect PRI C/L TV Camr Harness Assy from TV2 port  
                        Connect PRI C/L TV Camr Harness Assy to TV1 port

R12 (VPU)          √VPU SEC C/L Cap installed on PRI C/L  
                        Green Jumper – PRI C/L

L12 (SSP 2)        C/L CAM PWR – PRI ON

A7                   ALC pb – push  
                        AVG pb – push

A3 (MON)          √C/L Camr Video

If still no C/L Camr video on monitor:

4. Change C/L TV Camr Harness Assy:

A7                   CAMR CMD IRIS – CL (hold 8 sec)  
L12 (SSP 2)       C/L CAM PWR – OFF

ML60M              Unstow B/U C/L TV Camr Harness Assy  
ODS                  Disconnect PRI C/L TV Camr Harness Assy from ODS TV1 port and PRI C/L Camr  
                        Connect B/U C/L TV Camr Harness Assy to ODS TV1 and PRI C/L Camr

L12 (SSP 2)        C/L CAM PWR – PRI ON

A7                   ALC pb – push  
                        AVG pb – push

A3 (MON)          √C/L Camr Video

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR VIDEO TROUBLESHOOT (Concluded)

If still no C/L Camr video on monitor:

5. Install B/U C/L Camr:

A7                   CAMR CMD IRIS – CL (hold 8 sec)  
L12 (SSP 2)       C/L CAM PWR – OFF

ML60M             Unstow B/U C/L TV Camr  
ODS                 Disconnect B/U C/L TV Camr Harness Assy from PRI C/L Camr  
                     Remove PRI C/L Camr from ODS C/L Camr Brkt  
                     Mount B/U C/L Camr to ODS C/L Camr Brkt  
                     Connect B/U C/L TV Camr Harness Assy to B/U C/L Camr  
L12 (SSP 2)       C/L CAM PWR – PRI ON

A7                 ALC pb – push  
                     AVG pb – push  
A3 (MON)         √C/L Camr Video

If video, perform C/L CAMR INSTALL, step 3

If still no C/L Camr video on monitor:

6. √MCC

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR MISALIGNMENT

If green xhair outside inner diameter of circular portion of calibration target during PRI C/L Camr alignment, perform following:

1. Describe to MCC location of xhair in relation to target circle. Reference dwgs, 11-9
2. Remove, re-install Camr to bridge. Recheck alignment per C/L CAMR INSTALL, step 3

Perform each of the remaining steps if misalignment persists:

3. Remove, re-install mounting bridge to ODS. Recheck alignment per C/L CAMR INSTALL, step 3
4. Shim Camr/bridge interface:
  - a. Obtain feeler gauges from ML60B Primary C/L Foam
  - b. Loosen fasteners on Camr/bridge interface
  - c. Insert feeler gauge between Camr brkt and bridge as appropriate to center x-hair and tighten fasteners
  - d. Recheck alignment per C/L CAMR INSTALL, step 3
  - e. Repeat as reqd w/different sized feeler gauges or shim locations until x-hair within target circle
- ML60M      5. Install SEC C/L Camr using PRI C/L Camr Harness Assy and ODS TV Port 2 (no change to VPU selections):

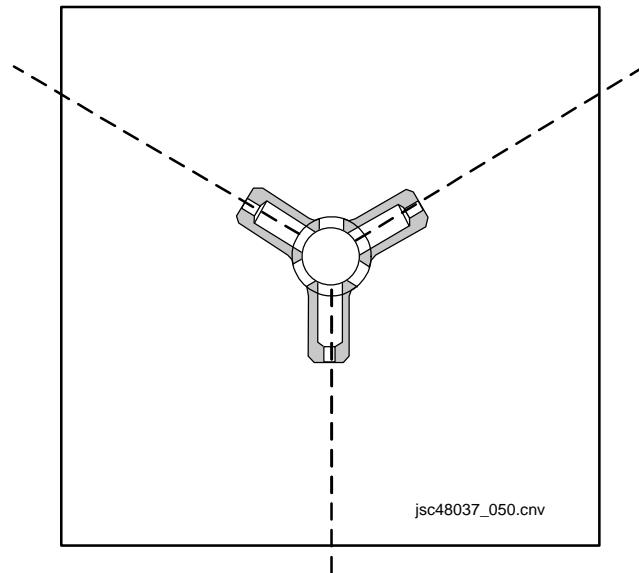
A7	CAMR CMD IRIS – CL (hold 8 sec)
L12 (SSP 2)	C/L CAM PWR – OFF
ODS	Disconnect Camr Harness Assy from PRI C/L Camr
	Replace PRI C/L Camr w/SEC C/L Camr
L12 (SSP 2)	Connect Camr Harness Assy to SEC C/L Camr
A7	C/L CAMR PWR – SEC ON
	ALC pb – push
	AVG pb – push

Check alignment per C/L CAMR INSTALL, step 3. Describe misalignment to MCC per step 1

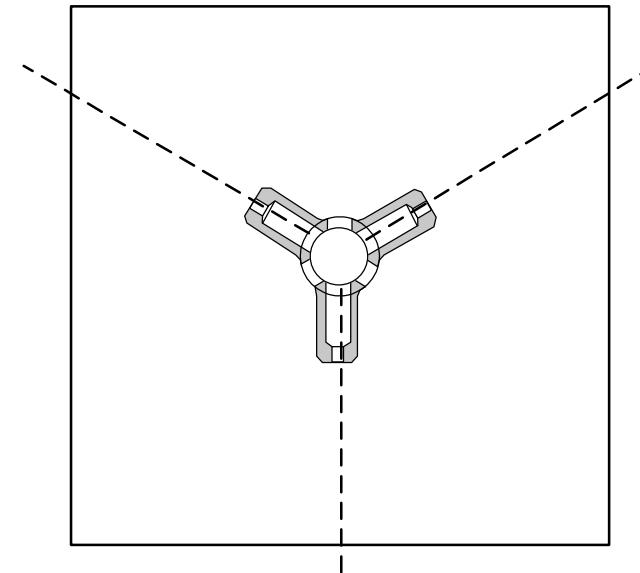
6. Repeat step 4 for SEC C/L Camr
7. If shimming both PRI and SEC C/L Camrs fails to bring xhair within target circle, re-install Camr w/best alignment. Report which Camr installed
8. √MCC to determine if ODS CENTERLINE CAMR ANGULAR ALIGNMENT (IFM, PROCEDURES M THRU R) reqd

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR MISALIGNMENT (Concluded)



PRI C/L CAMR



SEC C/L CAMR

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## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR OPS FOR VSU FAIL

#### 1. Setup

Obtain:

- TVCU/CIP I/F Cable
- TVCU
- Camr Cont/CTVM Cable
- TV Pwr Cable (20 ft) (2)
- AVIU LCD Cable
- LCD
- RS-232 Cable
- PGSC
- PGSC Pwr Cable(s)
- PIGMY
- AVIU
- V10
- MON to VIU/CM Cable
- Digital CC VID/PWR Cable
- AVIU-CC VID Cable

A3  
R14:D  
A3

- ✓MON 2 PWR – OFF
- cb MNB TV MON 2 – op
- Disconnect Pwr MNB from MON 2 J1

Config per dwg, 11-11

TVCU  
O19  
L12  
(SSP 2)

PGSC

R14:D  
A3

V10

LCD

PGSC

#### 2. Activation

CENTERLINE/CAMCORDER sw – CENTERLINE  
TV Pwr – ON  
C/L CAM PWR – SEC ON

PGSC PWR SOURCE – ON  
PGSC – ON

cb MNB TV MON 2 – cl  
MON 2 PWR – ON

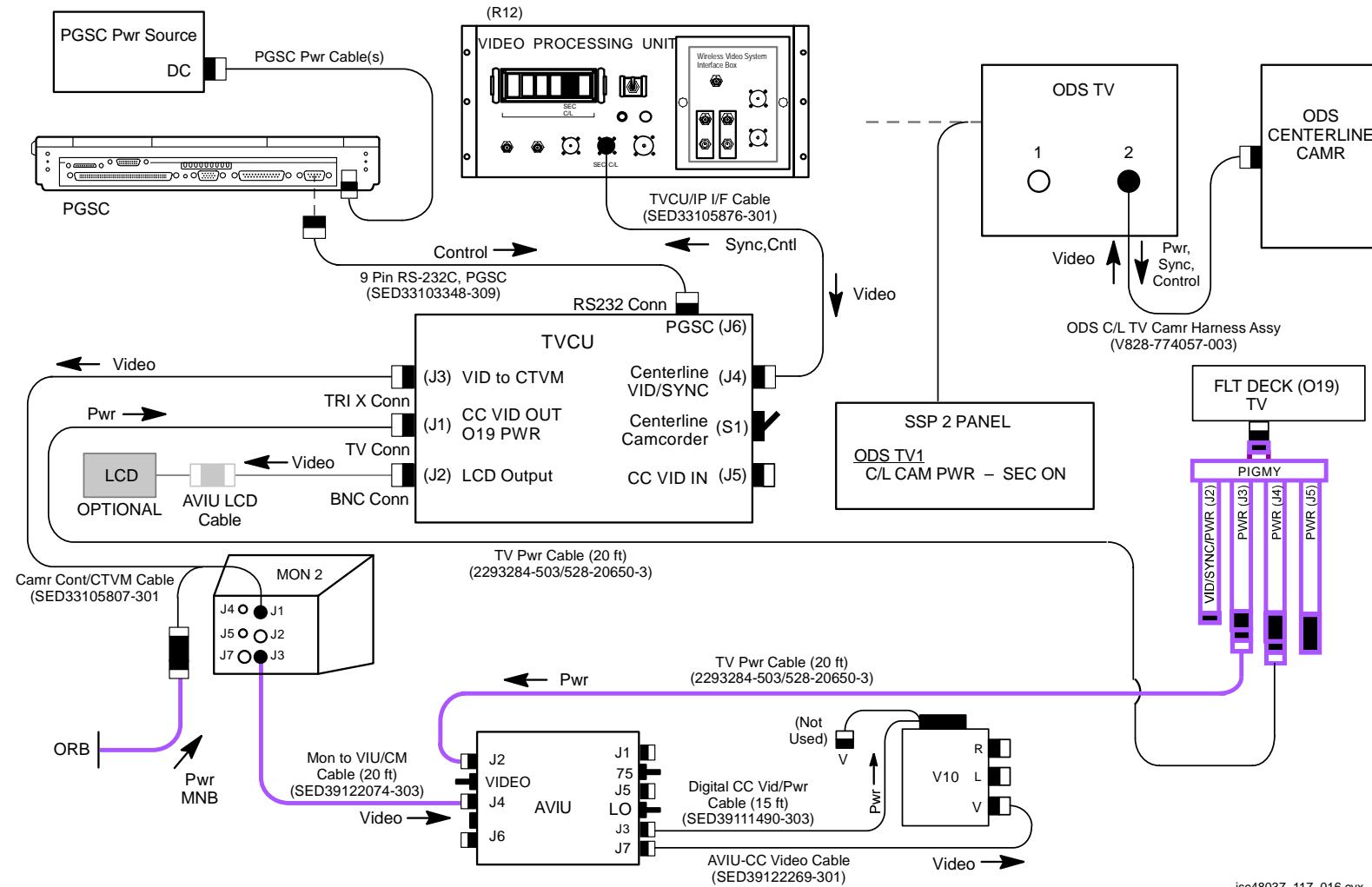
PWR – ON (LED on)  
✓Tape – Installed

PWR – ON

RUN TV CONTROLLER program  
SHUTTLE Aps (double-click)  
TV Controller (double-click)  
Sel 'YES' in dialog box  
CTVC CONTROLLER menu  
CAMERA (click)  
P2 (click)  
ALC – AVG (click)  
Return to P/TV scene as reqd  
CTVC CONTROLLER menu  
✓Zoom,Iris,Focus as reqd

## CENTERLINE (C/L) CAMR (Continued)

### C/L CAMR OPS FOR VSU FAIL (Continued)



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## CENTERLINE (C/L) CAMR (Concluded)

### C/L CAMR OPS FOR VSU FAIL (Concluded)

3. Deactivation
  - PGSC            CTVC CONTROLLER menu
    - IRIS – CLOSE
    - QUIT
  - PGSC – OFF
  - PGSC Pwr Source – OFF
- L12 (SSP 2)    C/L CAM PWR – OFF
- O19            TV Pwr – OFF
- LCD            PWR – OFF
- MON 2          Pwr – OFF  
                  Stow hardware as reqd

## DTV

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## DTV

## SETUP

1. Config Panels

Config H/W per dwg at right

L10 (MUX) VTR/CC PWR – on (LED on)

If dnlk:

MUX/VTR/CC PWR – on (LED on)  
✓MUX BYPASS – ACT

(VIP) ✓ATU – REC

✓CCTV VIDEO IN – J3

PWR – on (LED on, DATA FLOW LED  
flashes twice)

(VTR) ✓ON/STANDBY LED – green

✓TIMER – OFF

✓KEY INH – OFF

✓CHARACTER DISPLAY (LCD) – ON (not BLACK BACK)

✓CHARACTER DISPLAY – OFF

✓INPUT SELECT – VIDEO

✓COUNTER SELECT – COUNTER (TC)

✓AUDIO INPUT – FIX

✓Tape installed (Tape icon LED on)

2. Config Video

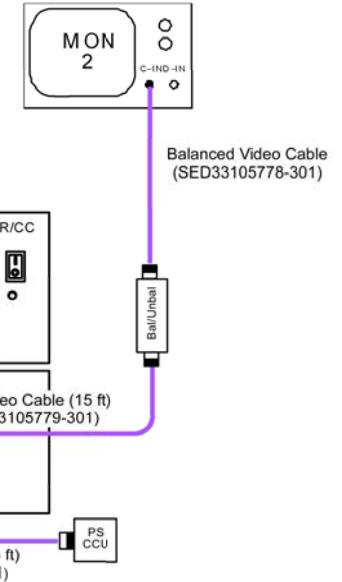
SOURCE – C

3. Config Audio

PS AUD PWR – AUD

Desired Loops – RCV, Vol tw-5

Other Loops – OFF



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## **DTV (Continued)**

### **SPECIFICATIONS**

#### VIP

PWR SOURCE: 400 Hz A/C via AC2 PAYLOAD 3Φ (MA73C:E)

PWR DRAW: 6.84 Watts

FUSES: F1 = 5 amp

F2 = 2 amp

WEIGHT: 4.19 lb

DIMENSION: 10.5" (L) X 5.25" (W) X 2.69" (H)

#### VTR (SONY DSR-25)

PWR SOURCE: 13.2 VDC via MUX

PWR DRAW: 12.88 to 33.6 Watts (depending on mode)

TAPE: Standard DVCAM or Mini DVCAM

TAPE LENGTH: 3 hr or 40 min

AUDIO: 2 Channel, 16 bit at 48 KHz

CLOCK PWR: 300 hr internal rechargeable capacitor (after 8 hr charge)

OPERATING TEMP: 41 degF to 104 degF

WEIGHT: 9 lb

DIMENSION: 15.5" (L) X 8.37" (W) X 3.87" (H)

#### MUX

PWR: 28 VDC via PAYLOAD AUX bus (R1)

PWR DRAW: 39.76 to 72.8 Watts (depending on VTR,CC config)

FUSE: 5 amp

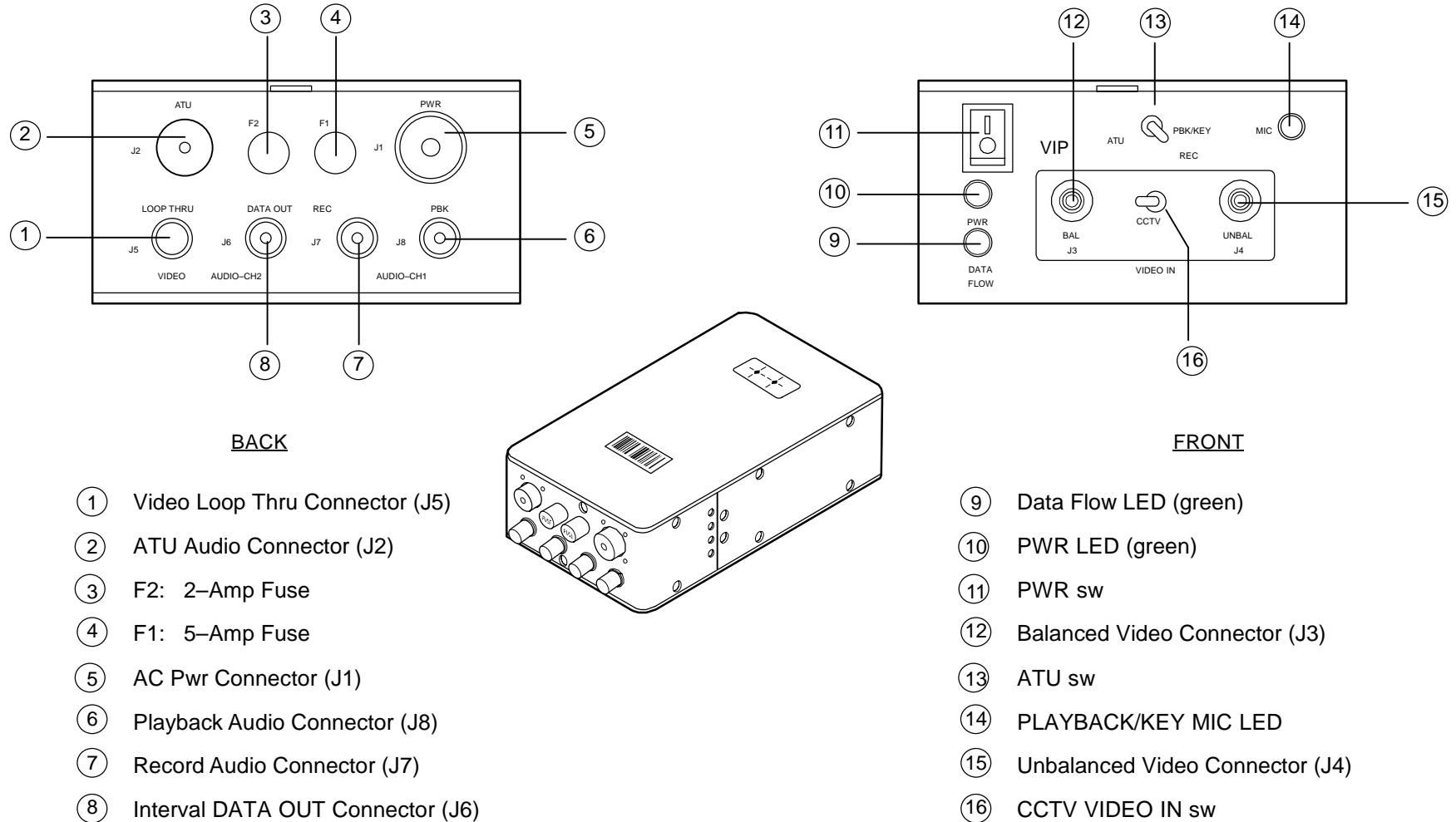
WEIGHT: 15.2 lb

DIMENSION: 19" (L) X 17.88" (W) X 3.45" (H)

## DTV (Continued)

### NOMENCLATURE

VIP



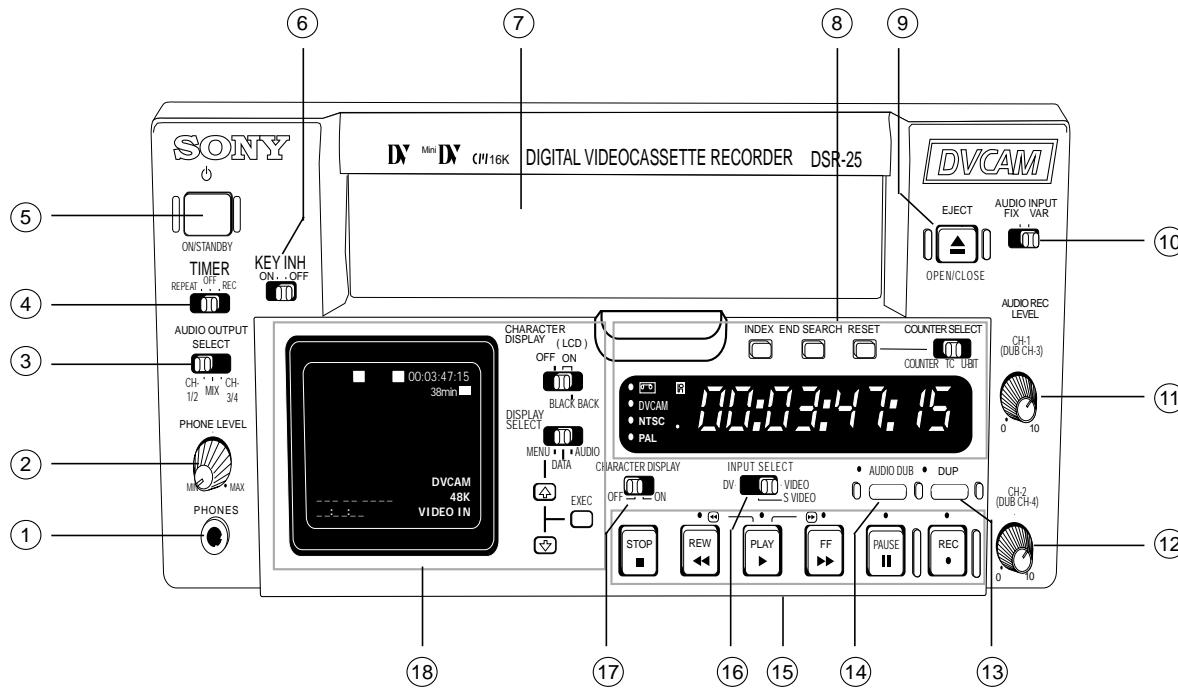
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## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – FRONT PANEL

|



- ① Phone Jacks
- ② PHONE LEVEL Control kb
- ③ AUDIO OUTPUT SELECT sw (N/A)
- ④ TIMER sw (OFF)
- ⑤ ON/STANDBY pb, LED (red/green)
- ⑥ KEY INH sw (OFF)
- ⑦ Cassette Compartment
- ⑧ Display Window and Controls
- ⑨ EJECT pb
- ⑩ AUDIO INPUT sw (FIX)
- ⑪ CH-1 AUDIO REC LEVEL Control kb (N/A)
- ⑫ CH-2 AUDIO REC LEVEL Control kb (N/A)
- ⑬ DUP pb (not used)
- ⑭ AUDIO DUB pb (N/A)
- ⑮ Tape Transport Controls
- ⑯ INPUT SELECT sw (VIDEO)
- ⑰ CHARACTER DISPLAY sw
- ⑱ Monitor Display and Controls

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## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – FRONT PANEL (Concluded)

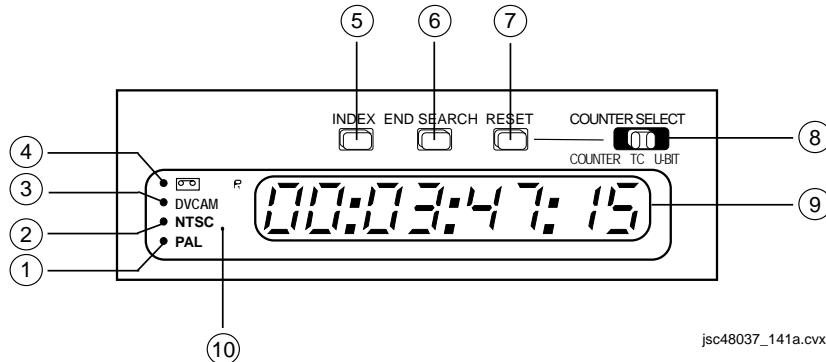
(1)	PHONES jack	Stereo headphone connection point to monitor live(playback) audio
(2)	PHONE LEVEL kb	Controls headphone jack volume level
(3)	AUDIO OUTPUT SELECT sw (N/A)	Determines which audio channels are output in 32 kHz mode only
(4)	TIMER sw (OFF)	Used to auto repeat a tape or automatically start recording once pwr is applied to VTR
(5)	ON/STANDBY pb, LED (red/green)	Changes pwr mode of VTR between STANDBY (red LED) and ON (green LED). Will automatically go to ON when MUX pwr applied
(6)	KEY INH sw (OFF)	Disables all pbs when ON
(7)	Cassette Compartment	Tape insertion location, door opened/closed via EJECT pb
(8)	Display windows and controls	See 12-7 for details
(9)	EJECT pb	Opens/closes cassette compartment door and ejects tape, if installed
(10)	AUDIO INPUT sw (FIX)	Enables/disables AUDIO REC LEVEL control knobs. FIX sets fixed gain based on AUDIO INPUT LEVEL sw on rear of VTR
(11)	CH-1 AUDIO REC LEVEL kb (N/A)	Controls audio level of orbiter audio if AUDIO INPUT sw (VAR)
(12)	CH-2 AUDIO REC LEVEL kb (N/A)	Controls audio level for VI data if AUDIO INPUT sw (VAR)
(13)	DUP pb (not used)	Used for tape-to-tape recording to duplicate the time code
(14)	AUDIO DUB pb (N/A)	Used for tape-to-tape recording to duplicate the 32 kHz mode audio channels
(15)	Tape Transport Controls	See 12-8 for details
(16)	INPUT SELECT sw (VIDEO)	Determines which video input jack the VTR will process
(17)	CHARACTER DISPLAY sw	Determines if VTR monitor text is displayed in VTR OUT video
(18)	Monitor Display and Controls	See 12-9 for details

## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – DISPLAY WINDOW AND CONTROLS

|



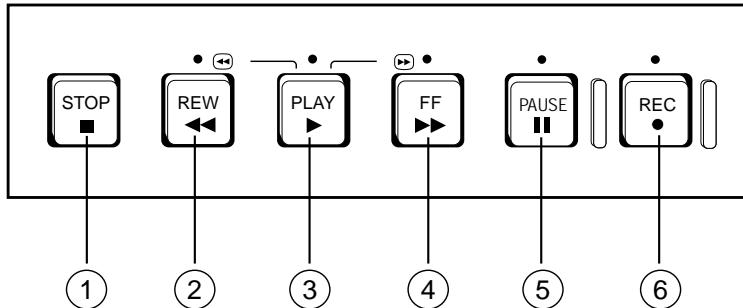
jsc48037\_141a.cvx

1	PAL Indicator/Amber (not used)	Lit when NTSC/PAL sw is in PAL posn or PAL formatted video being processed by the VTR
2	NTSC Indicator/Amber (on)	Lit since NTSC/PAL sw is in NTSC posn or NTSC formatted video being processed by the VTR
3	DVCAM Indicator/Amber (on)	Lit when the VTR is playing a DVCAM-formatted tape or when the VTR is set to DVCAM
4	Cassette Indicator/Amber	Lit solid when a tape is loaded into the VTR. Flashes during tape ejection
5	INDEX pb	Initiates index mark on the tape that can be used to cue the tape to that posn on the tape via INDEX SEARCH
6	END SEARCH pb	VTR will search for the last 5 sec of recorded video, play it, and return to stop mode
7	RESET pb	Resets COUNTER displayed numbers to all zeroes
8	COUNTER SELECT sw	Determines which time data will be displayed in the counter display
	COUNTER	Count value of the counter ( $\pm$ HH:MM:SS:FF)
	TC	Time code (DD:HH:MM:SS:FF)
	U-BIT	User bits (not used)
9	Time Counter Display	Displays time data (counter/time code/user bits). Self-diagnosis code numbers or error msgs
10	Remote Control Detector	Self explanatory

## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – TAPE TRANSPORT CONTROLS



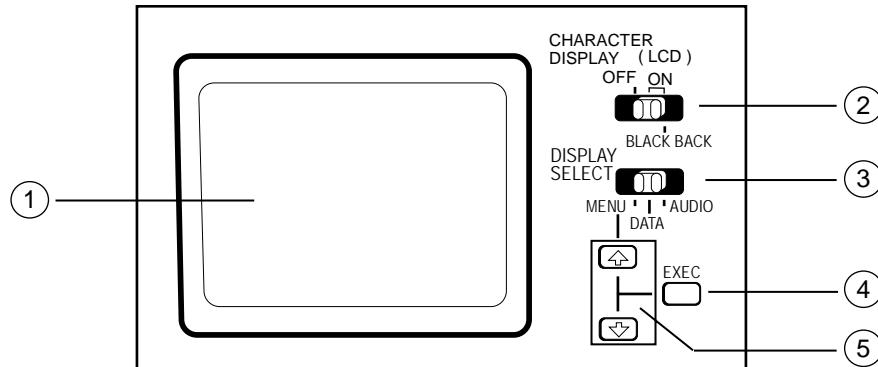
jsc48037\_141b.cvx

(1)	STOP pb	Stops current tape transport operation
(2)	REW pb/Indicator/Amber	Rewinds tape and illuminates the REW indicator. Video not visible unless held during play or play/pause mode
(3)	PLAY pb/Indicator/Green	Starts playback ops and illuminates the PLAY indicator
(4)	FF pb/Indicator/Amber	Fast forwards tape and illuminates the FF indicator. Video not visible unless held during play or play/pause mode
(5)	PAUSE pb/Indicator/Amber	Pauses playback or recording ops
(6)	REC pb/Indicator/Red	Pressing PLAY pb while holding in REC pb will start recording and both PLAY and REC indicators will illuminate. Just pressing REC pb will illuminate the REC indicator and allow for audio,video monitoring

## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – MONITOR DISPLAY AND CONTROLS



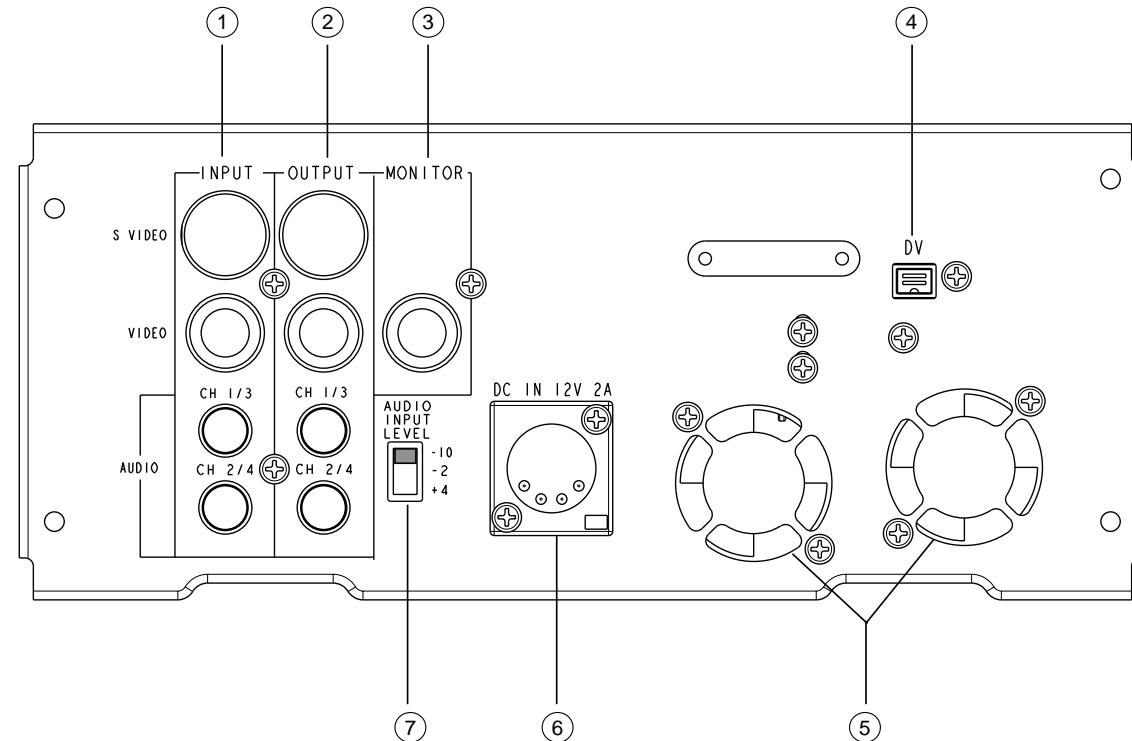
jsc48037\_141c.cvx

(1)	LCD Monitor	Displays playback(live) video and superimposed text, audio levels, and menu data
(2)	CHARACTER DISPLAY (LCD) sw	Controls the display of superimposed text on the monitor. BLACK BACK will block video flow to the monitor to provide a black background to improve superimposed data viewing
(3)	DISPLAY SELECT sw	Determine what superimposed data is displayed on the monitor
	MENU	Menu data
	DATA	VTR information
	AUDIO	Audio levels
(4)	EXEC pb	Executes and selects menu items
(5)	↑↓ pbs	Allows navigation thru and setting of menu items when in MENU mode, and adjusts monitor brightness when in DATA mode

## DTV (Continued)

### NOMENCLATURE (Continued)

#### VTR (SONY DSR-25) – REAR PANEL



- ① INPUT Jacks
- ② OUTPUT Jacks
- ③ MONITOR Jack
- ④ DV Jack
- ⑤ Cooling Fans
- ⑥ DC IN Connector
- ⑦ AUDIO INPUT LEVEL sw (-10)

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## DTV (Continued)

### NOMENCLATURE (Continued)

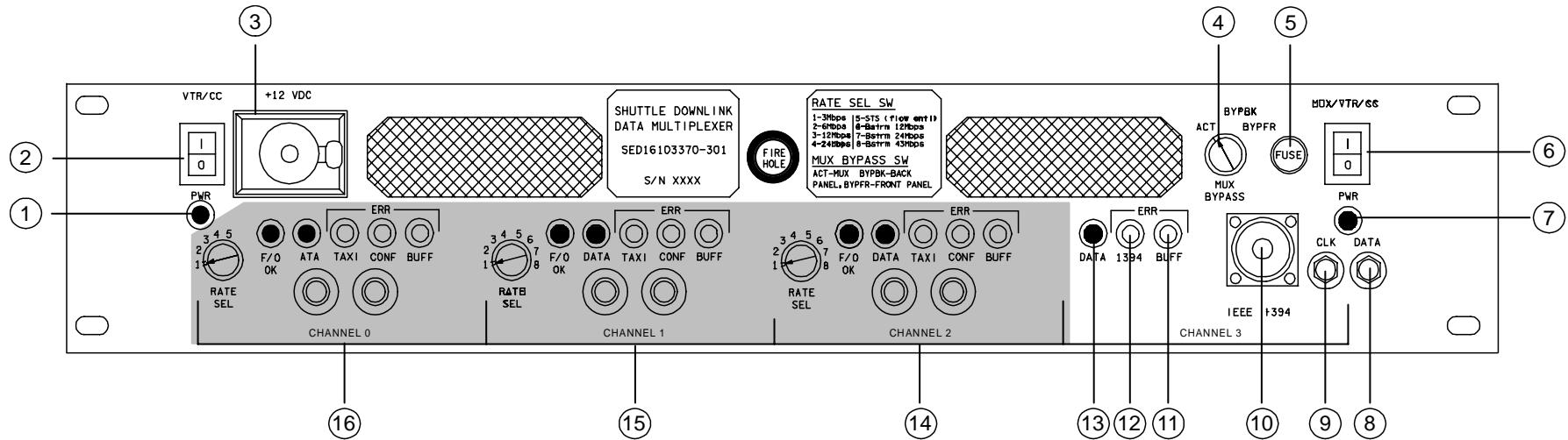
#### VTR (SONY DSR-25) – REAR PANEL (Concluded)

①	INPUT Jacks	Video and audio inputs
	S_VIDEO	Not used
	VIDEO	Video input of DTV signal from orbiter VSU
	AUDIO CH-1/3	Orbiter audio input
	AUDIO CH-2/4	Orbiter "VI" input
②	OUTPUT Jacks	Video and audio outputs
	S_VIDEO	Not used
	VIDEO	VTR OUT video
	AUDIO CH-1/3	Orbiter audio playback output
	AUDIO CH-2/4	Not used
③	MONITOR Jack	VTR MON Video (Note: Will not display VTR Playback Video)
④	DV Jack	IEEE 1394 4-pin video/audio connection
⑤	Cooling Fans	Reversed to bring air into unit
⑥	DC IN Connector	DC pwr source connection
⑦	AUDIO INPUT LEVEL sw	Sets the audio fixed gain level when the AUDIO INPUT is set to FIX. Is ignored in the VAR setting

## DTV (Continued)

### NOMENCLATURE (Continued)

#### MUX – FRONT



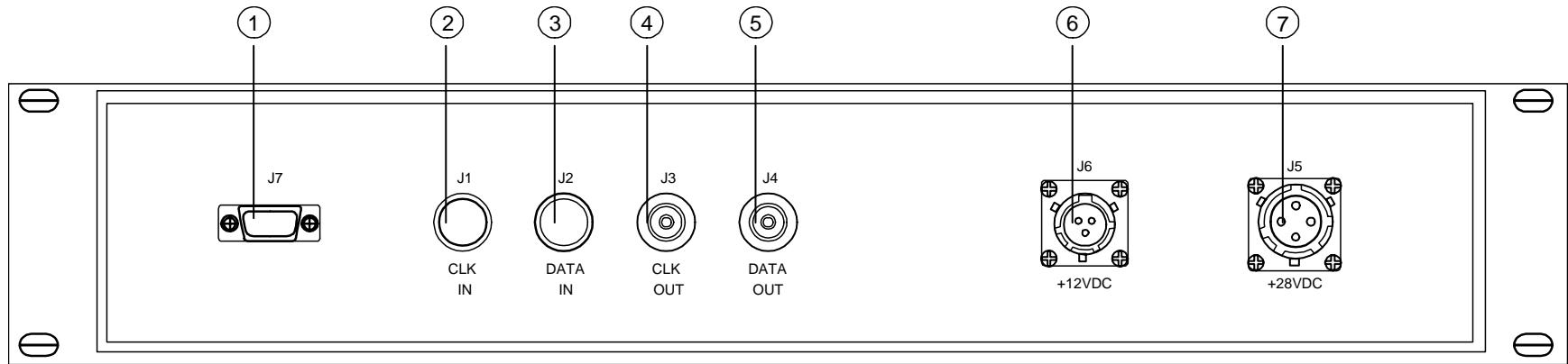
- |                           |                                       |
|---------------------------|---------------------------------------|
| ① VTR/CC PWR LED (green)  | ⑨ BYPFR CLOCK Connector               |
| ② VTR/CC PWR sw           | ⑩ IEEE 1394 Connector                 |
| ③ +12 VDC Connector (N/A) | ⑪ CHANNEL 3 BUFFER ERROR LED (yellow) |
| ④ MUX BYPASS sw           | ⑫ CHANNEL 3 1394 ERROR LED (yellow)   |
| ⑤ MUX 5-Amp Fuse          | ⑬ CHANNEL 3 DATA LED (green)          |
| ⑥ MUX/VTR/CC sw           | ⑭ CHANNEL 2 DATA Ports,LEDs (N/A)     |
| ⑦ MUX PWR LED (green)     | ⑮ CHANNEL 1 DATA Ports,LEDs (N/A)     |
| ⑧ BYPFR DATA Connector    | ⑯ CHANNEL 0 DATA Ports,LEDs (N/A)     |

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## DTV (Continued)

### NOMENCLATURE (Concluded)

#### MUX – BACK

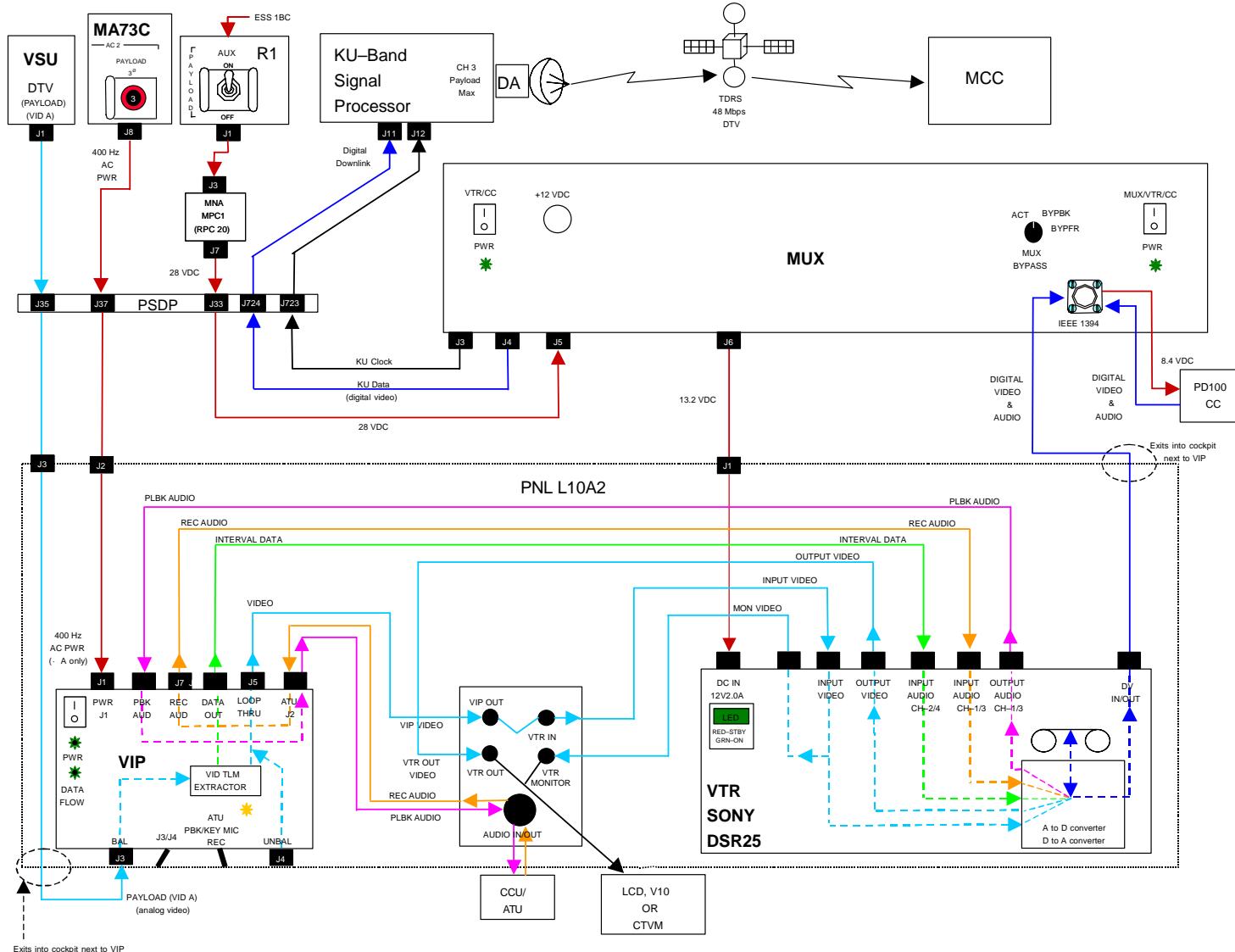


- ① DATA Port (N/A)
- ② CLOCK IN Connector (J1)
- ③ DATA IN Connector (J2)
- ④ CLOCK OUT Connector (J3)
- ⑤ DATA OUT Connector (J4)
- ⑥ +12 VDC OUTPUT Connector (J6)
- ⑦ +28 VDC INPUT Connector (J5)

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## DTV (Continued)

### DTV FUNCTIONAL SCHEMATIC



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## DTV (Continued)

### VTR CLOCK SET

1. Activate VTR

R1 √PL AUX – ON

L10 (MUX)      VTR/CC PWR – on (LED on)  
(VTR)            √ON/STANDBY LED – green

2. Set VTR clock to GMT

DISPLAY SELECT – MENU  
↓ pb – ETC, EXEC pb – push  
↓ pb – CLOCK SET, EXEC pb – push  
Use ↑,↓,EXEC to set Y,M,D,hr,min to GMT

DISPLAY SELECT – DATA

3. Deactivate VTR as reqd

(MUX)            ON/STANDBY – push (red LED on)  
                  VTR/CC PWR – off (LED off)

## DTV (Continued)

### MALS

#### 12.1 NO VIDEO AT VTR OUT

- A7 √Video Signal routed to VID OUT DTV pb
  - If using CTVM:
    - √SOURCE – C
- MON 2 R1 MA73C L10 (MUX) (VIP) (VTR) √PL AUX – ON √cb AC2 PL 3Φ – cl √VTR/CC(MUX/VTR/CC) PWR – on (LEDs on); if not, go to MAL 12.3 √CCTV VIDEO IN – J3 √PWR – on (LED on); if not, go to MAL 12.5 √DATA FLOW LED – on; if not, go to MAL 12.6 √ON/STANDBY LED – green √INPUT SELECT – VIDEO
  - If no joy, √MCC

#### 12.2 NO DIGITAL DNLK VIDEO AT MCC

- √Video from VTR MONITOR, if none, perform MAL 12.1
- √MCC has configured Ku Signal Band Processor CH3 for PL MAX
- L10 (MUX) PD100 L10 (MUX) (VTR) (MUX) √MUX BYPASS – ACT
  - If performing PD100 dnlk
    - √IEEE 1394 Batt Adapter Cable – IEEE 1394 port I/F
    - √IEEE 1394 Batt Adapter Cable – Camcorder I/F
  - If not performing PD100 dnlk
    - √IEEE 1394 male cable connected to IEEE 1394 port
    - DISPLAY SELECT – MENU
    - ↑(↓) pb – VTR, EXEC pb – push
    - ↓ pb – DVEE OUT, √ON
    - ↓ pb – RETURN, EXEC pb – push
    - DISPLAY SELECT – DATA
- √CHANNEL 3 DATA LED – on; if not, go to MAL 12.4
  - If no joy, √MCC for possible IEEE 1394 male cable replacement

## **DTV (Continued)**

### **MALS (Continued)**

#### **12.3 MUX PWR LED(s) OFF**

- R1 √PL AUX – ON
- L10 (MUX) √VTR/CC(MUX/VTR/CC) PWR – on (LEDs on)  
Notify MCC before proceeding  
√5 Amp Fuse (spare in DTV Fuse Kit)
- If no joy, √MCC

#### **12.4 MUX CHANNEL 3 DATA LED OFF**

- √DTV MAL 12.2 complete
- L10 (MUX)  
(VTR) If CHANNEL 3 1394,BUFF LEDs – on, signal not reaching MUX for processing  
| ON/STANDBY – push (red LED on)  
| If PD100:  
| | PWR – OFF
- PD100
- L10 (MUX)  
(VTR) MUX/VTR/CC PWR – off, wait 5 sec, on  
√ON/STANDBY LED – green  
If PD100:  
| | PWR – CAMERA  
| If no joy:  
| | Repeat pwrdsn per previous steps  
| | Disconnect,reconnect IEEE 1394 cable  
| | Repeat pwrun per previous steps  
| | If no joy, √MCC
- PD100 If only CHANNEL 3 1394 LED – on, MUX 1394 format error  
| √MCC
- If only CHANNEL 3 BUFF LED – on, MUX FIFO memory buffer error  
√MCC

## **DTV (Continued)**

### **MALS (Continued)**

#### **12.5 VIP PWR LED OFF**

MA73C            √cb AC2 PL 3Φ – cl  
  
L10 (VIP)        √PWR – on  
                    Notify MCC before proceeding  
                    Pull VIP from container to check fuses  
                    √F1 5 Amp Fuse (spare in DTV Fuse Kit)  
                    √F2 2 Amp Fuse (spare in DTV Fuse Kit)  
  
                    If no joy, √MCC

#### **12.6 VIP DATA FLOW LED OFF**

MA73C            √cb AC2 PL 3Φ – cl  
  
L10 (VIP)  
A7                √PWR – on  
                    √Video signal routed to VID OUT DTV pb  
                    √Video signal has Vertical Interval data (PLB Camrs)  
  
L10 (VTR)  
  
(VIP)            DISPLAY SELECT – AUDIO  
                    √CHANNEL 2 AUDIO LEVEL METER indicates signal  
                    If signal indicated, LED failed  
                    Notify MCC, continue Nom Ops  
                    DISPLAY SELECT – DATA  
                    PWR – off, then on (√DATA FLOW LED flashes twice)  
                    If LED does not flash twice, √MCC

## **DTV (Continued)**

### **MALS (Continued)**

#### **12.7 VTR ON/STANDBY RED LED OFF**

R1 √PL AUX – ON

L10 (MUX) √VTR/CC(MUX/VTR/CC) PWR – on (LEDs on)  
Reset internal fuse by:  
VTR/CC(MUX/VTR/CC) PWR – off, wait 30 sec, on  
  
If no joy, √MCC

#### **12.8 VTR STARTS RECORDING OR REWINDS AND STARTS PLAYING AFTER MUX PWR APPLIED**

Timer sw out of config

L10 (VTR) √TIMER – OFF  
  
If no joy, √MCC

#### **12.9 VTR TAPE CONTROLS NOT FUNCTIONING (VTR DISPLAY INDICATES “ERR”)**

Key Inhibit sw appears to be on  
  
L10 (VTR) √KEY INH – OFF  
  
If no joy, √MCC

#### **12.10 VTR DISPLAYS ERROR MSG 32**

VTR has entered SAFE MODE  
  
L10 (VTR) ON/STANDBY – push (red LED on)  
(MUX) VTR/CC,MUX/VTR/CC PWR – off (LEDs off), wait 10 sec, on (LED on)  
(VTR) √ON/STANDBY LED – green  
√Error msg no longer displayed  
  
If no joy, √MCC

## **DTV (Concluded)**

### **MALS (Concluded)**

#### **12.11 VTR DISPLAYS ERROR MSG 21**

VTR has detected moisture inside

L10 (VTR) Remove tape  
ON/STANDBY – push (red LED on)  
Leave for 1 hr before re-attempting pwr on  
Notify MCC

#### **12.12 VTR AUTOMATICALLY PWRS OFF**

VTR Auto Off feature on

L10 (VTR) DISPLAY SELECT – MENU  
↑(↓) pb – ETC, EXEC pb – push  
↓ pb – AUTO STBY, √Disable  
↓ pb – RETURN, EXEC pb – push  
DISPLAY SELECT – DATA

If no joy, √MCC

## BPSMU

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# BPSMU

## BPSMU

### BPSMU AUDIO ONLY

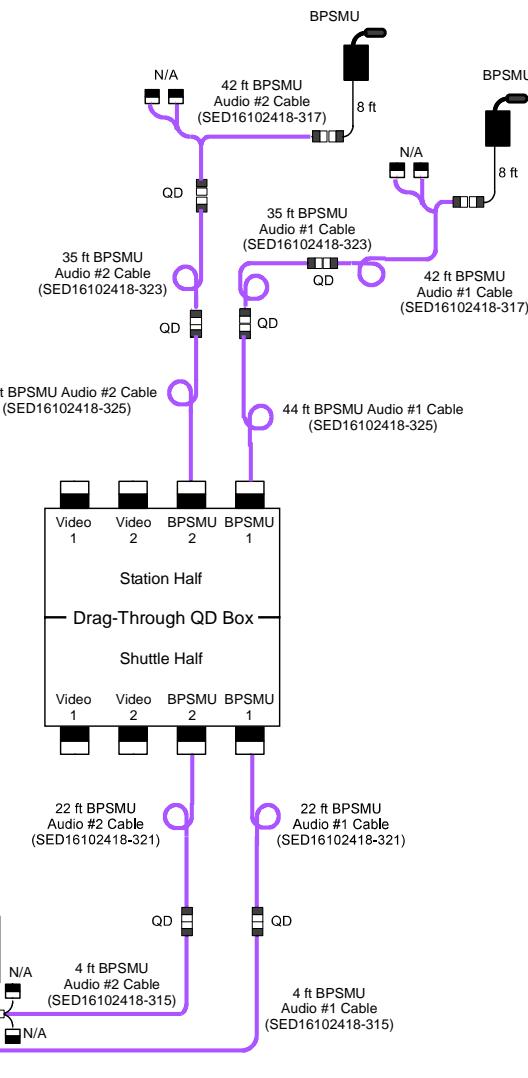
#### 1. Set up BPSMU, Cables

BPSMU  
Replace BPSMU Batt Pack (SED16102434-701)  
in both BPSMU units as reqd  
Discard old BPSMU Batt Packs

Config H/W per dwg at right

#### 2. Config Comm System

AUD PWR – AUD/TONE  
 $\sqrt{MSTR VOL 1(2)} - MAX$   
 A/G 2, ICOM B – T/R (or loop as desired)  
 XMIT/ICOM MODE sel – PTT/PTT  
 VOL A/G 2, ICOM B tw – 8  
 Other Loops – OFF



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## BPSMU (Continued)

### BPSMU AUDIO/VIDEO

#### 1. Set up BPSMU, Safe ODS TV Port

BPSMU Replace BPSMU Batt Pack (SED16102434-701)  
in both BPSMU units as reqd

L12 (SSP 2) Discard old BPSMU Batt Packs  
C/L CAM PWR – OFF

Config H/W per dwg at right

#### 2. Set up PD100

Install Sony Headset

Install Batt

✓Wide Conversion Lens installed

PWR – CAMERA

Tape – Install

✓Viewfinder (LCD) displays STBY

Display pb – Toggle to display tape counter

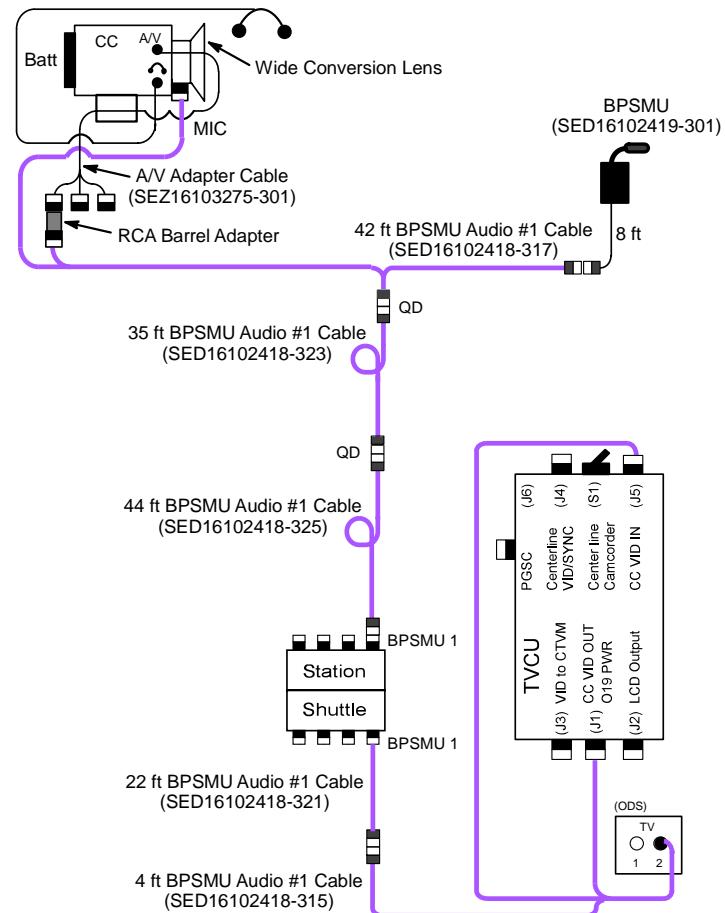
Camr Settings

✓AUTO LOCK – AUTO LOCK

✓FOCUS – AUTO

#### 3. Config TVCU

TCU CENTERLINE/CAMCORDER sw – CAMCORDER



jsc48037\_117\_021.cvx

## BPSMU (Continued)

### BPSMU AUDIO/VIDEO (Concluded)

#### 4. Config TV System

Config H/W per dwg at right

R12 (VPU) Green Jumper – SEC C/L  
 ✓VPU PWR – ON (LED on)

L12 (SSP2) C/L CAM PWR – SEC ON

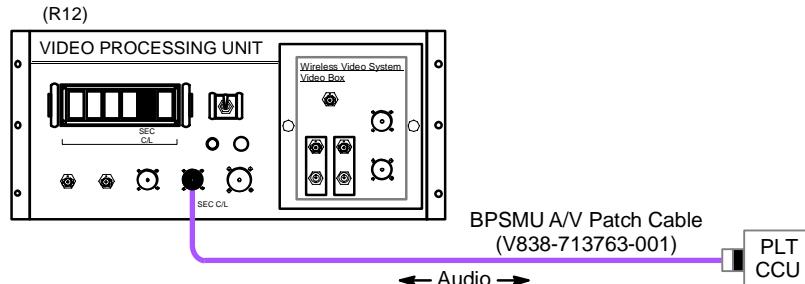
MON 1 PWR – ON (LED on)  
 A7 TV PWR CNTL – PNL  
     CONTR UNIT – MNA(B)  
     CNTL – CMD (wait 10 sec for system initialization)  
 VID OUT MON 1 pb – push  
     IN PL2(VPU) pb – push

MON 1 ✓CC video

#### 5. Config Comm System

CCU AUD PWR – AUD/TONE  
 ✓MSTR VOL 1(2) – MAX  
 A/G 2,ICOM B – T/R (or loop as desired)  
 XMIT/ICOM MODE sel – PTT/PTT  
 VOL A/G 2,ICOM B tw – 8  
 Other Loops – OFF

Perform audio check w/BPSMU



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## BPSMU (Continued)

### BPSMU SPECIFICATIONS

#### BPSMU

INTEGRAL CABLE LENGTH: 8 ft

RECOMMENDED MIC POSITION: Directly in front of mouth; 6 in. from mouth

BATT: Two 9V (pwrs mic, not speaker; launched disconnected)

BATT: 18V

BATT LIFETIME: ~7-10 days

BPSMU WEIGHT: 1.12 lb (w/batt)

#### BPSMU CABLES – DIRECT CCU CONNECTIONS

BPSMU TO CCU ADAPTER (1 ft): Adapts BPSMU integral cable to CCU

BPSMU/ODS ADAPTER (4 in): Adapts 4 ft A/V Cable to CCU

A/V CABLES (4 ft, 42 ft): Minimum A/V Cable config for audio ops

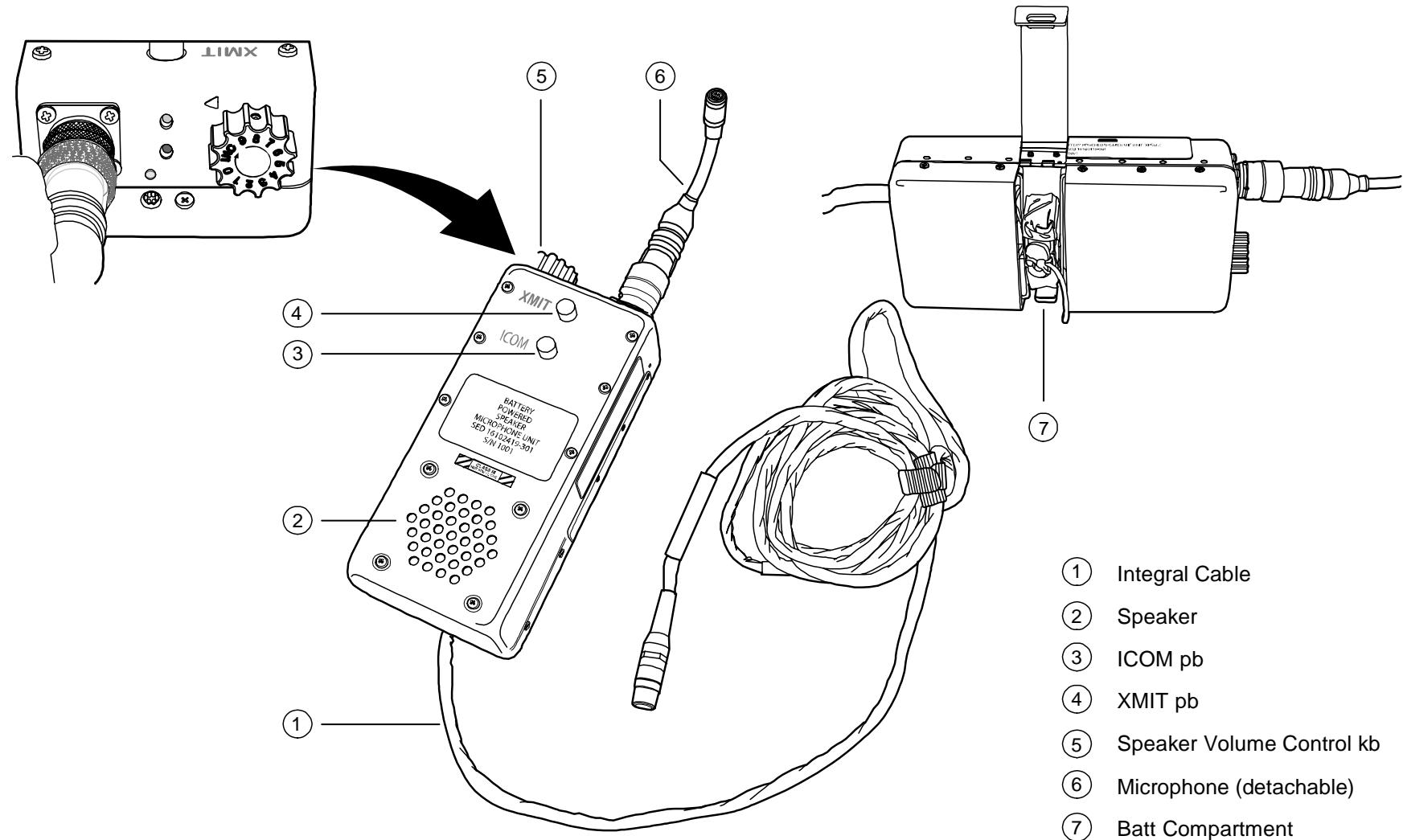
#### BPSMU CABLES – TV CONNECTIONS

A/V CABLES (4 ft, 22 ft, 44 ft, 35 ft, 42 ft) w/TVCU: Config for Camcorder thru ODS TV 1(2) port (TVCU assumes 125 ft of cable)

BPSMU A/V PATCH CABLE (10 ft): Patches ODS TV Port audio into CCU using PRI(SEC) C/L port on VPU

## BPSMU (Continued)

### BPSMU NOMENCLATURE



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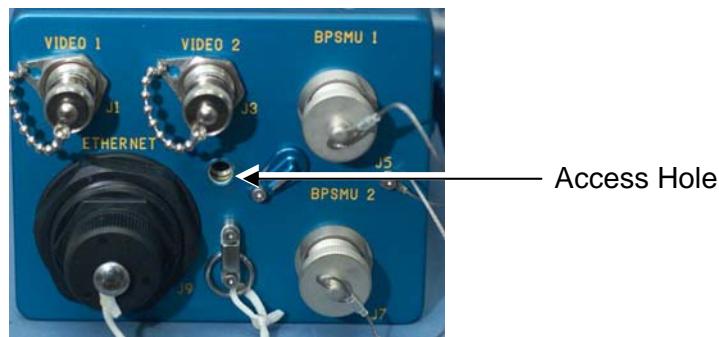
## BPSMU (Continued)

### DRAG THROUGH QD MATING

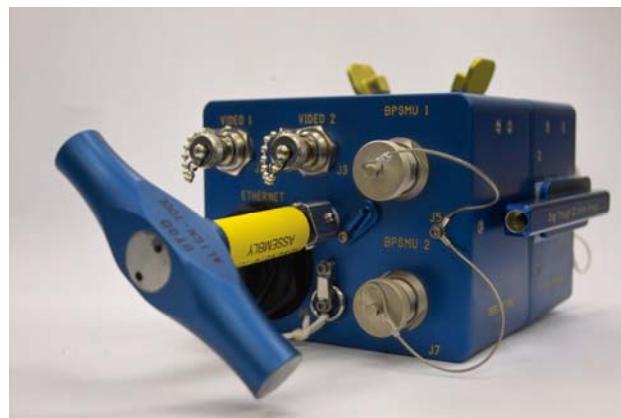
#### NOTE

If activation of quick disconnect feature of the Drag Through QD reqd, both halves (station and orbiter) are to be mated using Alignment Tool

1. Disconnect cables from orbiter half of Drag Through QD. Disconnect cables from Station half as reqd
2. Inspect connectors, mating surfaces for debris or bent pins
3. Open access hole (rotate cw)



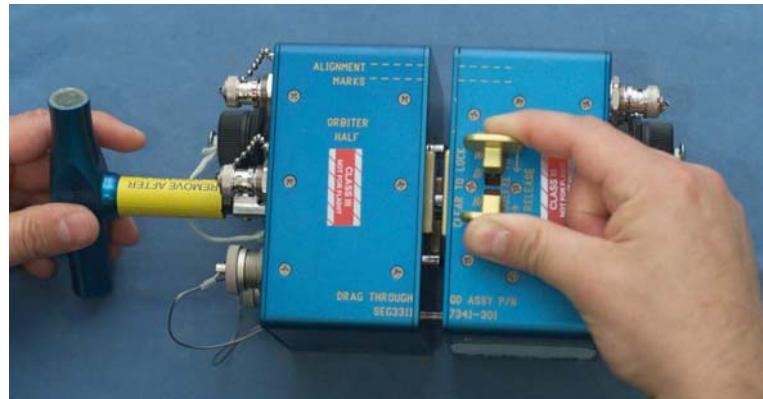
4. Remove Alignment Tool from Drag Through QD Handle Stowage (unthread ccw)
5. Place two Drag Through QD halves together, but not mated, and insert Alignment Tool into access hole



## BPSMU (Continued)

### DRAG THROUGH QD MATING (Continued)

6. Squeeze quick release levers together, rotate Alignment Tool cw (pressure may be needed to engage Alignment Tool threads on station half) until Alignment Tool reaches a soft stop



7. Release quick release levers, verify quick release levers in normal spread posn



8. Remove Alignment Tool (turn ccw)
9. Stow Alignment Tool in Drag Through QD Handle Stowage (turn cw)

## BPSMU (Continued)

### DRAG THROUGH QD MATING (Concluded)

10. Replace Alignment Tool on station half of Drag Through QD.

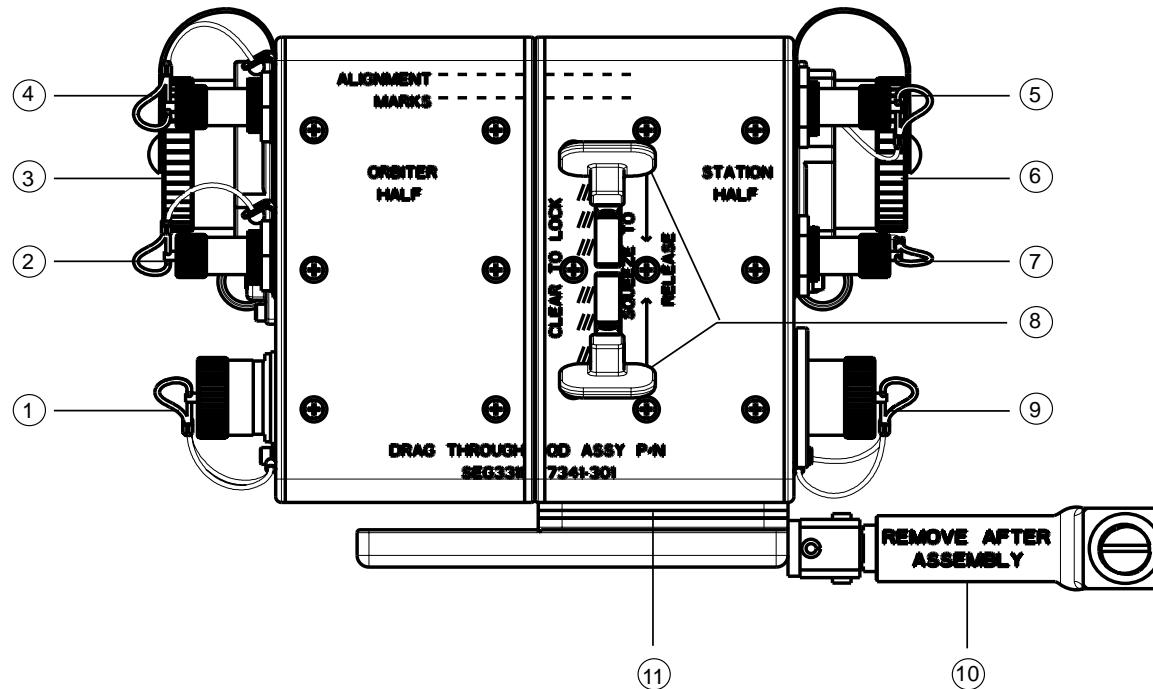


### DRAG THROUGH QD DEACTIVATION

1. Disconnect RWS cables (two) from Orbiter Half Video 1,2 ports. Stow on stbd ditch wall
2. Disconnect BPSMU cables (two) from ODS CCU ports 1,2 (coil reqd)
3. Transfer Drag Through QD, BPSMUs, and remaining attached cables to ISS

## BPSMU (Continued)

### DRAG THROUGH QD NOMENCLATURE

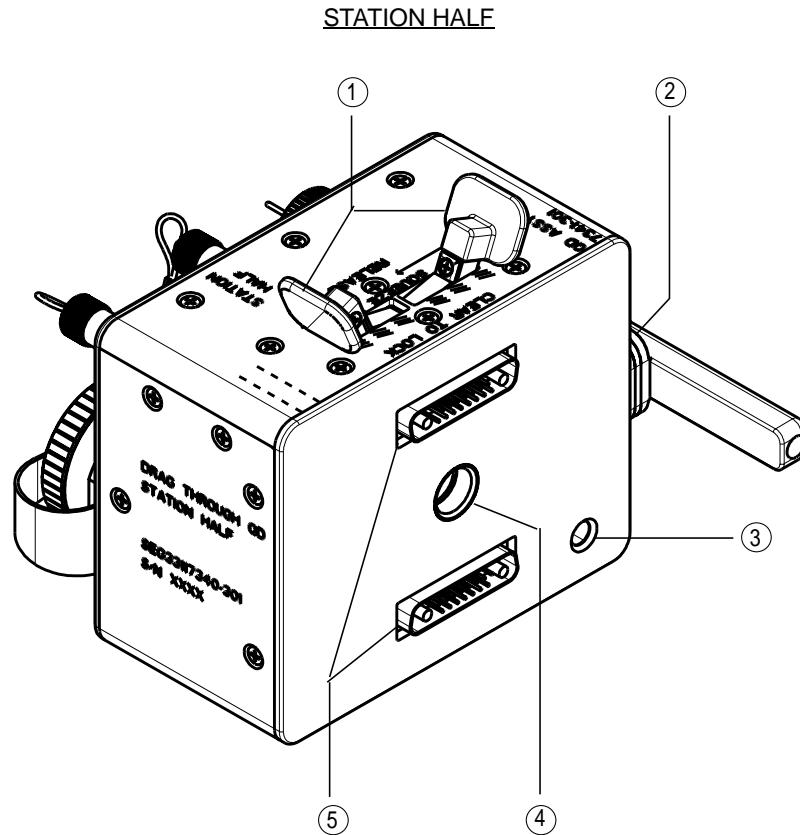


- |   |   |
|---|---|
| (1) BPSMU #1 (J5), BPSMU #2 (J7) directly below | (7) Video #2 (J4)                               |
| (2) Video #2 (J3)                               | (8) Quick Release Lever                         |
| (3) Ethernet (J9)                               | (9) BPSMU #1 (J6), BPSMU #2 (J8) directly below |
| (4) Video #1 (J1)                               | (10) Alignment Tool                             |
| (5) Video #1 (J2)                               | (11) Alignment Tool Holder                      |
| (6) Ethernet (J10)                              |   |

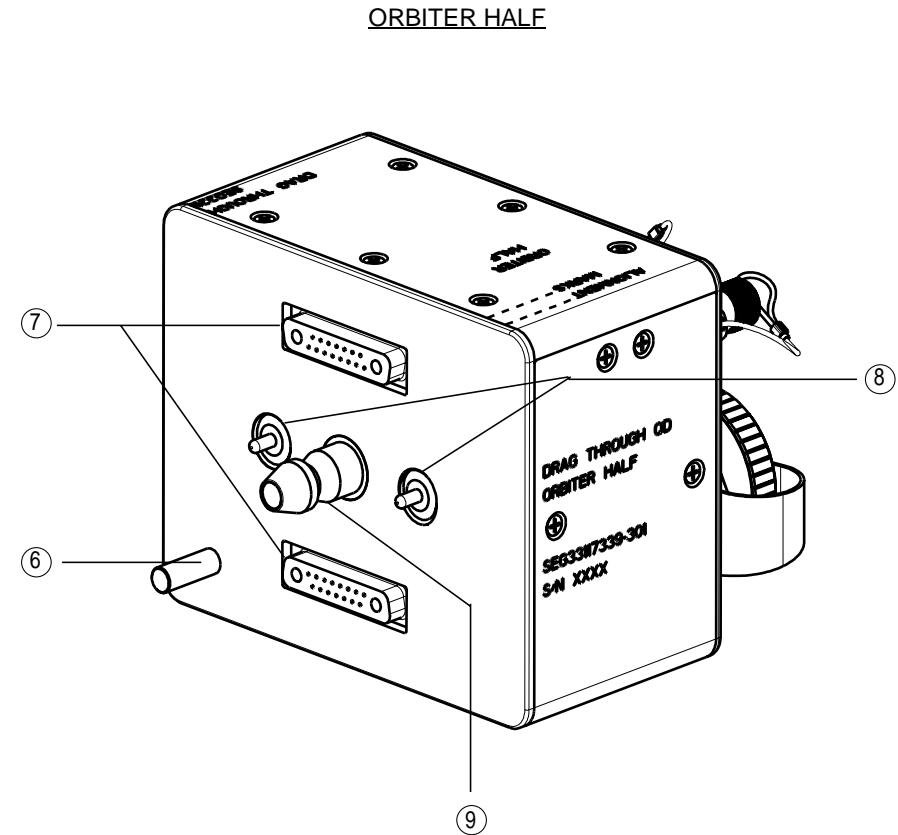
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## BPSMU (Continued)

### DRAG THROUGH QD NOMENCLATURE (Continued)



- ① Quick Release Lever
- ② Alignment Tool Holder
- ③ Alignment Pin Receptacle
- ④ Center Locking Pin Receptacle
- ⑤ DB25 Male Connector

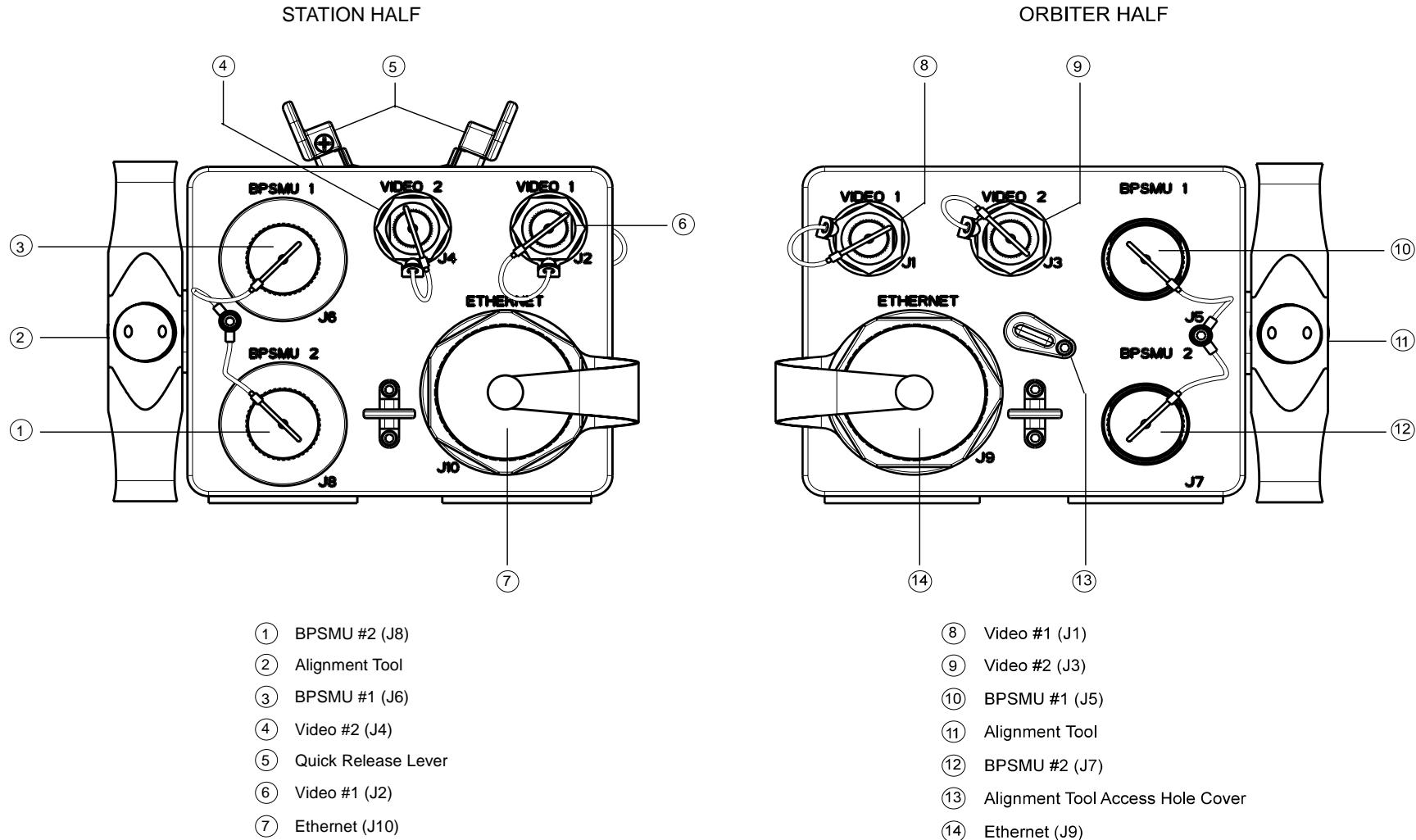


- ⑥ Alignment Pin
- ⑦ DB25 Female Connector
- ⑧ Ball Plunger
- ⑨ Center Locking Pin

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## BPSMU (Concluded)

### DRAG THROUGH QD NOMENCLATURE (Concluded)



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## MINI-CAM

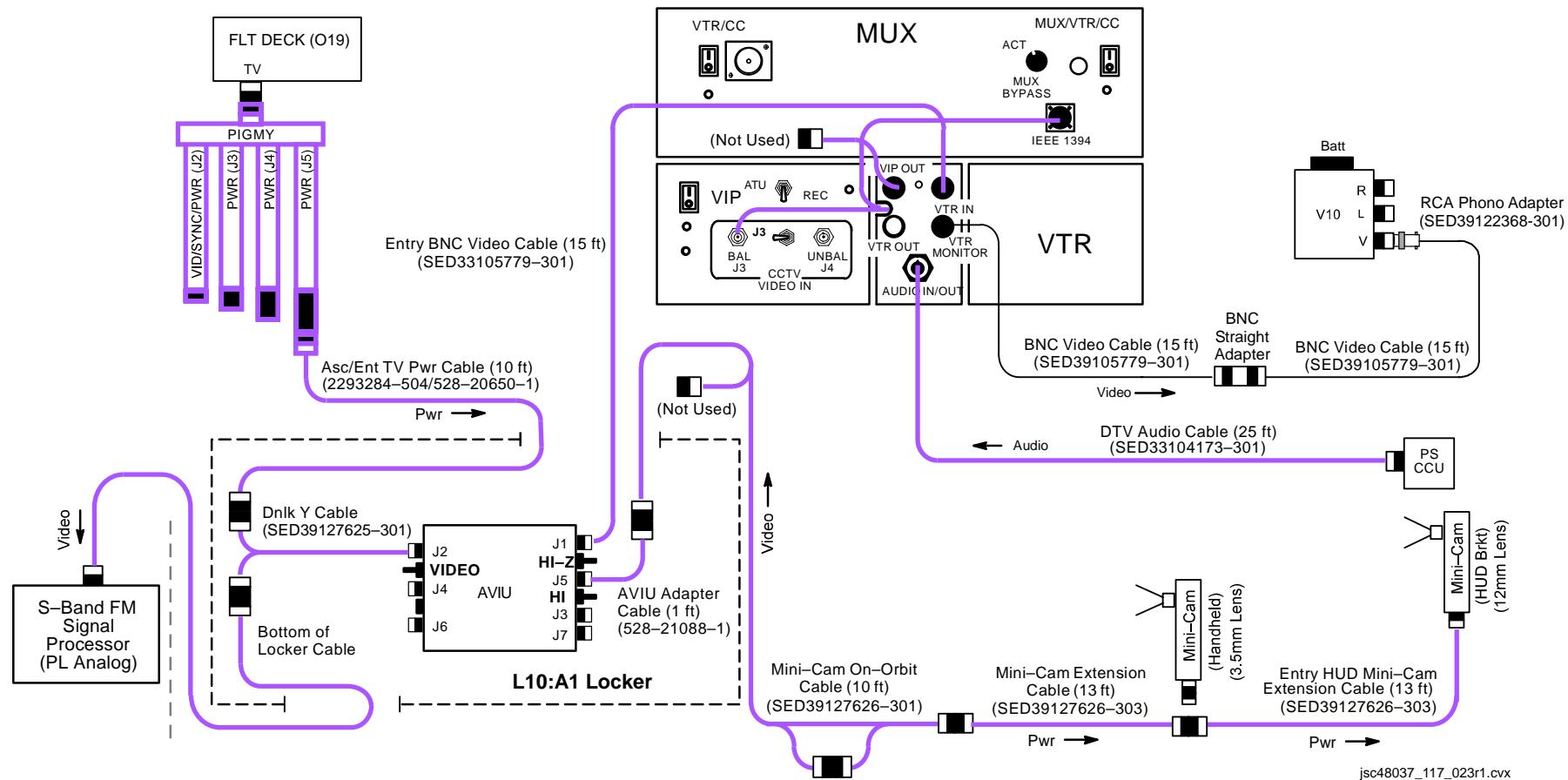
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# MINI-CAM

## MINI-CAM

### ENTRY VIDEO SETUP



## **MINI-CAM (Continued)**

### **ENTRY VIDEO SETUP (Continued)**

1. Config Mini-Cam,VTR for Audio,Video Recording  
Config H/W per dwg, 14-2

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
12mm Lens	Focus – ∞ Aperture – f/5.6  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)
3.5mm Lens	Aperture – f/1.8
L10:A1	<u>AVIU</u> SYNC/VIDEO – VIDEO HI-Z/75 – HI-Z PWR SELECT – HI
O19	√TV PWR – ON
PS ATU	Config audio as reqd for entry audio
L10 (MUX) (VTR)	VTR/CC PWR – on (LED on) √ON/STANDBY LED – green
V10	Install fresh batt PWR – ON

## MINI-CAM (Continued)

### ENTRY VIDEO SETUP (Concluded)

✓12mm Lens/Mini-Cam producing good video

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

V10 PWR – OFF

L10 (VTR)  
(MUX) ON/STANDBY LED pb – push (red LED on)  
VTR/CC PWR – off (LED off)

O19 TV PWR – OFF

#### NOTE

TV,VTR pwr will be re-enabled per ENT AFT FLT DECK  
CONFIG 15 (DEORB, NOMINAL DEORBIT PREP); recording  
will be initiated 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:

Focus – Adjust per V10  
Aperture – Adjust per V10  
If needed, turn down brightness on HUD display

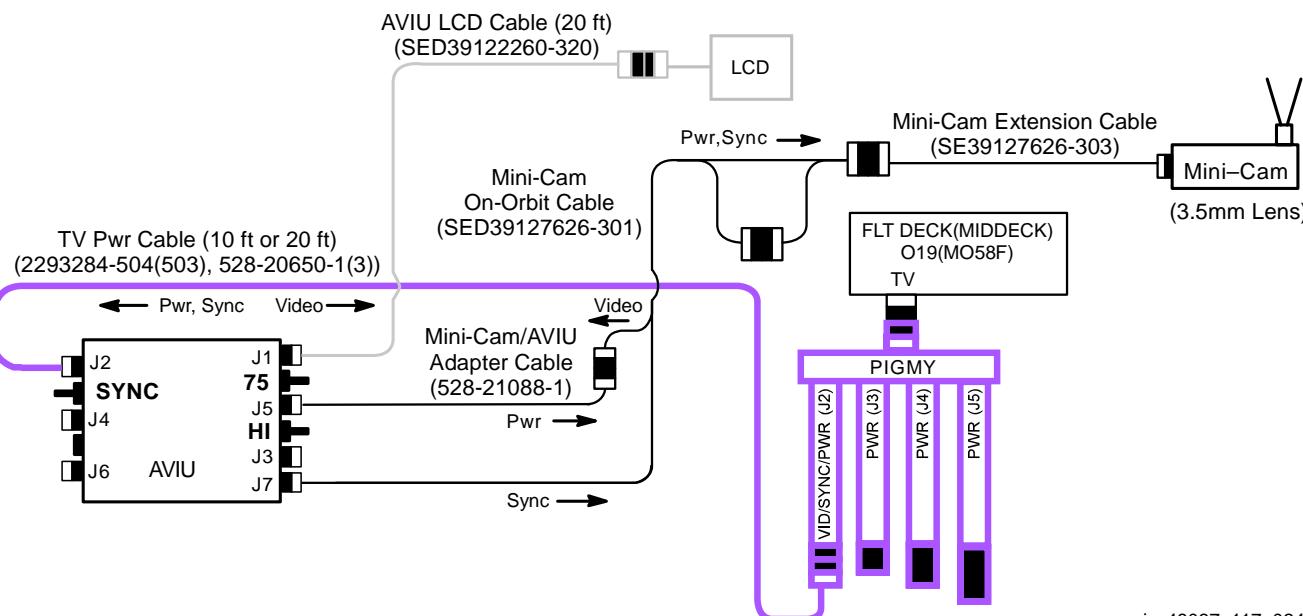
Turn off V10 when not needed

## MINI-CAM (Continued)

### IN-CABIN MINI-CAM

Config H/W per dwg below

AVIU	SYNC/VIDEO – SYNC HI-Z/75 – 75 PWR SELECT – HI
O19(MO58F)	✓TV PWR – ON
LCD	Pwr – ON (as reqd)
Mini-Cam	Lens – 3.5mm Aperture – Adjust per LCD



## **MINI-CAM (Continued)**

### **SPECIFICATIONS**

CAMR DIMENSIONS: 5 1/4 in (L) X 1 in (W) X 1 3/16in (D)

WEIGHT: 0.40 lb

IMAGER MODEL: XC-999

HORIZONTAL RESOLUTION: 470 lines

PIXEL COUNT: 768 Horizontal, 494 Vertical

SENSING AREA: 6.4mm Horizontal, 4.8mm Vertical, 8.0mm Diagonal

AVIUVOLTAGE: 12V

WEIGHT: 1.6 lb

### **LENS DATA**

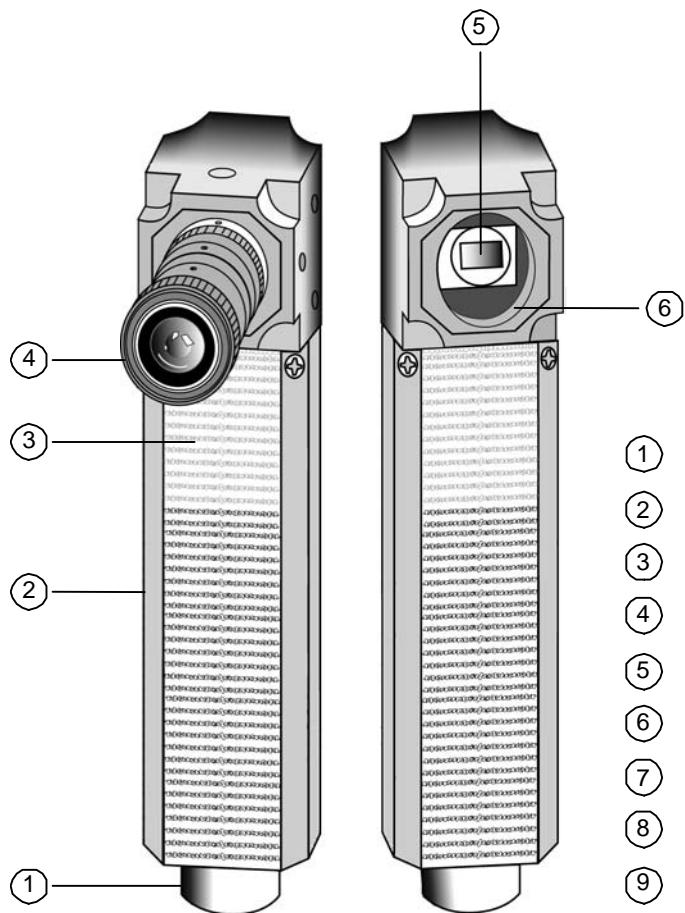
Lens	Aperture Range (f/stop)	Approximate Horizontal Field of View (FOV)	Minimum Focus Distance	Weight (lb)	Configuration Used
3.5mm	f/1.8-f/16	84.87°	Fixed	0.10	Glareshield, Aft Window
6.0mm	f/1.4-f/16	56.15°	0.3m	0.10	Aft Window
12.0mm	f/1.4-f/16	29.86°	0.5m	0.10	HUD
23.0mm	f/1.4-f/22	15.8°	0.2m	0.31	

### **BRACKET DATA**

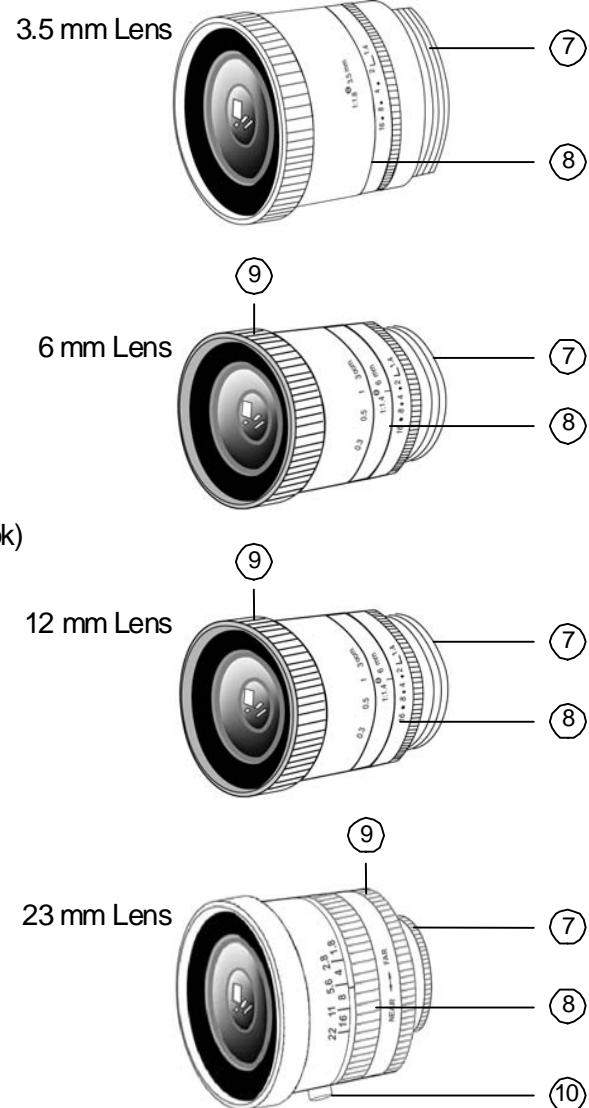
Bracket	Dimensions		Mount Type
	Length	Width	
Glareshield	9.5 in - 10.5 in	2 in	Velcro w/FDF Tether
Rear Window	12 in - 20 in	2 in	Velcro w/FDF Tether
HUD	4.5-in base 1.5-in extension 2-in rise	N/A	Thumbscrew w/Tie Wrap

## MINI-CAM (Concluded)

### NOMENCLATURE



- ① Pwr/Video Connector
- ② Body (covered in Black Velcro hook)
- ③ Yellow Velcro (HUD Brkt)
- ④ Lens
- ⑤ CCD
- ⑥ Lens Mount
- ⑦ Threaded Mount
- ⑧ Aperture Ring
- ⑨ Focus Ring
- ⑩ Aperture Lock Nut



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## WIRELESS VIDEO SYSTEM (WVS)

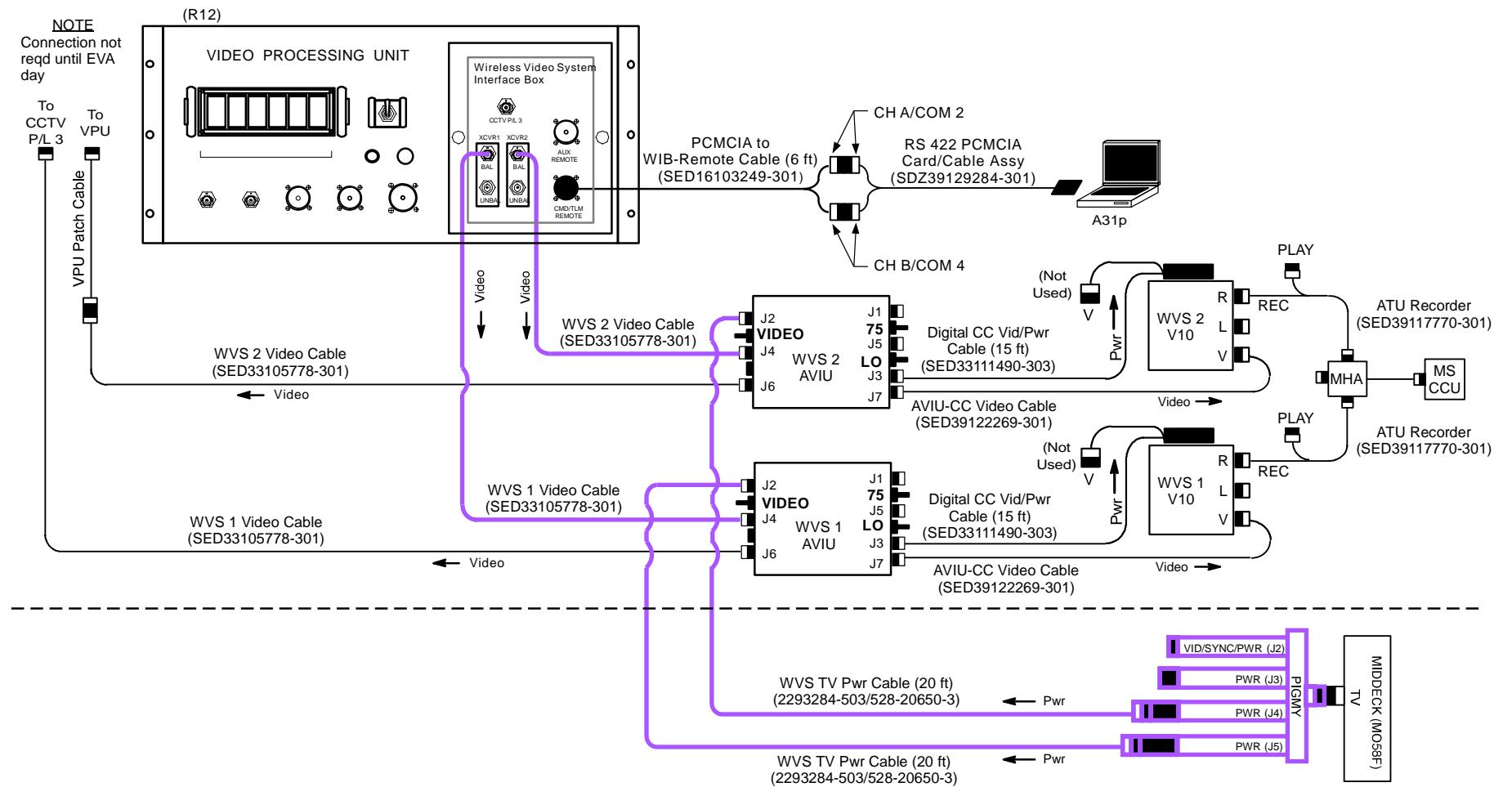
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## WIRELESS VIDEO SYSTEM (WVS)

### WVS INITIAL SETUP w/o ERCAs

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



## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/o ERCAs (Continued)

2. WVS System
- A7            WIRELESS VID HTR – ON  
                PWR – ON
3. Photo/TV H/W Preparations
  - AVIUs Powering V10s (two)
    - SYNC/VIDEO – VIDEO
    - HI-Z/75 – 75
    - PWR SELECT – LO
  - V10 (two)
    - ✓TV PWR – ON
    - PWR – ON
    - ✓Tape installed
    - ✓WVS Test Pattern displayed (color bars w/"No WVS Video")
    - PWR – OFF
- MO58F        |  
V10            |  
  
A11            |  
R10            |  
  
4. WVS PGSC Prep
- MO63P        |  
PGSC           |  
  
PGSC Pwrup and Application Opening
  - ✓DC UTIL PWR MNC – ON
  - Pwr – ON
  - Sel Shuttle Apps icon
  - Sel WVS icon
  - Sel 'No' at 'Restore To Previous Settings:' window
  - If 'Camera Port Configuration' error displayed:
    - Remove Quatech RS-422 Card
    - Sel 'Start' > 'Shut Down' > 'Shut Down' > 'OK'
    - Reinstall Quatech RS-422 Card
    - Pwr – ON
    - Sel Shuttle Apps icon
    - Sel WVS icon
  - RF Camera page will appear

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/o ERCAs (Concluded)

#### 4. WVS PGSC Prep (Concluded)

##### Application Setup

If 'Static XCVR'('Bad Camera ID','Temp Alert','Temp Caution') alert msg:

| Perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)

If 'Static RF Camera' alert msg:

Disregard

Sel File → 'Assign Camera ID'

Verify following:

Camr Address	S/N	In Use	Label
16	1010	1	EV1
17	1011	1	EV2

When complete, sel 'OK'

If Camr IDs not correct:

Sel 'Delete Entry' until all deleted

Perform CAMR ID ASSIGNMENT (Cue Card, WVS) as reqd

Sel File → Advanced Controls

On XVCR tab:

✓Chroma Stabilizer – selected

✓IF – selected

✓Other options not selected

Sel RF Camera tab:

✓Power Selections – selected

✓Automatic Gain Control – selected

✓S-Band Level – selected

✓Other options not selected

When complete, sel 'OK'

#### 5. PWRDN

Sel File → Exit

WIRELESS VID PWR – OFF

HTR – OFF

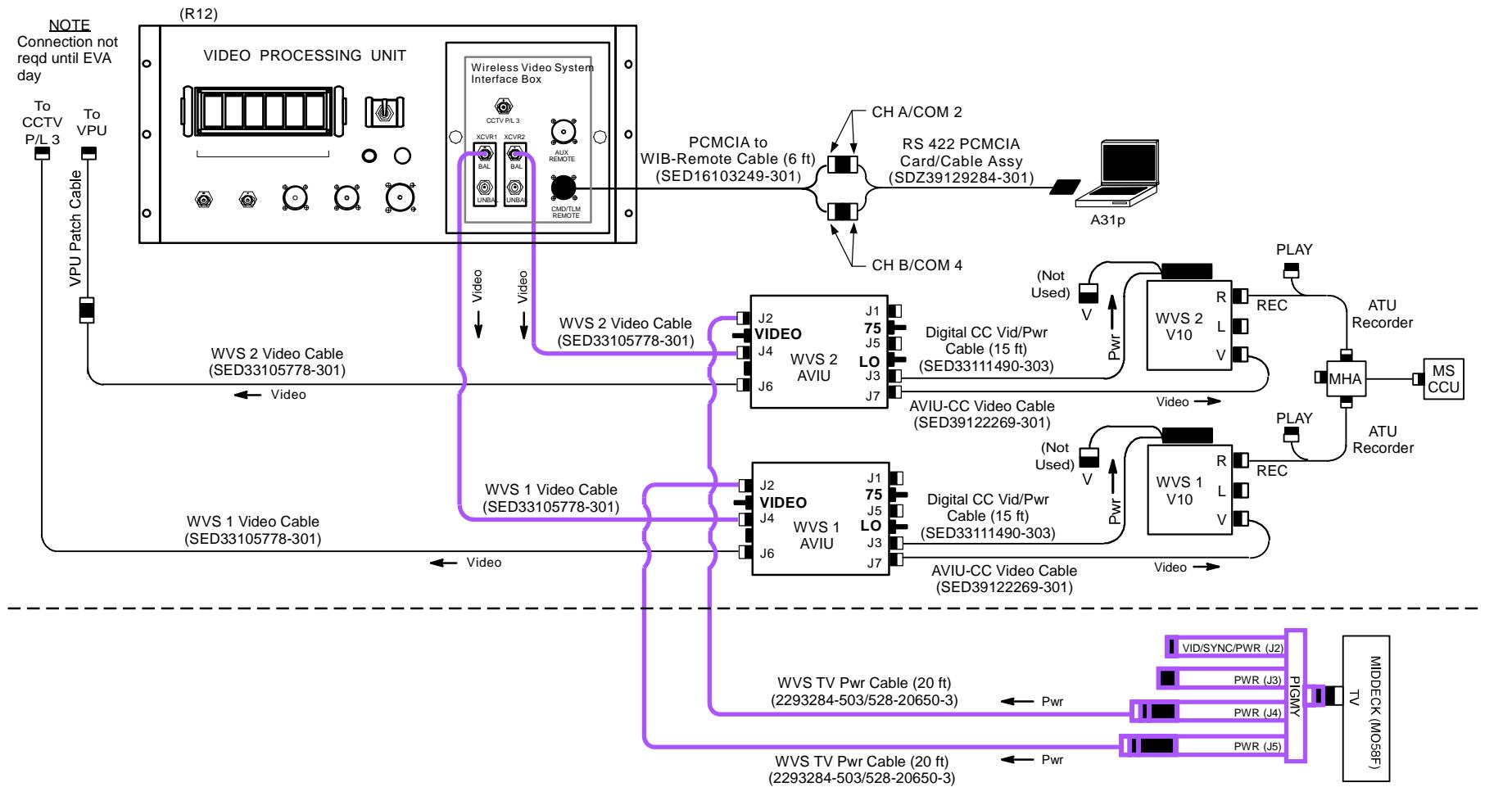
Go to DEACTIVATION (Cue Card, TV) as reqd

A7

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/ERCAs

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



## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/ERCAs (Continued)

2. WVS System
- A7            WIRELESS VID HTR – ON  
              PWR – ON
3. Photo/TV H/W Preparations
  - AVIUs Powering V10s (two)
    - SYNC/VIDEO – VIDEO
    - HI-Z/75 – 75
    - PWR SELECT – LO
  - V10 (two)
    - ✓TV PWR – ON
    - PWR – ON
    - DISPLAY pb – press to display tape counter
    - ✓Tape installed
    - ✓WVS Test Pattern displayed (color bars w/"No WVS Video")
- A11            Audio
  - ✓CCU PWR – ON
  - ✓MS AUD PWR – AUD/TONE
  - ✓A/G 1 – T/R
  - ✓ICOM A – T/R
- R10
4. WVS PGSC Prep
  - PGSC Pwrup and Application Opening
    - ✓DC UTIL PWR MNC – ON
    - Pwr – ON
    - Sel Shuttle Apps icon
    - Sel WVS icon
  - Sel 'No' at 'Restore To Previous Settings:' window
  - If 'Camera Port Configuration' error displayed:
    - Remove Quatech RS-422 Card
    - Sel 'Start' > 'Shut Down' > 'Shut Down' > 'OK'
    - Reinstall Quatech RS-422 Card
    - Pwr – ON
    - Sel Shuttle Apps icon
    - Sel WVS icon
  - RF Camera page will appear
- MO63P            PGSC

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/ERCAs (Continued)

#### 4. WVS PGSC Prep (Concluded)

##### 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 XVC tab:

✓Chroma Stabilizer – selected

✓IF – selected

✓Other options not selected

Sel RF Camera tab:

✓Power Selections – selected

✓Automatic Gain Control – selected

✓S-Band Level – selected

✓Other options not selected

When complete, sel 'OK'

#### 5. WVS Checkout

##### TV System

Perform ACTIVATION (Cue Card, TV)

##### EMU,Airlock Prep

Lights – ON

✓EMU TV installed on Helmet

REBA sw – ON

EMU TV Pwr pb – press (green LED)

Airlock  
EMU  
PLSS  
EMU

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS INITIAL SETUP w/ERCAs (Concluded)

#### 5. WVS Checkout (Concluded)

##### Video Quality Check

V10  
PGSC      REC pb (two) – press (red LED)  
Select Page – RF Camera  
For C,L,R lens on each RF Camr Assy:  
    Lens Iris Cntl – op(cl)  
    √ Video quality and perform CAMR ADJUSTMENTS (Cue Card, WVS) as desired

##### Video Routing Check

R12 (WIB)  
A7      CCTV PL 3 port – One of two XCVR/AVIU inputs  
MON      VID OUT MON 1(2) pb – push  
R12 (WIB)  
MON      IN PL 3(WVS) pb – push  
MON      √ Video quality  
CCTV PL3 port – Other XCVR/AVIU input  
MON      √ Video quality

#### 6. PWRDN

##### Perform PWRDN (WVS, Cue Card)

EMU      EMU TV Pwr pb – push (no green LED)  
PLSS      REBA sw – OFF  
Airlock      Lights – As reqd

Go to DEACTIVATION (Cue Card, TV) as reqd

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS DAY-OF-EVA CHECK

#### 1. Photo/TV H/W Activation

MO58F      V10 (two)  
V10            √TV PWR – ON  
                PWR – ON  
                DISPLAY pb – press to display tape counter  
                √Tape installed

#### 2. WVS Sys Check

A7            √WIRELESS VID HTR – ON  
                PWR – ON

#### 3. PGSC Pwrup and Application Opening

MO63P      √DC UTIL PWR MNC – ON  
PGSC          Pwr – ON  
                Sel Shuttle Apps icon  
                Sel WVS icon  
  
                Sel 'No' at 'Restore To Previous Settings' window  
  
If 'Camera Port Configuration' error displayed:  
    Remove Quatech RS-422 Card  
    Sel 'Start' > 'Shut Down' > 'Shut Down' > 'OK'  
    Reinstall Quatech RS-422 Card  
    Pwr – ON  
    Sel Shuttle Apps icon  
    Sel WVS icon  
    RF Camera page will appear

NOTE  
During EVA prep, EMU TV assy will be pwrd

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### **WVS DAY-OF-EVA CHECK (Concluded)**

#### 4. Application Setup

Select Page – XCVR

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

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

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)

Select Page – RF CAMERA

Near middle of RF Camera page, sel ‘Advanced Controls’

S-Band Level (two) – Maximum

For center lens on each RF Camr Assy:

Lens Iris Cntl – op(cl) until good video on V10(MON)

## **WIRELESS VIDEO SYSTEM (WVS) (Continued)**

### **SPECIFICATIONS**

#### RF CAMR (aka EVA mobility unit Radio frequency Camr Assembly (ERCA))

MOUNTING INTERFACE: EVA helmet light structure

CAMRS: 3 per helmet

LENS FOCAL LENGTH:

LEFT: 6mm (56° HFOV) (mounted on left helmet light)

CENTER: 3.5mm (85° HFOV)

RIGHT: 12mm (30° HFOV) (mounted on right helmet light)

FOCUS CONTROL: FIXED at HYPERFOCAL

IRIS: MANUAL via PGSC

SHUTTER SPEED: AUTO(MANUAL)

GAIN CONTROL: AUTO(MANUAL) (0 to +6 dB)

WHITE BALANCE: AUTO(PRESET)

IMAGER:

MODEL: Sony XC-999

HORIZONTAL RESOLUTION: 470 lines

PIXEL COUNT: 768 Horizontal, 494 Vertical

SENSING AREA: 6.4mm Horizontal, 4.8mm Vertical, 8.0mm Diagonal

UHF RCVR ANTENNA: 1 (on top of helmet)

S-BAND XMTR ANTENNAS: 2 (on side of helmet light batts)

POWER: 12V from REBA batt enabled by pwr pb on right side of ERCA

OPERATING TEMP: -31 degC to +185 degC

#### PAYLOAD BAY TRANSCEIVERS (XCVR): 2 units

LOCATION: BAY 5 (under PLB liner)

OPS POWER: 28 VDC from A7/WIRELESS VIDEO POWER sw, Control Bus BC1

HTR POWER: 28 VDC from A7/WIRELESS VIDEO HEATER sw, Control Bus BC1

OPERATING TEMP: -190 degC to +210 degC

#### UHF PLB COMMAND ANTENNA: 1 unit

LOCATION: ODS TRUSS – AFT

## **WIRELESS VIDEO SYSTEM (WVS) (Continued)**

### **SPECIFICATIONS (Concluded)**

S-BAND RECEIVE ANTENNAS: Up to 7

LOCATIONS: 2 at BAY 1 PORT, STBD SILL

2 at BAY 4 PORT, STBD SILL

2 at BAY 11 PORT, STBD SILL

1 at AFT BULKHEAD

POWER: 28 VDC from A7/WIRELESS VIDEO HEATER sw, Control Bus BC1

COMMAND LINK: UHF

FREQUENCY: 400 MHz

EFFECTIVE BANDWIDTH: 12kHz

BIT RATE: 9600 bps

TELEMETRY/VIDEO LINK: S-BAND

FREQUENCY: 2410 & 2470 MHz

VIDEO BANDWIDTH: 16 MHz

TELEMETRY BANDWIDTH: 5.8 & 6.8 MHz

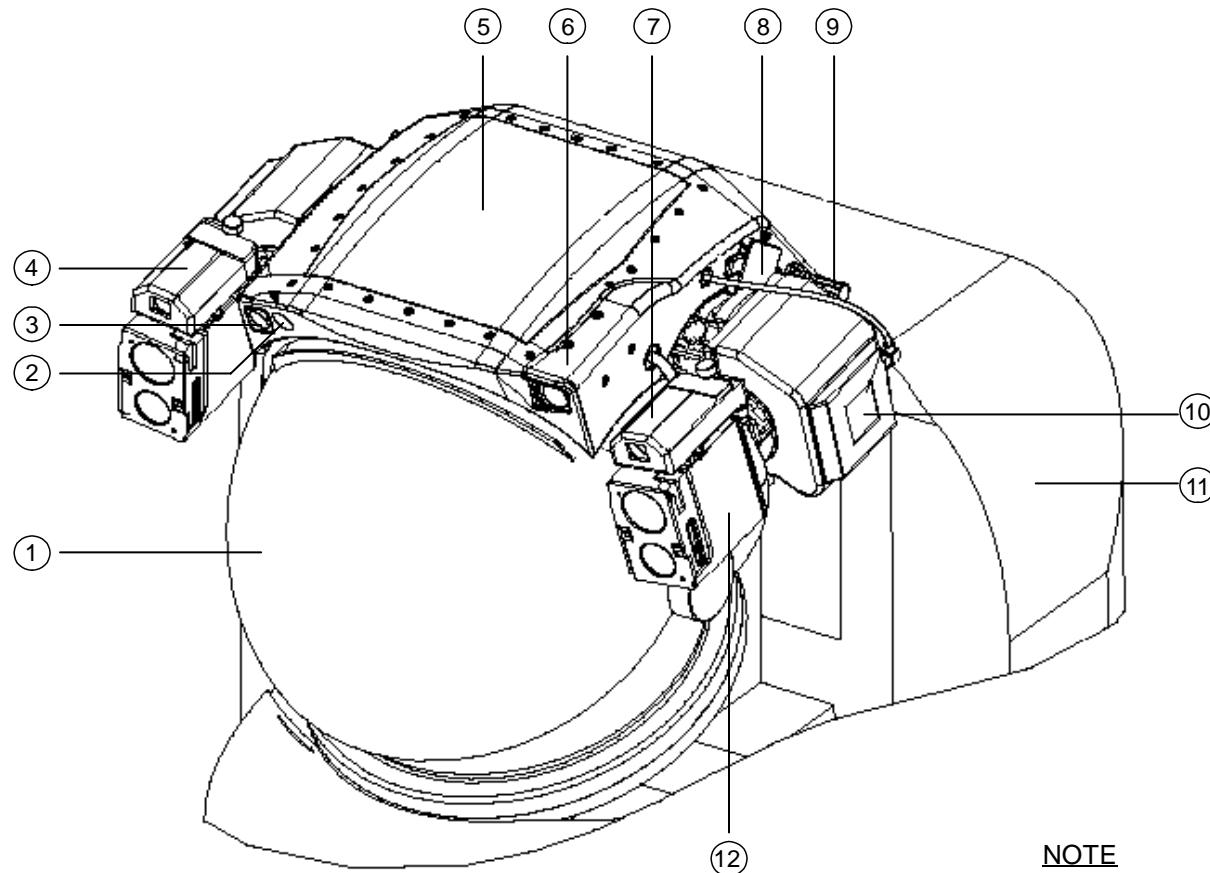
TELEMETRY BIT RATE: 9600 bps per channel

RANGE: 300 ft reqd, 1100 ft expected (direct line-of-sight)

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### NOMENCLATURE

RF CAMR MOUNTED TO EMU HELMET



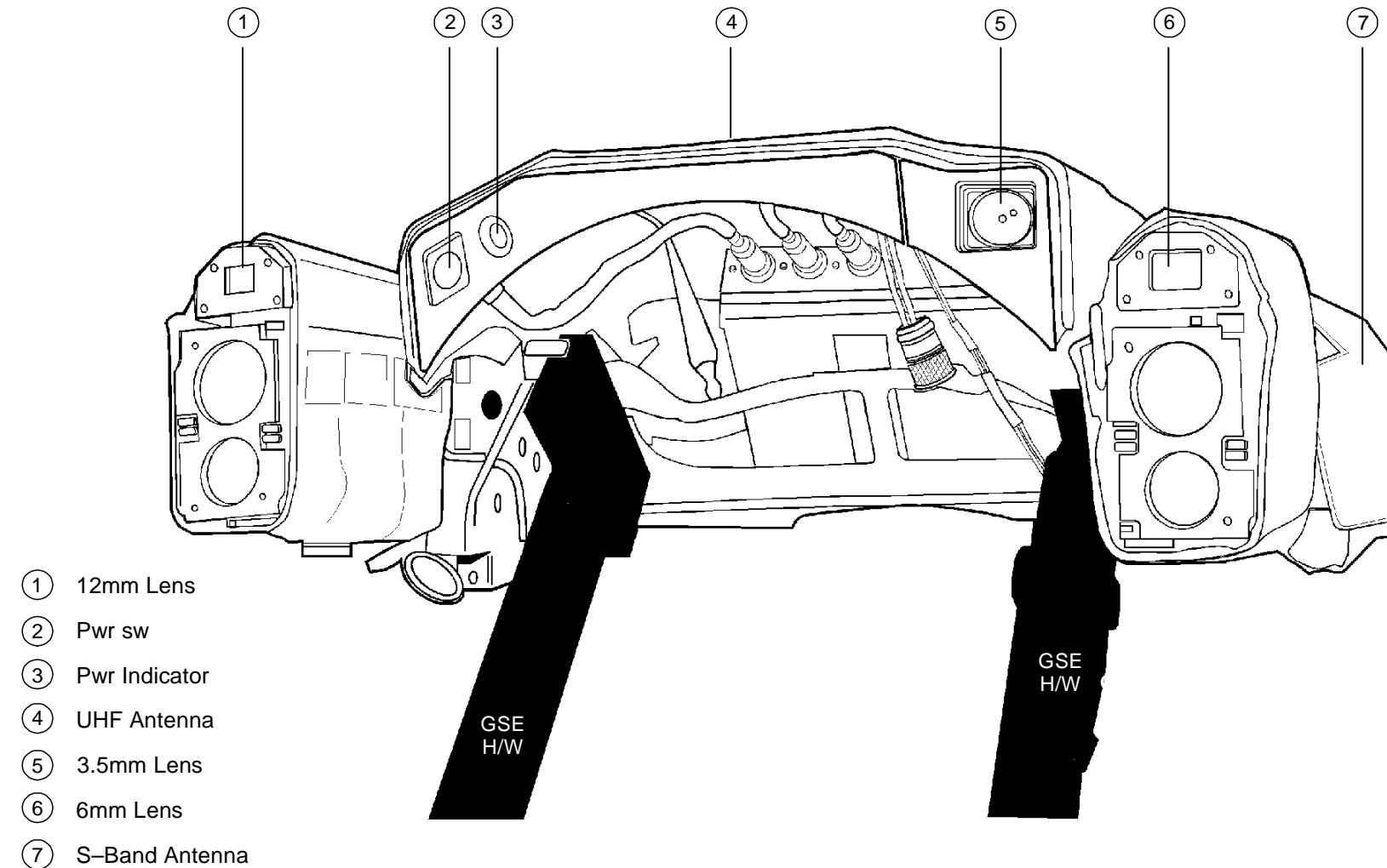
- ① EMU Helmet
- ② Pwr Indicator
- ③ Pwr sw
- ④ 12mm Lens
- ⑤ UHF Antenna
- ⑥ 3.5mm Lens
- ⑦ 6mm Lens
- ⑧ Latch (2X)
- ⑨ Pwr Receptacle
- ⑩ S-Band Antenna (2X)
- ⑪ PLSS
- ⑫ Helmet Light Module (2X)

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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### NOMENCLATURE (Continued)

RF CAMR MOUNTED TO EMU HELMET LIGHT

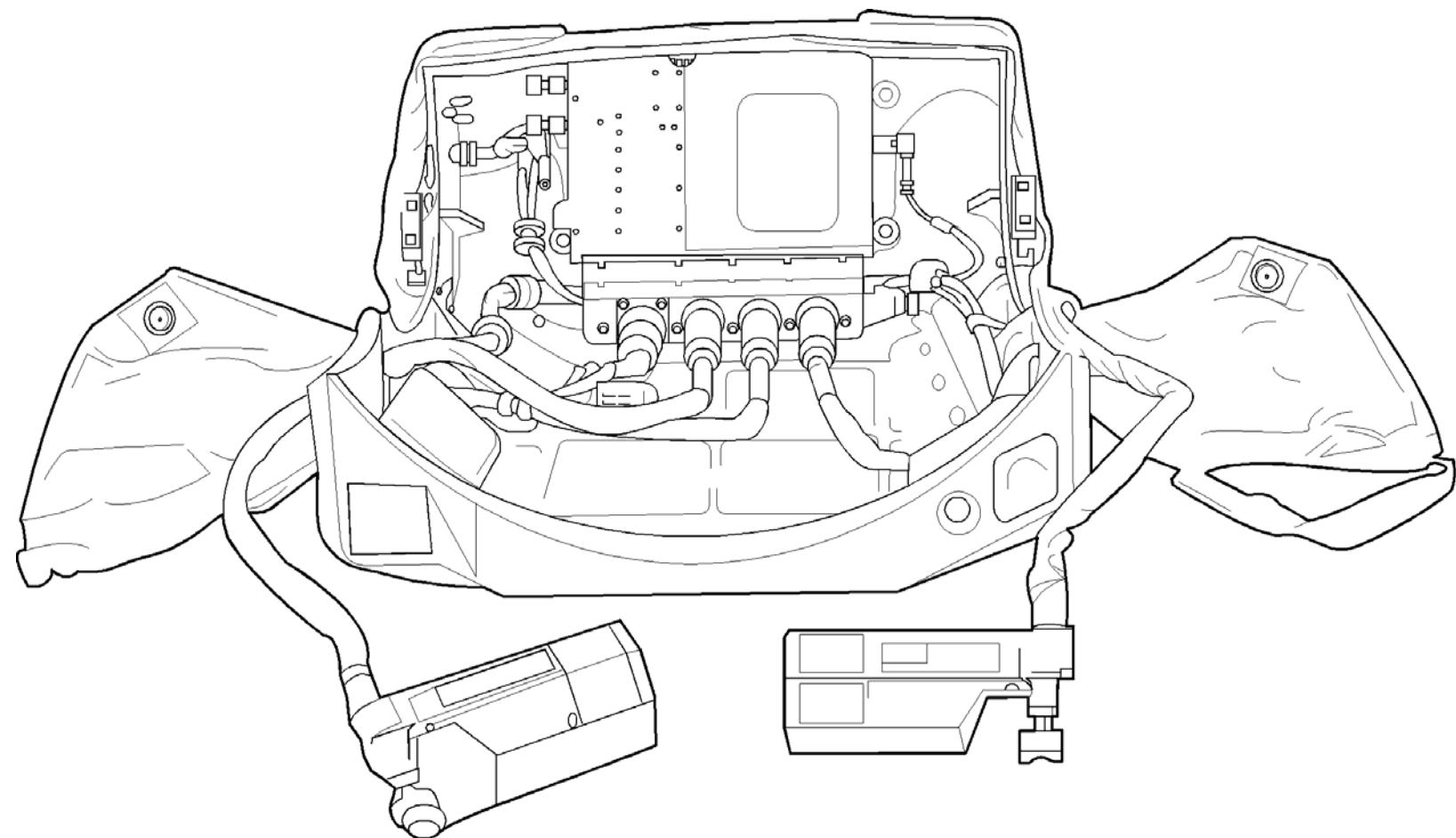


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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### NOMENCLATURE (Concluded)

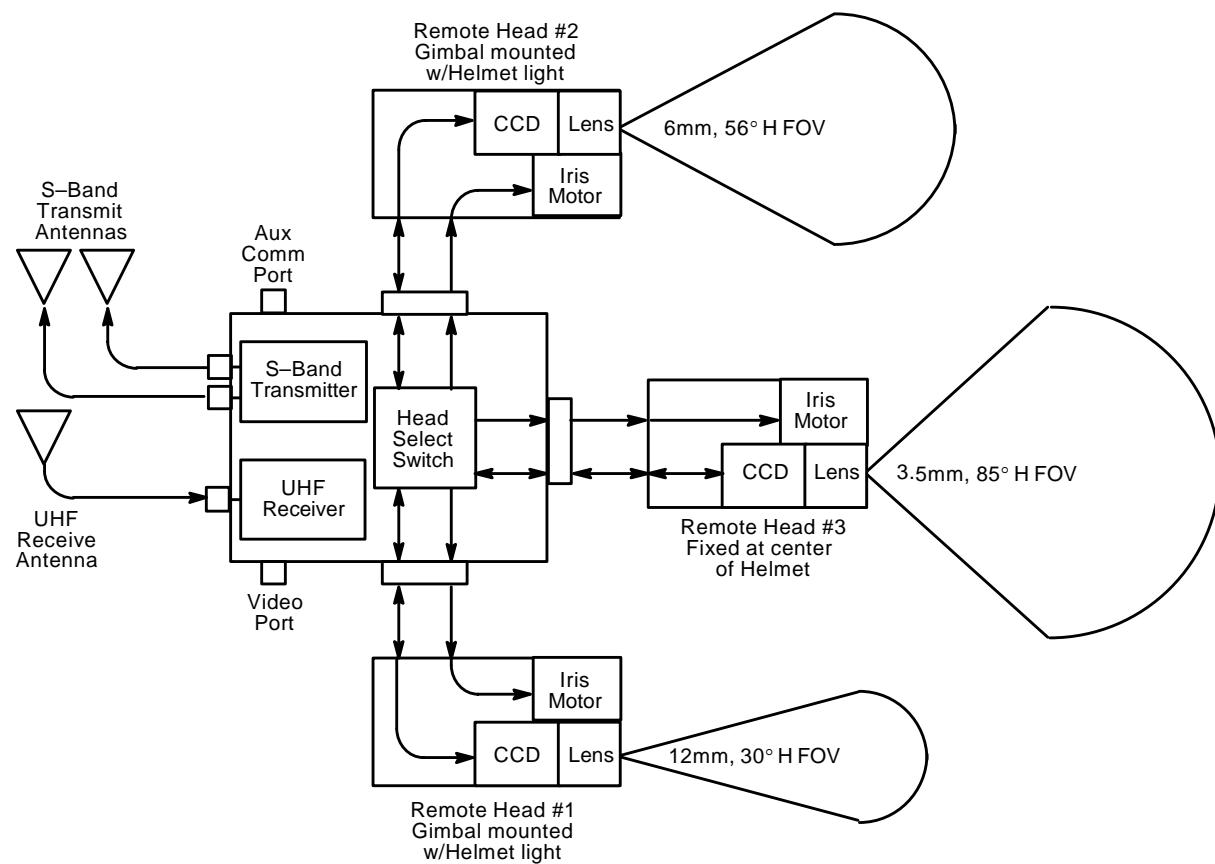
RF CAMR SHELL



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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### RF CAMR ELECTRONICS

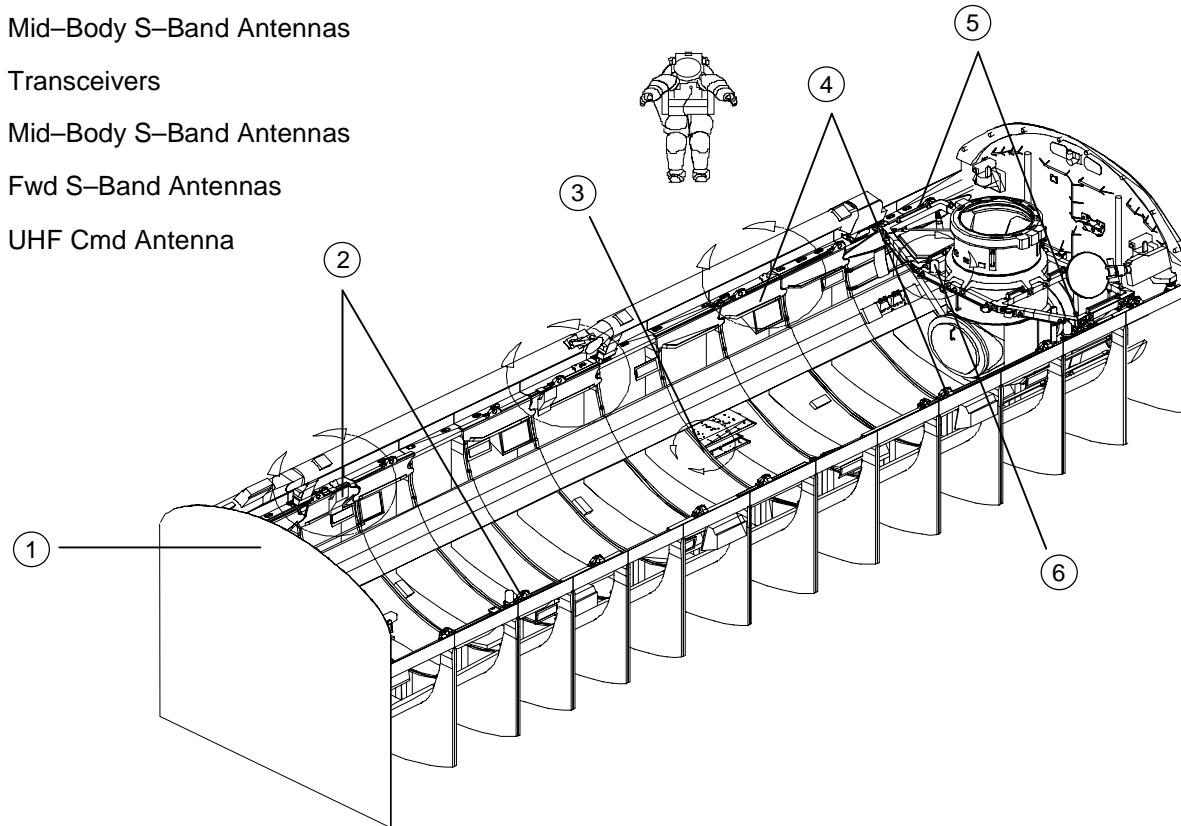


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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### WVS PLB MOUNTED H/W

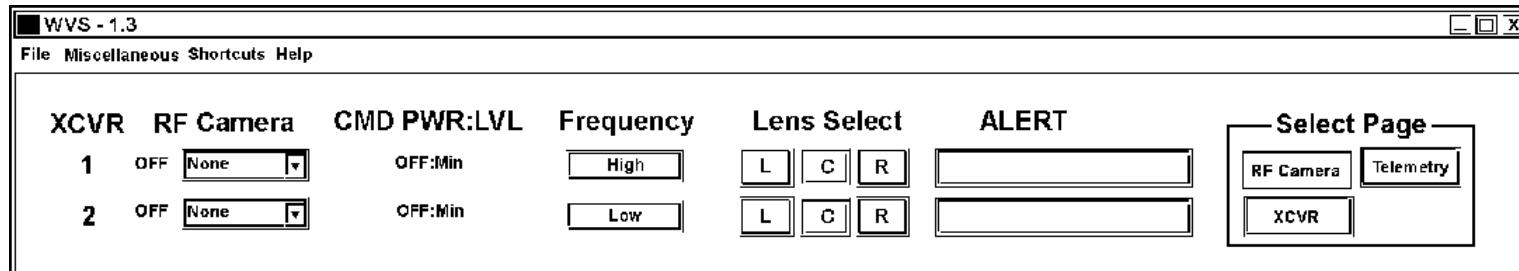
- ① Aft Bulkhead Antenna
- ② Mid-Body S-Band Antennas
- ③ Transceivers
- ④ Mid-Body S-Band Antennas
- ⑤ Fwd S-Band Antennas
- ⑥ UHF Cmd Antenna



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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – TOP STATUS AREA



jsc48037\_080.cnv

RF CAMERA Status  
[ON/green / OFF/black]

RF CAMERA Pulldown

CMD PWR:LVL Status  
[OFF:Min(Max) / ON:Min(Max)]

Frequency Status/Cmd  
[High / Low]

Lens Select Cmd  
[L,C,R]

ALERT Msg Display

RF Camr xmtr pwr status changes to ON when Camr selected (in pulldown menu)

Selects/deselects Camr assignments to each PLB XCVR. RF Camrs will swap assignments if alternate assigned Camr selected

Denotes which PLB XCVR is processing/sending cmds (ON/OFF). Displays cmd level (Min/Max)

Frequency that PLB XCVR is receiving S-Band signal from RF Camr. Will swap Camr assignments.  
Easiest way to swap Camr video coming from WIB connectors, recorders

Selects operational lens. Default is Center

Displays error msgs generated by system. Msgs start off flashing/blue and change to static/black when acknowledged (clicked). "Temp Caution" msg will start off flashing/yellow until acknowledged. Msgs disappear when problem fixed. Highest priority error displayed first. Five available msgs:

Static XCVR

Loss of comm between PGSC,PLB XCVR

Static RF Camera

Loss of comm between XCVR,RF Camr

Bad Camera ID

Mismatch between RF Camr selected and RF Camr transmitting ID

Temp Alert

Displays when RF Camr(PLB XCVR) temp is 5° from going into caution range (ERCA = -35° to -30° C or +80° to +85° C, XCVR = -40° to -35° C or +80° to +85° C)

Temp Caution

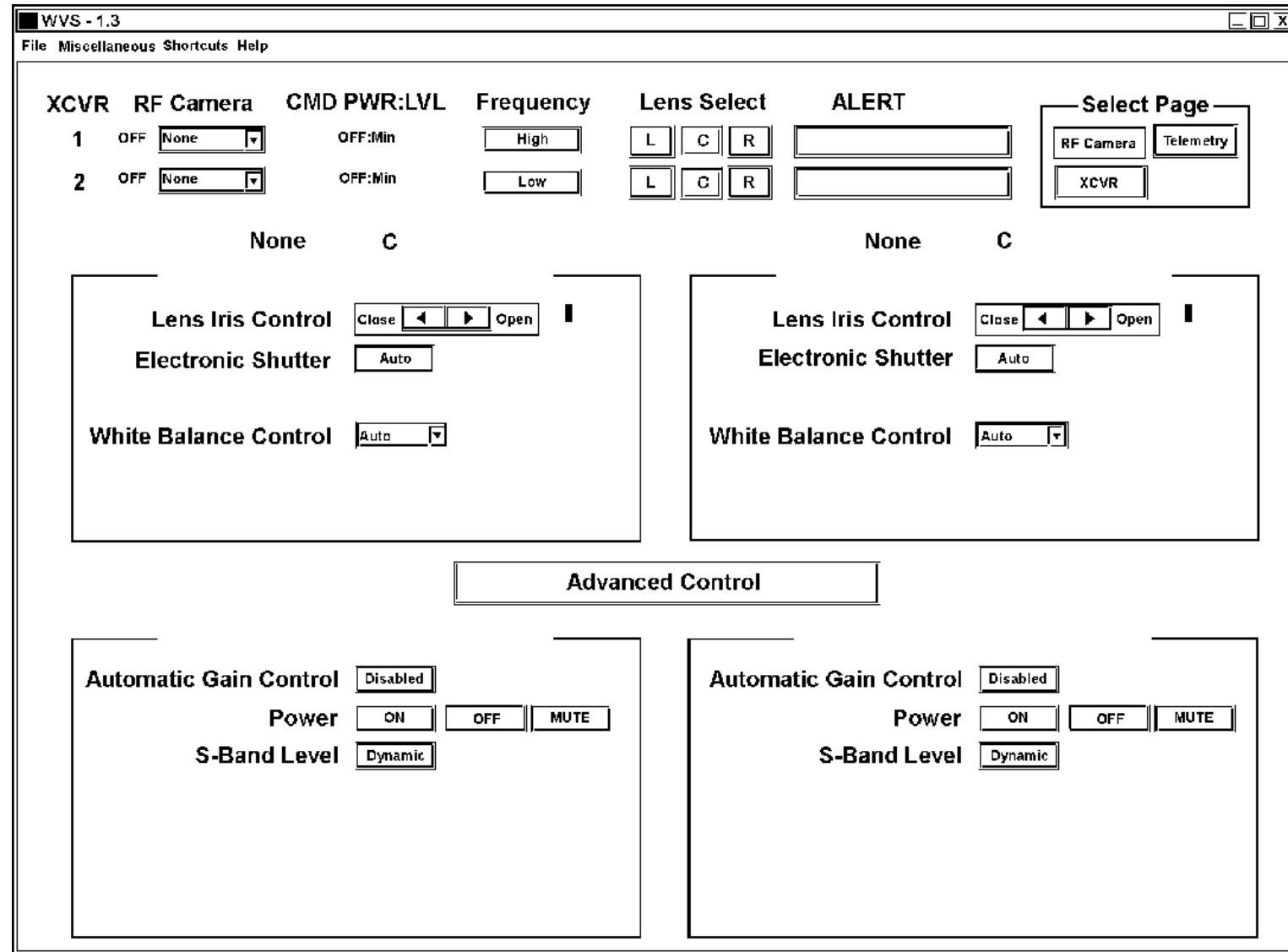
Displays RF Camr(PLB XCVR) temp has gone out of limits (ERCA <-35° C or >+85° C, XCVR <-40° C or >+85° C)

Select Page Icons  
[RF Camera,XCVR,Telemetry]

Provides selection between the three displays

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – RF CAMR PAGE



jsc48037\_081.cnv

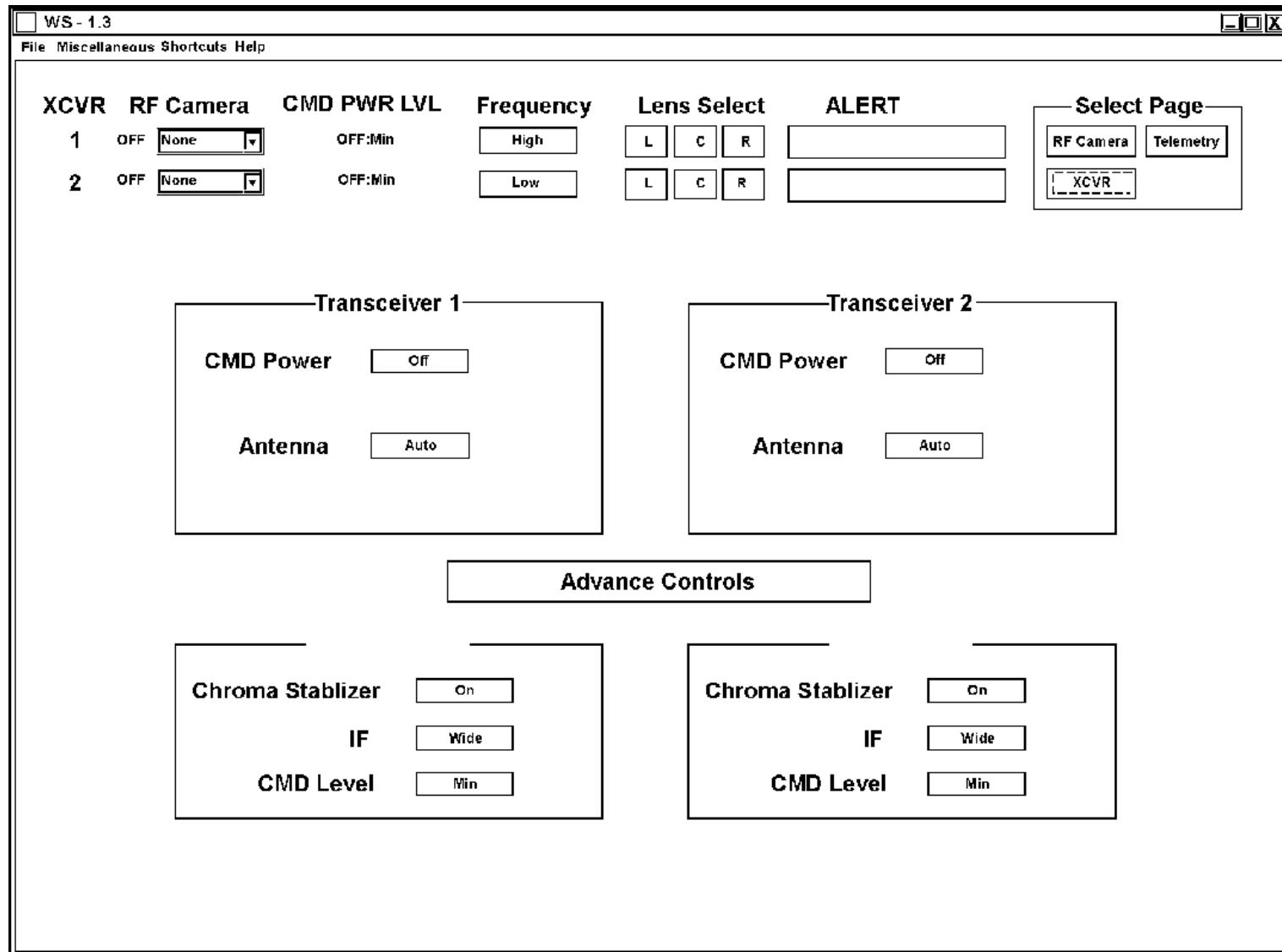
## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – RF CAMR PAGE (Concluded)

<u>Lens Iris Control</u> [Close,Open]	Opens(closes) Iris for selected lens. No telemetry other than video. Number displayed shows motor speed. Can click,hold
<u>Electronic Shutter Control</u> [Auto,Manual]	Brightens(darkens) image scene by controlling electronic shutter. Manual status runs from dark (0 = tbd sec) to bright (100 = 1/60 sec). Initial value = 50. Afterwards, setting stays where it was left
<u>White Balance Control</u> [Auto,2800K,6100K,Variable]	Determines how white balance set for Camr  2800K – PLB lights 6100K – Sunlight Variable – Allows red,blue gain control
<u>Automatic Gain Control</u> [Disabled,Enabled]	Controls status of AGC. Enabled needed for dark subjects; otherwise, it is disabled to reduce noise on video
<u>Power Status</u> [On,Off,Mute]	Status of RF Camr transmitter. Related to top status or RF Camr (black off, green on). Mute stops video signal from being sent to antenna
<u>S-Band Level</u> [Dynamic,Maximum]	Dynamic (default) – Pwr adjusted per signal strength seen at receiver (adjusted to be received at -40dB) Maximum – Sends signal at full pwr for signal strength problems
<u>Black Pedestal</u> [Increase,Decrease]	NOT USED. Brightness control varies from 0 to 100
<u>Zoom,Focus,LED Control</u>	NOT AVAILABLE. Future capabilities

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – XCVR PAGE



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## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – XCVR PAGE (Concluded)

<u>CMD Power</u> [OFF,ON]	Activates XCVR cmd processor. Only one XCVR can perform this duty. XCVR 1,2 selections are mutually exclusive and an ON cmd will automatically turn the other OFF. Status also shown under CMD PWR:LVL in top status area
<u>Antenna</u> [Auto,Manual]	Controls antenna selection method. Auto (default) picks antenna based on strongest signal strength. Manual provides antenna number selection. Antenna numbering sequence shown on WVS cue card
<u>Chroma Stabilizer</u> [On,Off]	NOT USED
<u>Intermediate Frequency (IF)</u> [Wide,Narrow]	Controls bandwidth sampled for RF Camr return signal. Changed to Narrow during signal strength troubleshooting
<u>CMD Level</u> [Min,Max]	NOT USED w/new spread spectrum XCVRs. Status shown under CMD PWR:LVL in top status area

## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – TELEMETRY PAGE

WS - 1.3

File Miscellaneous Shortcuts Help

XCVR	RF Camera	CMD PWR LVL	Frequency	Lens Select	ALERT	Select Page
1	OFF <input type="button" value="None"/>	OFF:Min	<input type="button" value="High"/>	<input type="button" value="L"/> <input type="button" value="C"/> <input type="button" value="R"/>	<input type="text"/>	<input type="button" value="RF Camera"/> <input type="button" value="Telemetry"/>
2	OFF <input type="button" value="None"/>	OFF:Min	<input type="button" value="Low"/>	<input type="button" value="L"/> <input type="button" value="C"/> <input type="button" value="R"/>	<input type="text"/>	<input type="button" value="XCVR"/>

RF Camera System Telemetry

RF Camera Lens		UHF		Power		Temperature (C)			
		Signal Strength	RX Good	Voltage	Amperes	Electronics	L	C	R
???	- 1 M	RM	-1.00 M	-1 M	0.00 M	0.00 M	32 M	32 M	32 M
???	- 1 M	RM	-1.00 M	-1 M	0.00 M	0.00 M	32 M	32 M	32 M

Transceiver Telemetry

Temperature (C)		S Band			Power			
		Signal Strength	Antenna Select	Antenna Mode	Voltage	Amperes		
XCVR 1	32 M	0.00 M	1 M	Manual M	10.00 M	10.00 M		
XCVR 2	32 M	0.00 M	1 M	Manual M	10.00 M	10.00 M		
Quads 1	1 0.0 M	2 0.0 M	3 0.0 M	4 0.0 M	5 0.0 M	6 0.0 M	7 0.0 M	8 0.0 M
Quads 2	1 0.0 M	2 0.0 M	3 0.0 M	4 0.0 M	5 0.0 M	6 0.0 M	7 0.0 M	8 0.0 M

jsc48037\_083.cnv

## WIRELESS VIDEO SYSTEM (WVS) (Concluded)

### SOFTWARE – TELEMETRY PAGE (Concluded)

#### RF Camr System Telemetry

<u>RF CAMERA</u>	Displays RF Camr title
<u>Lens</u> [L,C,R]	Displays currently selected lens
<u>UHF Signal Strength</u> [nom = -120 to -59]	Displays cmd link signal strength in dB seen at RF Camr
<u>UHF RX Good</u>	NOT USED
<u>Pwr Voltage</u> [nom = 12.8]	Displays RF Camr system voltage
<u>Pwr Amperes</u> [nom = 0.40]	Displays RF Camr system current
<u>Temperature Electronics</u> [nom = 13 to 30]	Displays RF Camr electronics temp in degC. Alert range = -30° to -35° C and +80° to +85° degC. Caution range = <-35° and >+85° degC
<u>Temperature L,C,R</u> [nom = 0 to 33]	Displays RF Camr left Camr temp in degC. Alert range = -30° to -35° C and +80° to +85° C. Caution range = <-35° C and >+85° C

#### Transceiver Telemetry

<u>XCVR 1,2 Temperature</u> [nom = 18 to 37]	Displays XCVR temp in degC. Alert range = -40° to -35° C and +80° to +85° C. Caution range = <-40° and >85° C
<u>S-Band Signal Strength</u> [nom = 97.5 to -10.5]	Displays return signal strength seen at XVCVR in dB
<u>S-Band Antenna Select</u>	Displays which S-Band antenna the XCVR is using to get video signal
<u>S-Band Antenna Mode</u> [Auto,Manual]	Displays XCVR antenna selection mode
<u>Power Voltage</u> [nom = 12.42]	Displays XCVR system voltage
<u>Power Amperes</u> [nom = 1.10]	Displays XCVR system current
<u>Quads 1,2</u>	Displays current signal strength for each XCVR's selected S-Band antenna in dB showing strongest of antenna quads

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## SEQUENTIAL STILL VIDEO (SSV)

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## SEQUENTIAL STILL VIDEO (SSV)

### SSV NOMINAL SETUP

- MA9F
1. Obtain following H/W:  
 SSV Compression Encoder Box  
 SSV BNC to BNC Cable  
 SSV to PDIP/CIP Cable  
 PGSC Pwr Cable  
 Bal/UnBal Xfer

2. Config SSV H/W to PDIP 2  
 Config H/W per dwg at right

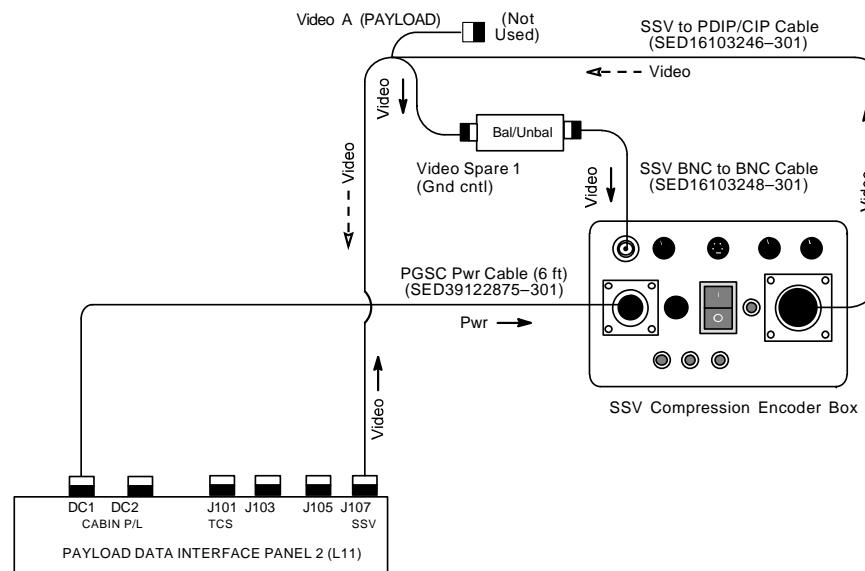
#### NOTE

Video Spare 1 controlled by MCC instead of pnl A7

- L12 (SSP 2)  
 L11 (PDIP 2)
- ✓PDIP 2 PWR 1 (CB3) – cl
  - DC PWR 1 CAB PL – ON

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

4. Inform MCC when SSV SETUP complete



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## SEQUENTIAL STILL VIDEO (SSV) (Continued)

### SSV DEACTIVATION

1. SSV  
SSV Pwr – off  
✓Pwr LED not illuminated  
✓ENC DATA LED not illuminated  
✓FRM DATA LED not illuminated  
✓FILL FRM LED not illuminated  
DC PWR 1 CAB PL – OFF

L11  
(PDIP 2)

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

## SEQUENTIAL STILL VIDEO (SSV) (Continued)

### SPECIFICATIONS

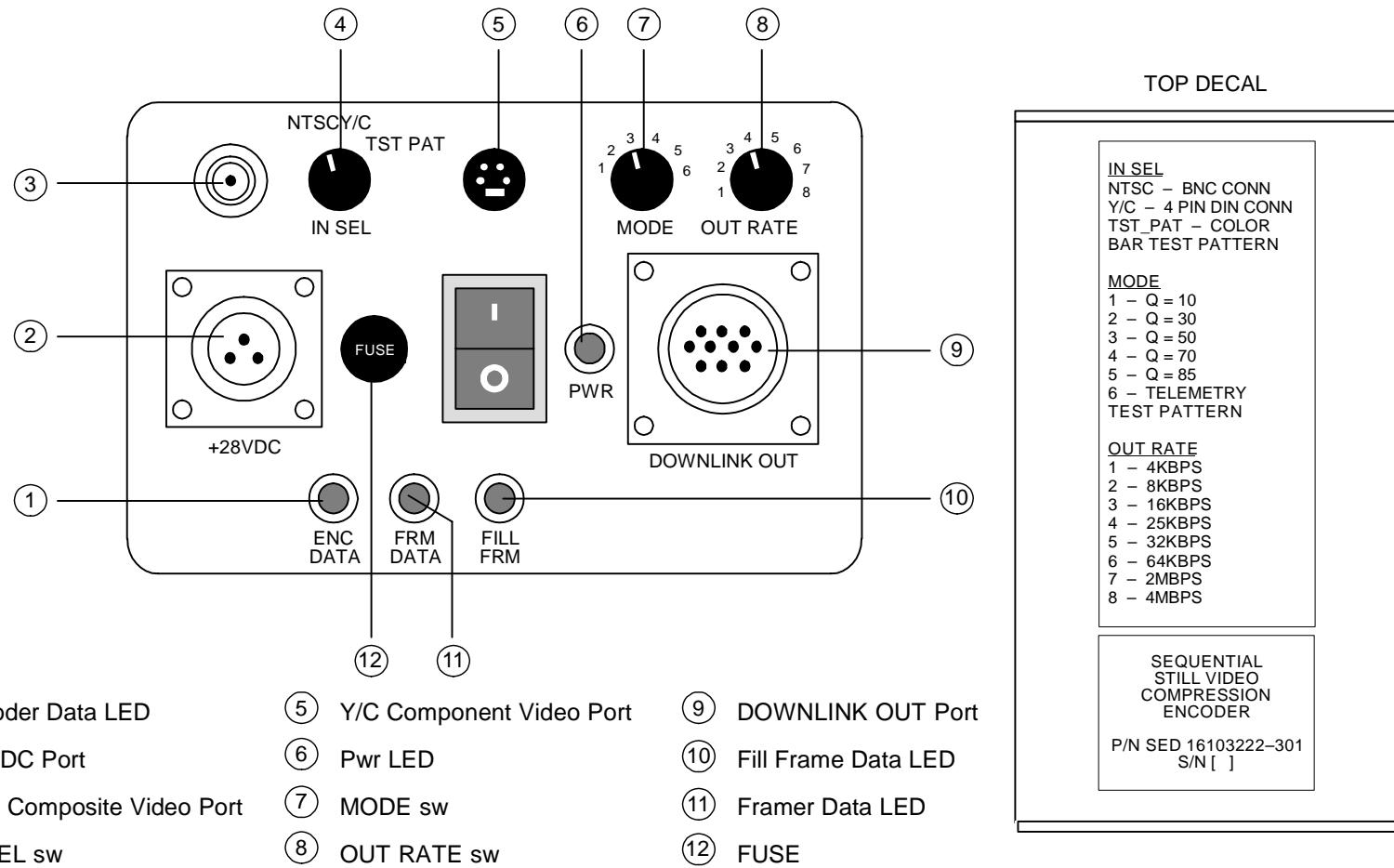
DIMENSIONS: 8.5 in (L) x 4.245 in (W) x 2.72 in (H)

PWR: 28V

FUSE: 2A

WEIGHT: 3.02 lb

### NOMENCLATURE



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## SEQUENTIAL STILL VIDEO (SSV) (Continued)

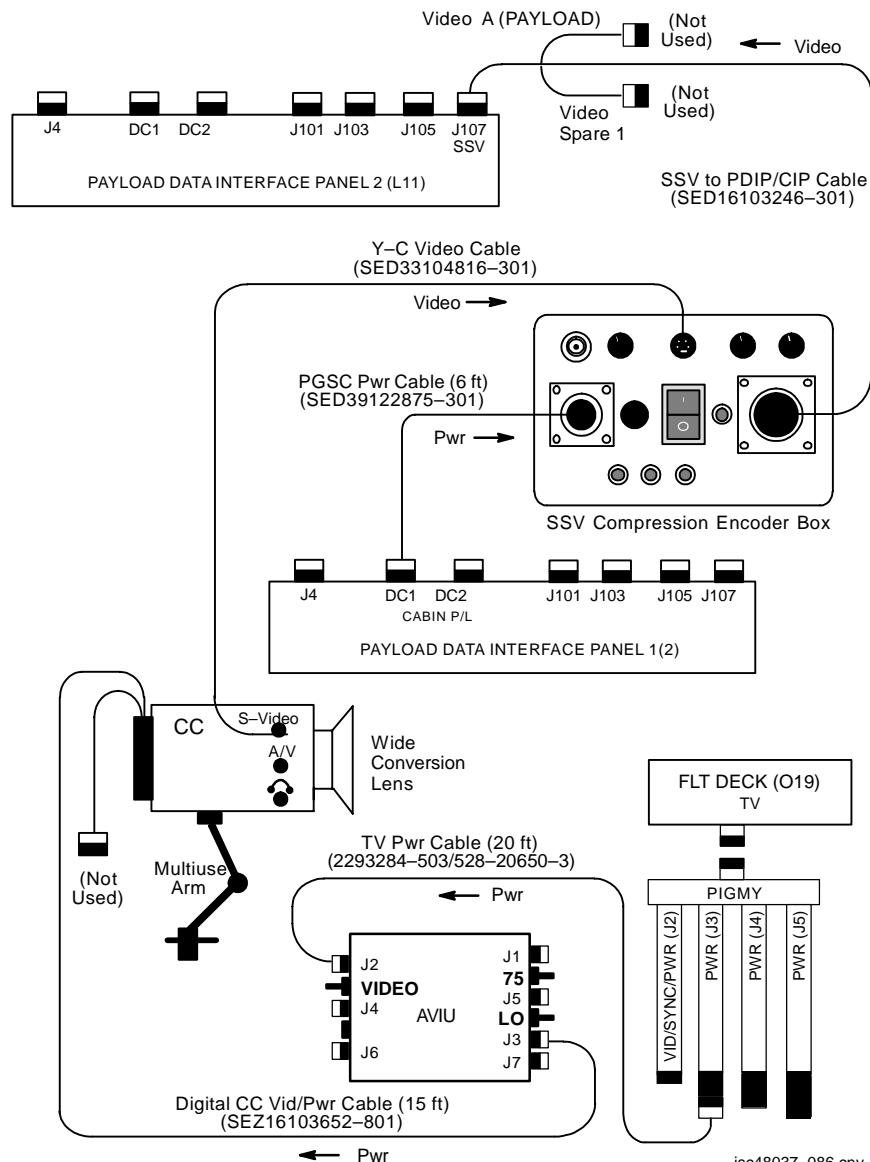
### CAMCORDER VIA SSV

1. Config per dwg at right
2. Camcorder Settings

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

PD100            Lens – 3X  
TV Pwr (O19) – ON  
CC Pwr – ON  
✓Wide Conversion Lens installed  
PWR – CAMERA  
Tape – Remove  
✓Viewfinder displays blinking yellow tape  
Camr Settings  
✓AUTO LOCK – AUTO LOCK  
FOCUS – AUTO  
Multiuse Brkt, Clamp  
Zoom in to check focus; zoom out to frame

3. SSV Settings  
IN SEL – Y/C  
Mode – 5 (may change if desired)  
OUT RATE per FLIGHT PLAN  
SSV Pwr – ON  
✓Pwr LED illum  
✓ENC DATA LED flickering  
✓FRM DATA LED flickering  
✓FILL FRM pulsing



jsc48037\_086.cnv

## **SEQUENTIAL STILL VIDEO (SSV) (Continued)**

### **TEST PATTERN VIA SSV**

1. Perform SSV NOMINAL SETUP, step 1
2. SSV Settings
  - IN SEL – TEST PAT
  - Mode – 3 (may change if desired)
  - OUT RATE per FLIGHT PLAN
  - SSV Pwr – ON
  - ✓Pwr LED illum
  - ✓ENC DATA LED flickering
  - ✓FRM DATA LED flickering
  - ✓FILL FRM pulsing

### **SSV TLM DNLK**

1. Perform SSV NOMINAL SETUP, step 1
2. SSV Settings
  - IN SEL – NTSC
  - Mode – 6
  - OUT RATE per FLIGHT PLAN
  - SSV Pwr – ON
  - ✓Pwr LED illum
  - ✓ENC DATA LED flickering
  - ✓FRM DATA LED flickering
  - ✓FILL FRM pulsing

## **SEQUENTIAL STILL VIDEO (SSV) (Concluded)**

### **MALS**

#### **16.1 PWR LED NOT LIT**

✓Fuse

Replace fuse if blown w/fuse from SSV Fuse Kit  
(SED 15500338-301)

✓DC Pwr from orbiter util

#### **16.2 FRONT PANEL LEDs NOT INDICATING CORRECTLY**

Cycle pwr on SSV Compression Encoder  
SSV Pwr – 0 (off)  
Wait 5 sec  
SSV Pwr – 1 (on)

✓Cables

✓Video source

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## BINOCULARS

	<u>PAGE</u>
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17.1 CANNOT STABILIZE IMAGE .....	17-2

## BINOCULARS

### BINOCULARS

#### SPECIFICATIONS

Model	Stabilization	Pwr	Magnification	Objective Lens (mm)	Exit Pupil	Approx FOV	Approx Linear FOV @ 1000 yd	Approx Minimum Focus (ft)	Weight (lb)
Zeiss 8 X 20	No	N/A	8X	20	2.5mm	6.6°	346.5 ft	9.0	0.39
Fuji 10 X 40 Day/Night	Yes (Gyro)	6AA	10X	40	4.5mm	5.0°	210.0 ft	65.0	5.5
Fuji 14 X 40	Yes (Gyro)	6AA	14X	40	2.8mm	4.0°	210.0 ft	75.0	4.6
Fuji 16 X 70	No	N/A	16X	70	4.4mm	4.0°	210.0 ft	100.0	4.76
Zeiss 20 X 60	Yes (Mechanical)	N/A	20X	60	3.0mm	2.9°	150.0 ft	50.0	3.66

### MALS

#### 17.1 CANNOT STABILIZE IMAGE

- ✓Batts, replace as needed
- If stabilization obtainable, continue nominal ops
- If stabilization not obtainable, ✓MCC

## FIBERSCOPE

### PAGE

SPECIFICATIONS.....	18-2
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DEACTIVATION .....	18-3
FIBERSCOPE LIGHT PWRUP (30 min) .....	18-4
FIBERSCOPE LENS REPLACEMENT .....	18-6

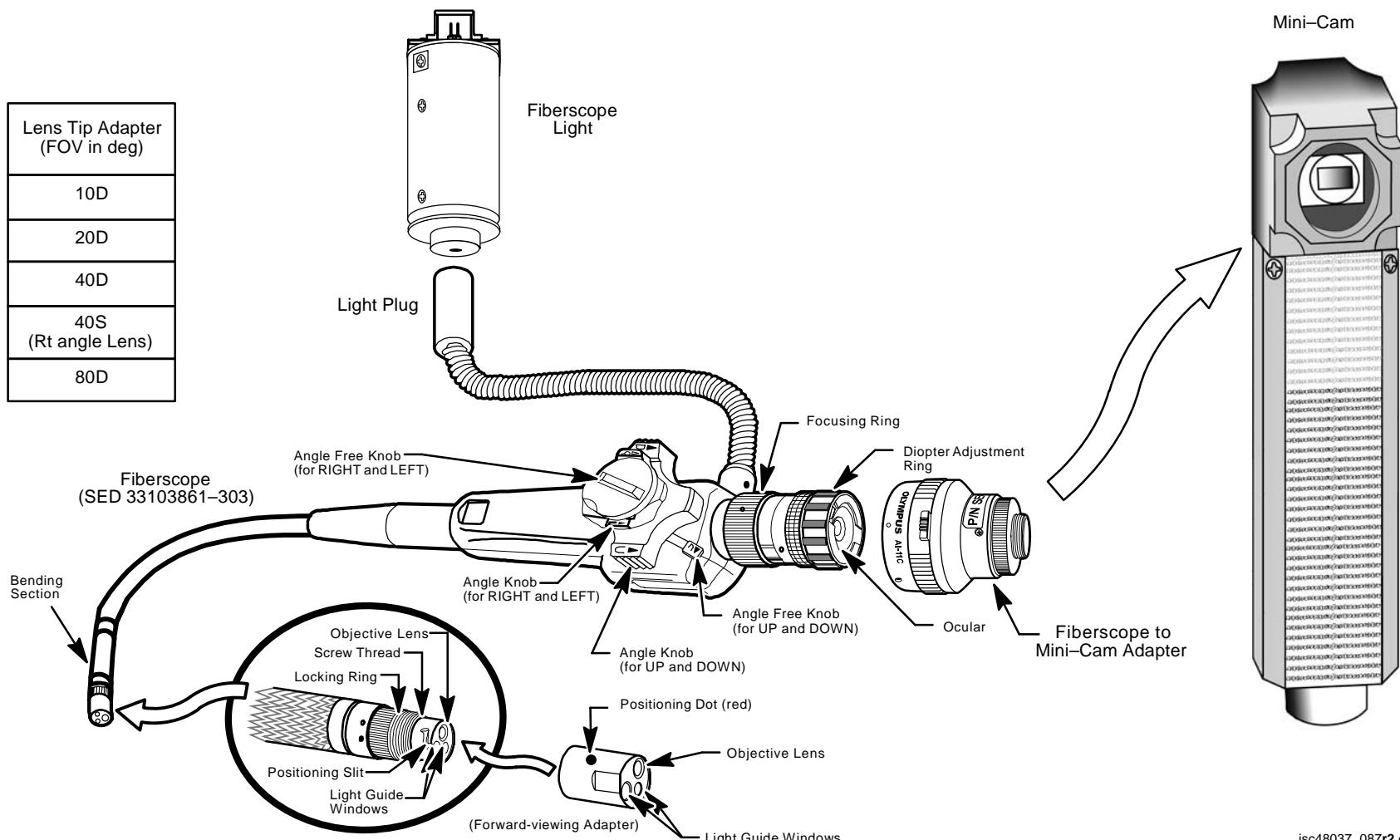
# FIBERSCOPE

## FIBERSCOPE

### SPECIFICATIONS

LIGHT PWR: Orbiter – 6V via IFM Breakout Box

### NOMENCLATURE



jsc48037\_087r2.csv

## FIBERSCOPE (Continued)

### ACTIVATION/OPERATION

- MA9N      1. Unstow Fiberscope Kit, Fiberscope Light, if reqd  
              2. If Fiberscope Light reqd:  
                    Install Fiberscope Light Plug into Fiberscope Light  
                    Perform FIBERSCOPE LIGHT PWRUP, 18-4, steps 1 thru 12  
              3. If installed lens not desired:  
                    Unstow spare lens  
                    Perform FIBERSCOPE LENS REPLACEMENT, 18-6  
              4. If video dnlk(viewing) reqd:  
                    Unstow Fiberscope-to-Mini-Cam Adapter  
                    Screw Adapter into Mini-Cam body lens mount  
                    Mount Adapter to Fiberscope by aligning setter pin w/orange dot, rotate Adapter cw to lock  
                    Perform IN-CABIN MINI-CAM (MINI-CAM)  
                    Route Mini-Cam video to monitor or dnlk:  
                        VID OUT MON 1(2) (DNLK) pb – push  
                        IN FLT DECK(MIDDECK) pb – push  
                    Push button on Adapter and rotate Fiberscope until slit mark on image edge at top of image  
A7            OR  
                    Unstow,install Fiberscope Eyepiece  
              5. Adjust diopter until slit mark clearly visible  
                    Adjust Camr viewing by rotating up/down,left/right angle knobs while free knobs are in F posn  
                    Adjust focus by rotating focus ring

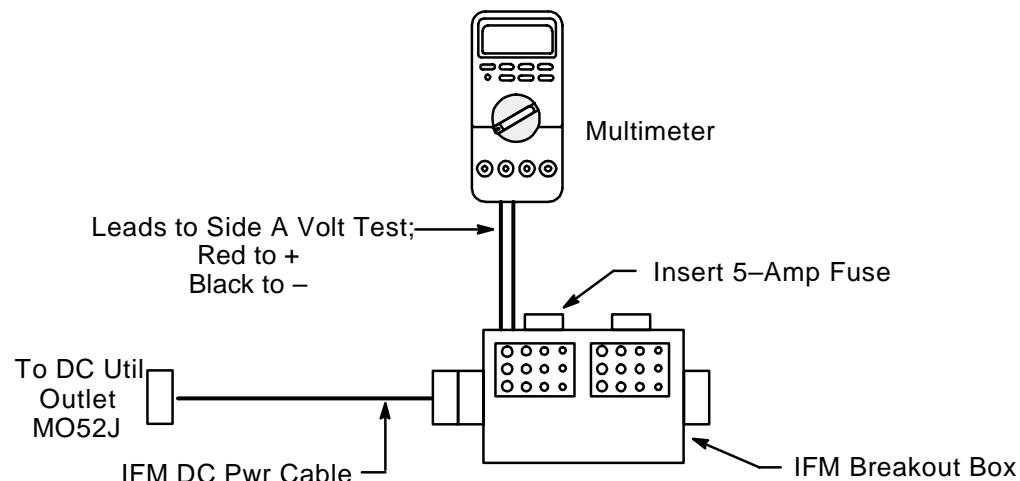
### DEACTIVATION

- O19(MO58F)    1. If Fiberscope Light used:  
                    Perform FIBERSCOPE LIGHT PWRUP, 18-4, steps 13 thru 15  
                    Remove Fiberscope Light from Fiberscope Light Plug  
                    Stow Fiberscope Light  
              2. If Mini-Cam used:  
                    TV Pwr – OFF  
                    Remove Mini-Cam Adapter from Fiberscope  
                    Remove,stow Mini-Cam Adapter from Mini-Cam body  
              3. Remove,stow Fiberscope Eyepiece  
              4. Stow Fiberscope, Fiberscope Kit

## FIBERSCOPE (Continued)

### FIBERSCOPE LIGHT PWRUP (30 min)

1. Unstow:  
Multimeter  
Pin Kit (two 5-in 20 ga Pin/Pin Test Jumper Leads, two 24-in Minigrabbers, 5-Amp Fuse)  
Gray Tape  
IFM Breakout Box  
DC Pwr Cable
- MA9N      2. Remove Battery Holder Assembly from Fiberscope Light
- MO52J      3. √DC UTIL PWR MNA – OFF
4. a. Config Breakout Box:  
AUX – OFF  
28V/VAR VOLT – VAR VOLTS  
PWR A,B – OFF  
b. Remove fuse cap from side A  
c. Rotate GA SEL A – 20  
d. Install 5-Amp Fuse, replace cap
5. Assemble Breakout Box and Multimeter as shown below



jsc48037\_088.cnv

## FIBERSCOPE (Continued)

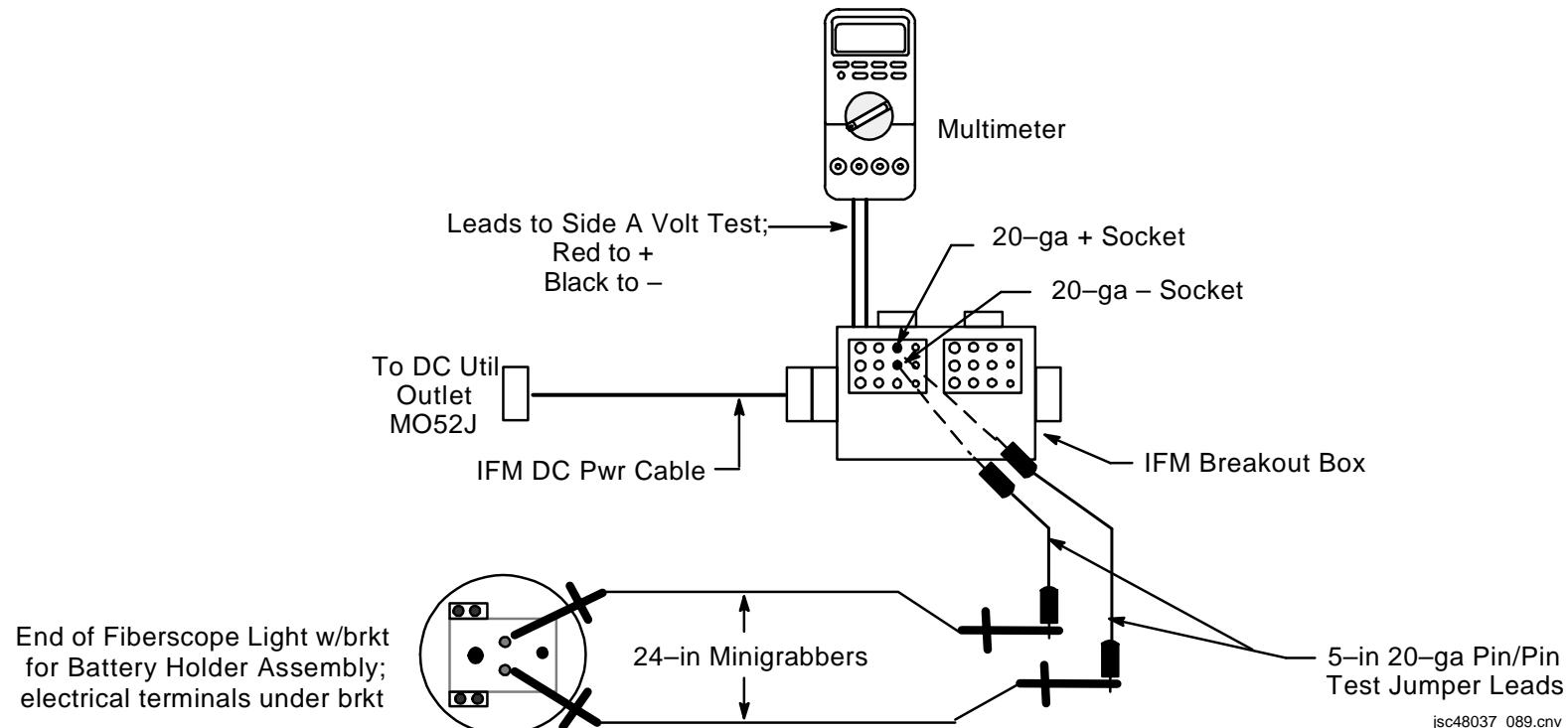
### FIBERSCOPE LIGHT PWRUP (30 min) (Continued)

6. Configure Multimeter for DC V (auto range)
- MO52J 7. DC UTIL PWR MNA – ON
8. Breakout Box:  
√VAR VOLTS – ON (It on)
9. Set VAR VOLTS output by rotating VAR rotary sw until Multimeter reads 6 VDC

NOTE

Positive,negative leads from Breakout Box can be attached to either terminal on Fiberscope Light

10. Install Breakout Box and cables to Fiberscope Light as shown below



## **FIBERSCOPE (Concluded)**

### **FIBERSCOPE LIGHT PWRUP (30 min) (Concluded)**

11. Secure IFM Breakout Box, Multimeter, and PWR Cable in convenient location
12. When ready to operate Fiberscope:  
Breakout Box: PWR A – ON (It on)
13. When finished operating Fiberscope:  
Breakout Box: PWR A – OFF
- MO52J 14. DC UTIL PWR MNA – OFF
15. √Disconnect Minigrabbers, Test Jumper Leads, Multimeter, and IFM DC Pwr Cable

## **FIBERSCOPE LENS REPLACEMENT**

1. Unscrew lock ring from lens until second threads disengage
2. Rotate lens to align green dots
3. Pull lens to engage first threads, unscrew lock ring until lens free
4. Select desired lens and stow removed lens in foam
5. Align green dots on lens and Fiberscope; slowly push lens on until lens stops against first threads; screw on lens until first threads disengage
6. Rotate lens until green dot aligns w/Fiberscope red dot
7. Push lens into Fiberscope until it stops against second threads, screw on lens until second threads fully engaged

## NIGHT VISION EQUIPMENT

NOTE  
Not being flown

**NIGHT VISION**

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## LASER DYNAMIC RANGE IMAGER (LDRI)

### PAGE

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ITVC, LDRI, AND PTU INTERACTIONS.....	20-7
OPP PANEL .....	20-8
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MONITOR INDICATIONS FOR LDRI VIDEO.....	20-11

## **LDRI**

### **LASER DYNAMIC RANGE IMAGER (LDRI)**

#### **SPECIFICATIONS**

CAMERA MODEL: Sony XC-ST70

PIXEL COUNT: 720 x 480

CAMERA SENSOR FOV: 15 x 19.7 deg

FOCAL LENGTH: 50.6mm

IRIS: Fixed at F11

FOCUS: Fixed at 6 ft

LASER MODEL & TYPE: LaserTelLT-1110-20W-CS, Class IV rated @ 20W and limited to 11W

LASER WAVELENGTH: 805 nm +/- TBD based upon laser temperature

LASER COVERAGE: 23.7 (vertical) x 19.9 deg (horizontal)

CAMERA/LASER PARALLAX: Approx 1.5 in horizontal

HAZARD ZONE: 9 ft

MOUNTING INTERFACE: Bottom of ITVC (ITVC specifications in CCTV section)

POINTING CAPABILITY: Standard Pan Tilt Unit (PTU)

PAN RANGE: 179.8 deg

TILT RANGE: 300 deg

ITVC ILLUMINATOR: LDRI

WEIGHT: 6.5 lb + 3 lb counter-weight

DIMENSION: 11 in (L) x 5.88 in (W) x 4.0 in (H)

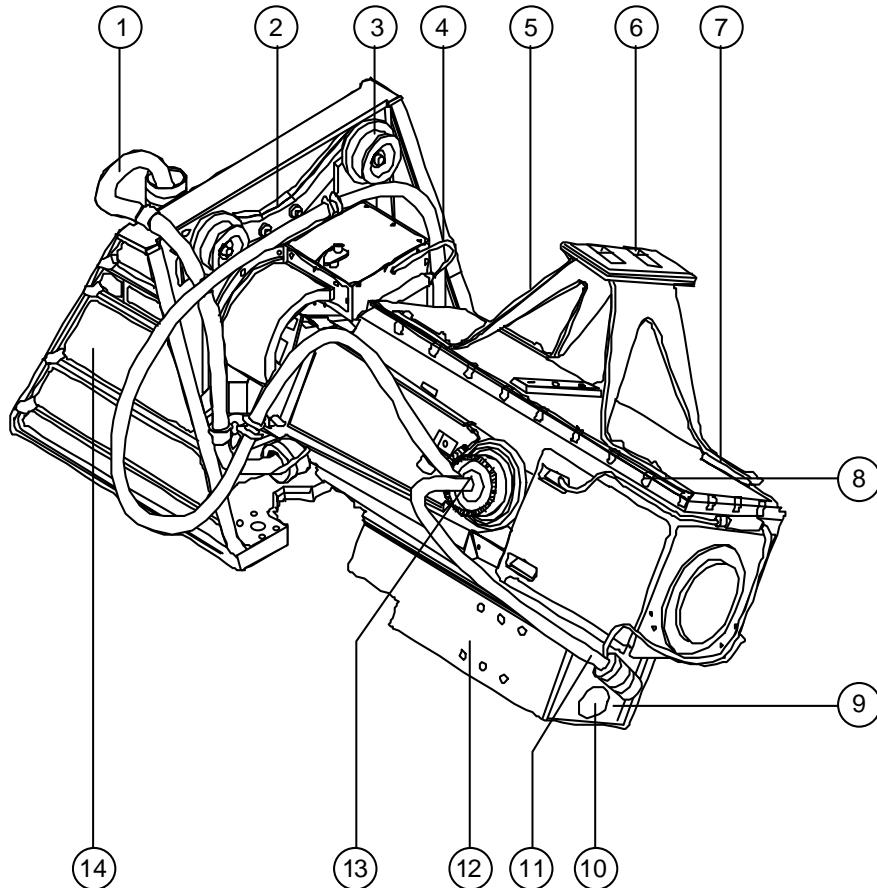
PWR: 28V +/- 4V

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

### NOMENCLATURE

#### NOTE

Thermal covers are not depicted



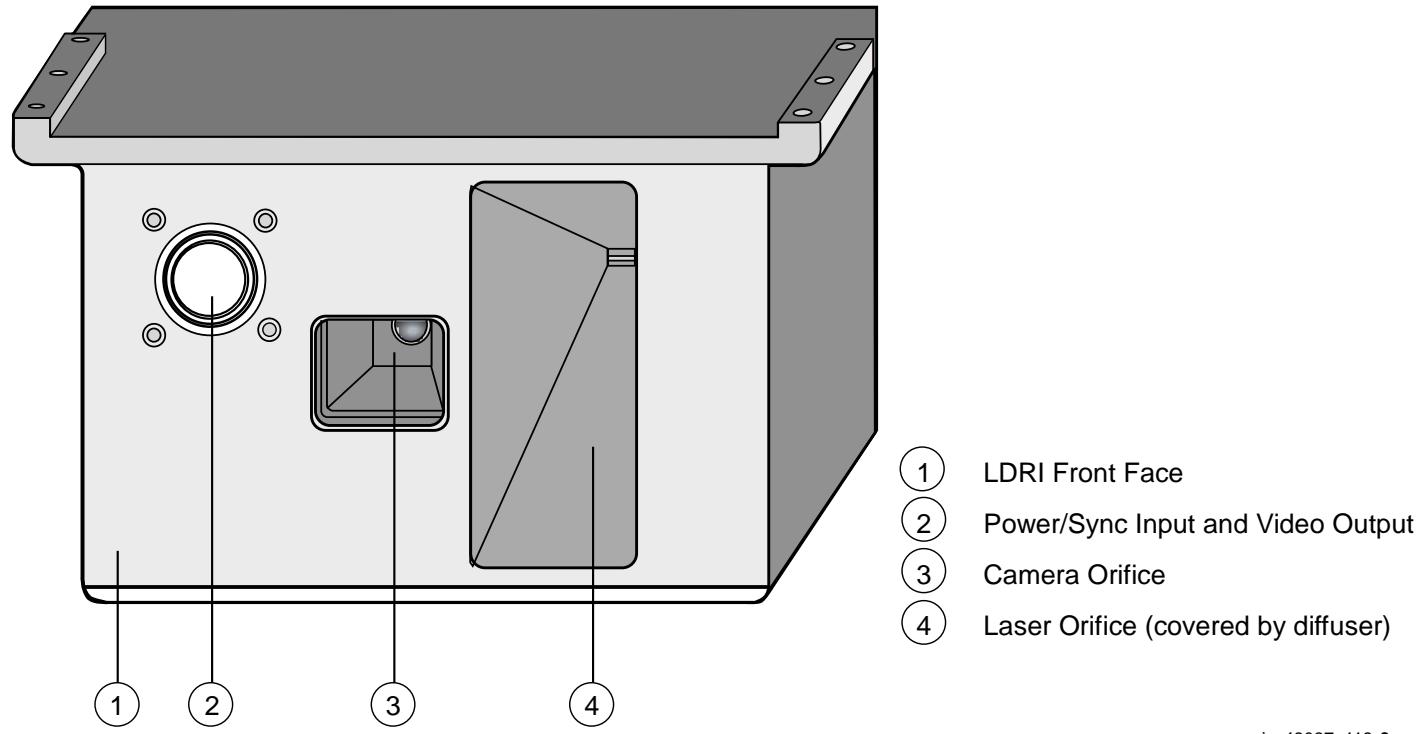
- (1) W601 Interface Cable Assembly (EVA releasable at boom I/F)
- (2) Isolator Plate
- (3) Isolator (x4)
- (4) PTU External Thermistor Interface Cable\*
- (5) Counterweight Support
- (6) Counterweight
- (7) ITVC
- (8) ITVC External Thermistor Interface Cable\*
- (9) LDRI Laser Diffuser
- (10) LDRI Camera Orifice
- (11) LDRI Power/Sync Input and Video Output
- (12) LDRI
- (13) ITVC Power/Sync Input and Video Output
- (14) Boom Interface Bracket (EVA Releasable)

\* Items 4 and 8 are subsets of item 1, the W601 Interface Cable Assembly

jsc48037\_117r2.csv

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

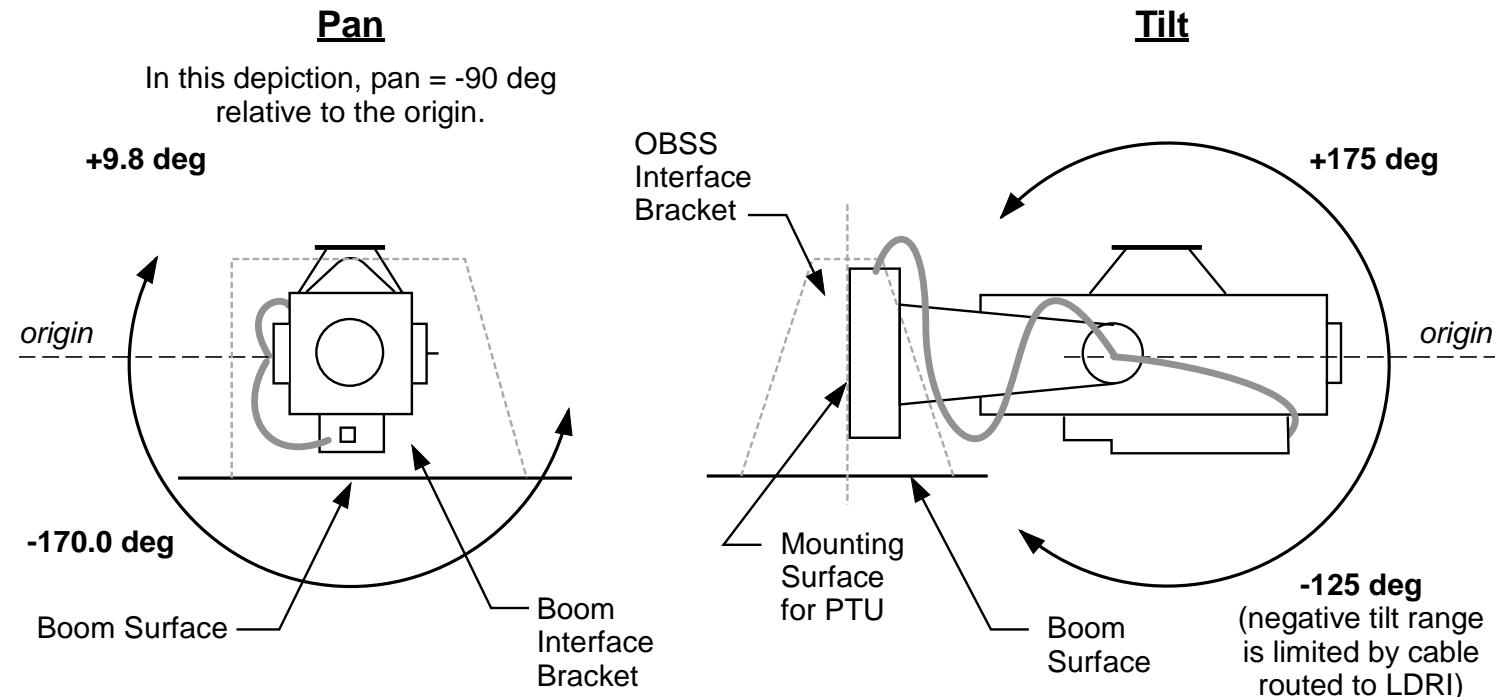
### NOMENCLATURE (Concluded)



jsc48037\_118r3.csv

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

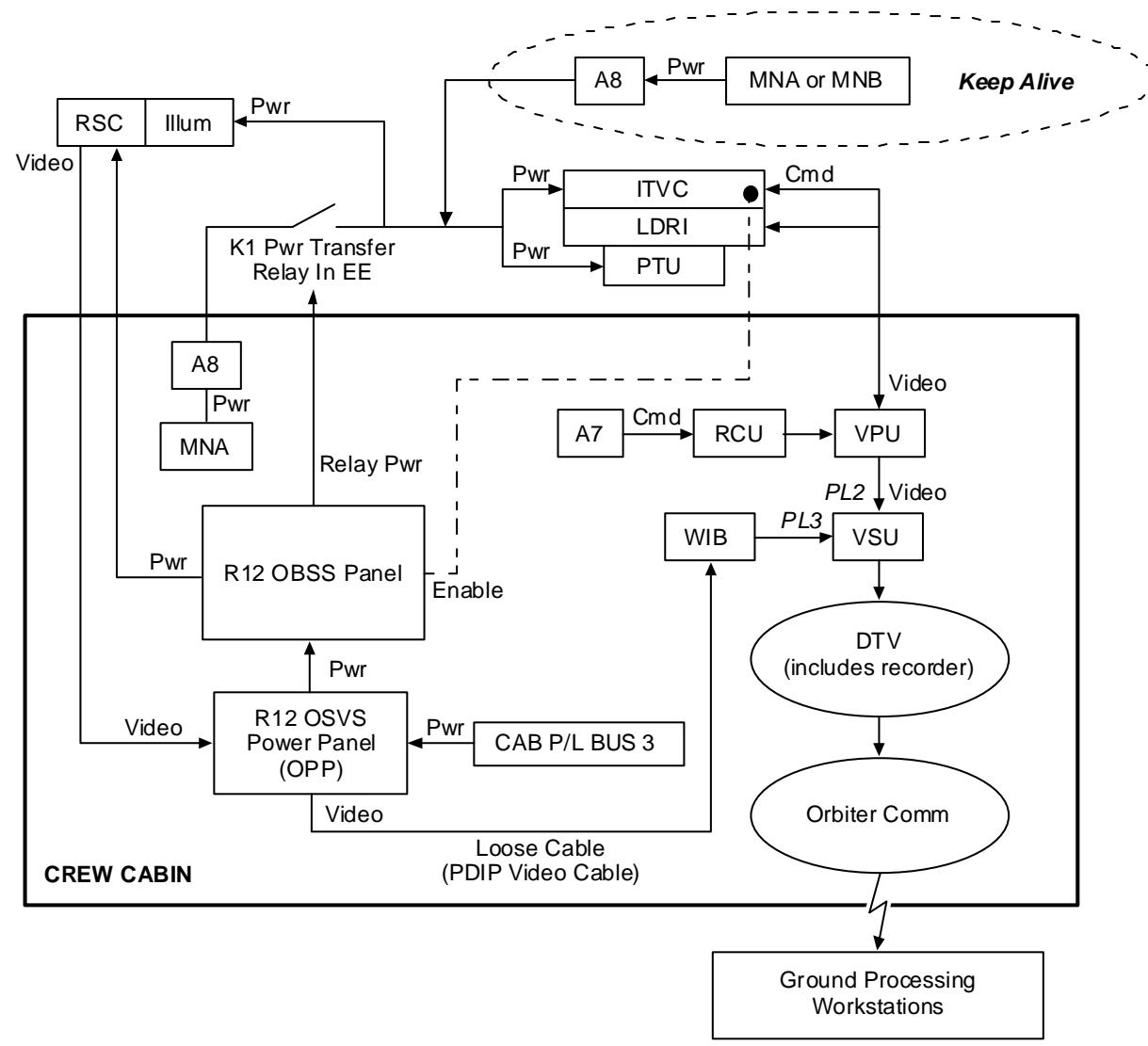
### OBSS PTU PAN AND TILT RANGES



jsc48037\_119r2.csv

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

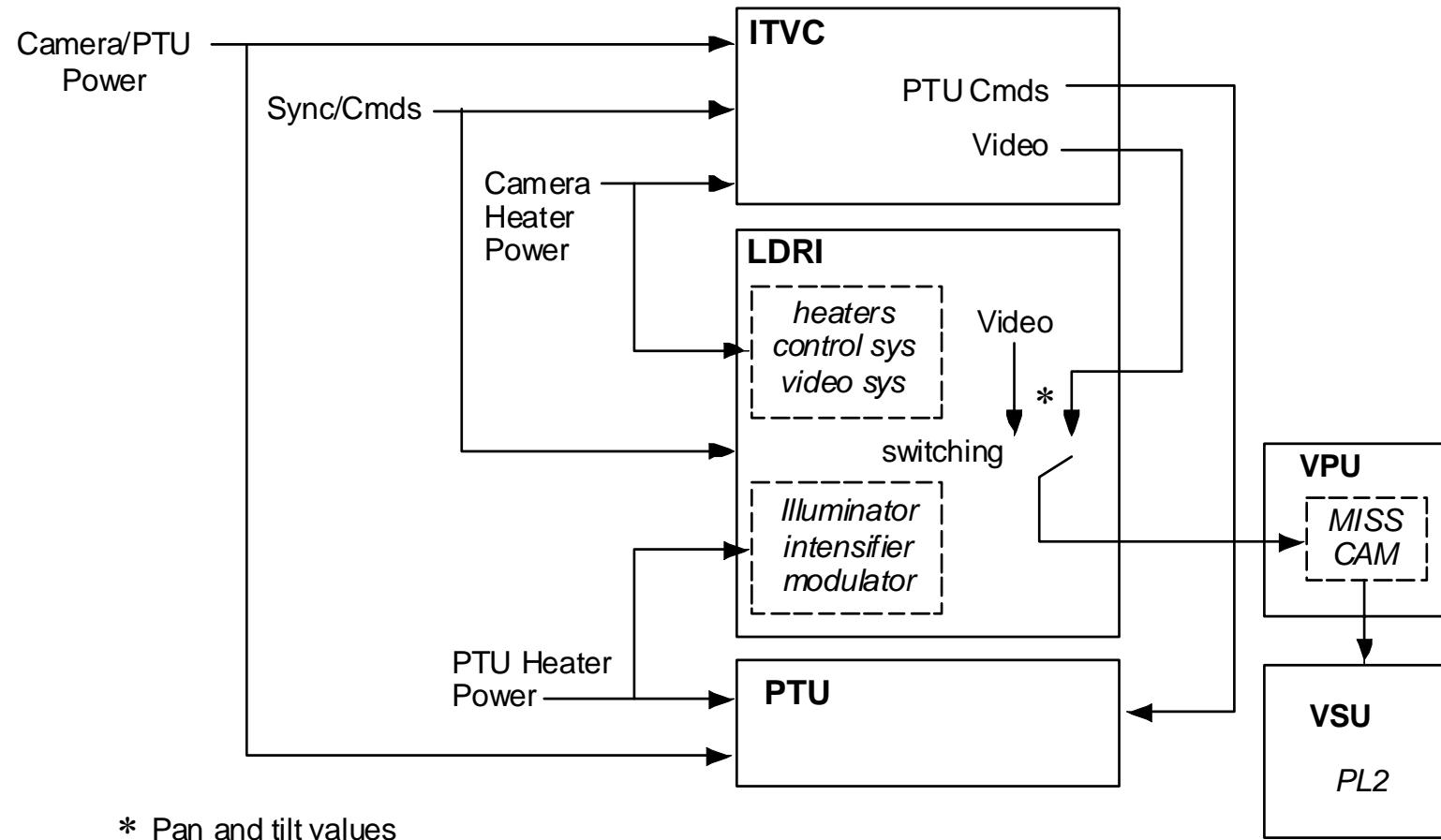
### FUNCTIONAL FLOW



jsc48037\_120r2.cwx

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

### ITVC, LDRI, AND PTU INTERACTIONS



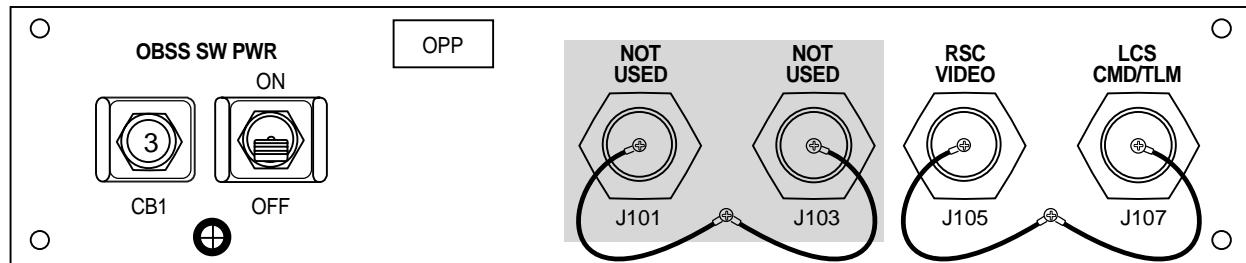
\* Pan and tilt values  
for display on MON

jsc48037\_121r2.csv

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

### OPP PANEL

R12



jsc48037\_123r1.cvx

#### OBSS SW PWR (CB1 AND S1)

- Closure of 3-amp OBSS SW PWR cb followed by sw will provide CAB PL3 POWER to R12 OBSS panel

#### RSC VIDEO (J105)

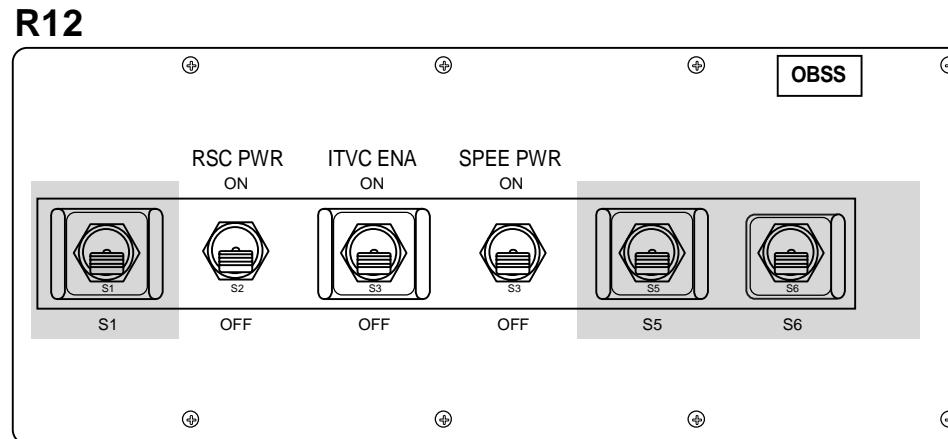
- Provides balanced, asynchronous video from RMS Sideview Camr (RSC)
- Video will be routed to VSU PL3 input on R12/VPU/WIB using PDIP Video Cable to support viewing/recording/dnlk ops

#### LCS CMD/TLM (J107)

- Provides PGSC interface for crew control, data, and telemetry for Laser Camr System (LCS) and ISIS Digital Camr (IDC)

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

### OBSS PANEL



jsc48037\_124r1.csv

#### RSC PWR (S2)

- Provides CABIN PL3 POWER to RMS Sideview Camr (RSC) and its heater
- Heater must remain active for duration of mission

#### ITVC ENA (S3)

- ON sends an enable command to the OBSS ITVC
- SPEE PWR must be ON prior to ITVC enable
- OFF disables Camr. A 10 sec wait reqd before re-enabling

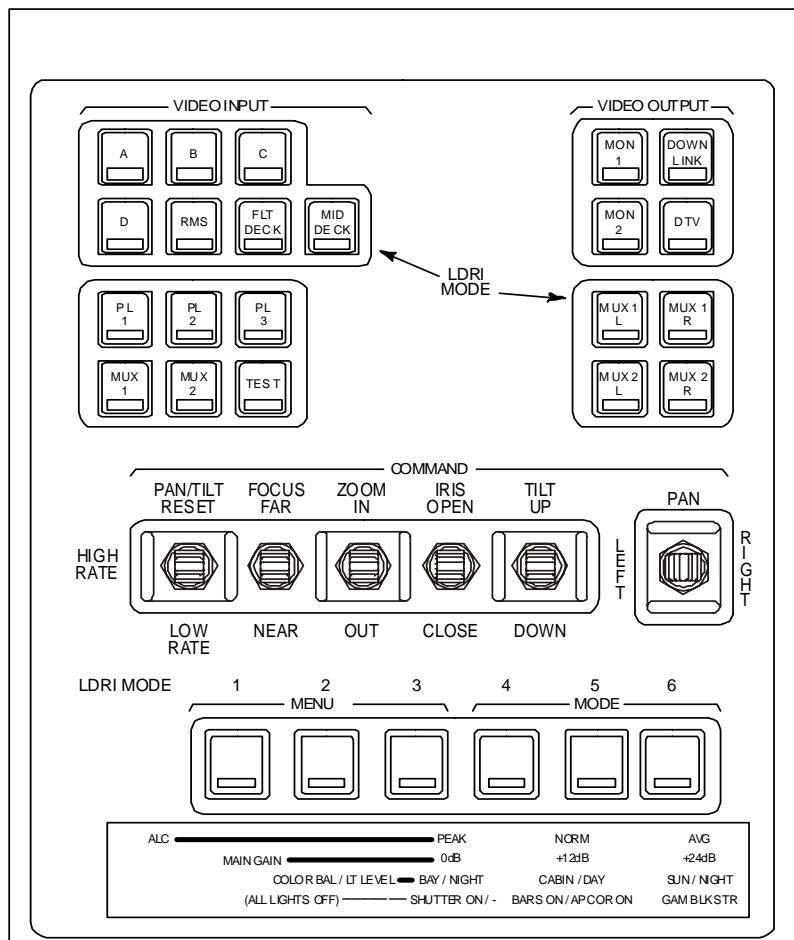
#### SPEE PWR (S4)

- ON closes K1 pwr relay in RMS End Effector. Pwr flows to OBSS ITVC/LDRI/PTU and to RSC illuminator. Upon initial relay closure, illuminator has pwr but not active
- After initial closure of K1 relay, cycling SPEE PWR sw to OFF, then ON will command RSC illuminator to full pwr (156 LEDs). Subsequent K1 relay cycling will take illuminator to med pwr (84 LEDs), then low pwr (30 LEDs), then OFF, and then back to full pwr
- Cycling K1 relay OFF, then ON will rest OBSS PTU pan and tilt values to zero; take LDRI to stby (Mode 1) and ITVC to manual state

## LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

### A7 PANEL

A7



jsc48037\_125r3.csv

### NOTE

Command interfaces listed below pertain only to OBSS LDRI and not to OBSS ITVC/PTU. Commands to ITVC/PTU handled by selecting PL2 as video input and treating that address in same manner as PLB ITVC

### MUX1(2)R(L), MIDDECK pb

- Selection of any of four VIDEO OUTPUT MUX pb followed by VID IN MIDDECK pb enables commanding of OBSS LDRI

### IRIS sw

- IRIS sw provides gain cntl for LDRI Modes 3,4,5,6. Feedback is available in MON Lens Data in place of T-stop
- Gain range – 70 (brightest) to 280 (darkest). Default value – 280
- Gain applied on one of Modes 3(4,5,6) will apply to other three. Gain returns to default value by selecting Mode 1

### MODE, MENU pb

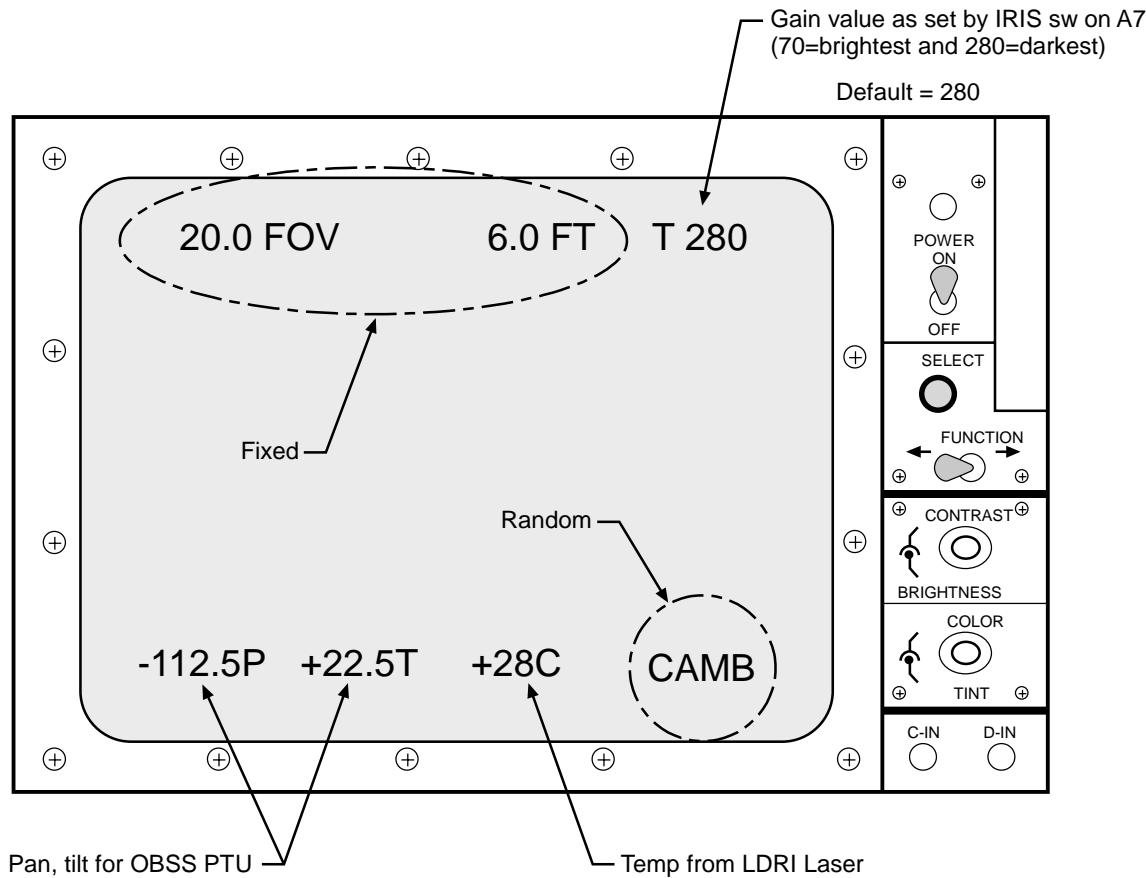
- Six MODE/MENU pb, left to right, allow selection of LDRI modes 1 thru 6:
  - MODE 1 – STANDBY
  - MODE 2 – ILLUMINATOR
  - MODE 3 – 2D
  - MODE 4 – 2D GAMMA
  - MODE 5 – 3D
  - MODE 6 – 3D GAMMA
- If OBSS/ITVC cntl selected (by depressing VID OUT pb selected for PL2) while in LDRI modes 3(4,5,6), LDRI video will continue to flow to VID OUT. For this scenario, all ITVC cmds active in blind
- Mode fdbk for Modes 3,4,5,6 avail when PL2 illuminated. In Modes 1 and 2, MODE/MENU pb indicate ITVC exposure setting, not mode

## LASER DYNAMIC RANGE IMAGER (LDRI) (Concluded)

### MONITOR INDICATIONS FOR LDRI VIDEO

#### NOTE

LDRI video assigned to PL2 using R12/VPU MISS CAM jumper posn. LDRI video (Modes 3-6) will have black rounded corners. Lens data and green Camr data ON for this illustration



jsc48037\_122r3.cvx

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## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC)

LCS SPECIFICATIONS .....	21-2
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IDC SPECIFICATIONS .....	21-8
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IDC SOFTWARE GUI .....	21-10
LCS/IDC COMBINED NOMENCLATURE .....	21-14
LCS/IDC KEEP ALIVE PWR AND DATA INTERFACES (Berthed on MPMs) .....	21-15
LCS/IDC (HEATER ONLY MODE)/(OPERATIONAL PWR MODE) DATA AND PWR INTERFACES .....	21-16
LCC SOFTWARE EXIT DIALOGUE BOXES .....	21-17
MANUAL A31p DESKTOP DNLK SETUP .....	21-18
RECONFIGURATION OF A31p SCREEN RESOLUTION .....	21-20

I

**LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC)****LCS SPECIFICATIONS**

LASER WAVELENGTH: ≈1500 nm, near-IR

LASER CLASSIFICATION: Class 3b

OPERATIONAL RANGE: 4-10 ft

LASER SPOT SIZE: 0.04 in @ 4.5 ft

**HAZARD ZONE:**

Nominal Hazard Keep Out Zone (KOZ) – 5 ft

Worst Case Hazard KOZ – 64 ft

**LASER COVERAGE:**

Detailed Area and Quick View Scan Modes – 30 x 30 deg

Continuous Line Scan Mode – Variable 2 to 42 deg

LINEAR DETECTION ARRAY (LDA): 256-pixel linear array CCD w/13-bit intensity dynamic range

LCH WEIGHT: 24.5 lb

LCH DIMENSIONS: 11 in (L), 10 in (W), 5.6 in (H)

**LCH PWR MODES/SOURCES:**

OBSS State	Pwr	Source
Operational/RMS Grappled	124V	APCU1
MPM Berthed	28V	MNA and MNB (only LCH, IDC heaters in this mode)

**HEATER PWR MODES/SOURCES:**

Heater	Pwr	Source
124V Heater (RMS Grappled)	124V	APCU1 (SSP1 APCU1 CONV and OUTPUT RLY sws)
28V Heater (MPM Berthed)	28V	MNA and MNB (PnI A8 STBD HTRS A,B sws) (only LCH, IDC heaters in this mode)

**LASER SCAN MODES:**

Detailed Area – Two-directional scanning in rectangular pattern (used for "stop and stare" ops). Both X,Y mirrors used

Quick View – Low-resolution detailed area-scan mode

Continuous Line – One-directional scanning passes thru optical center of FOV (used for scanning ops). RMS provides scanning motion

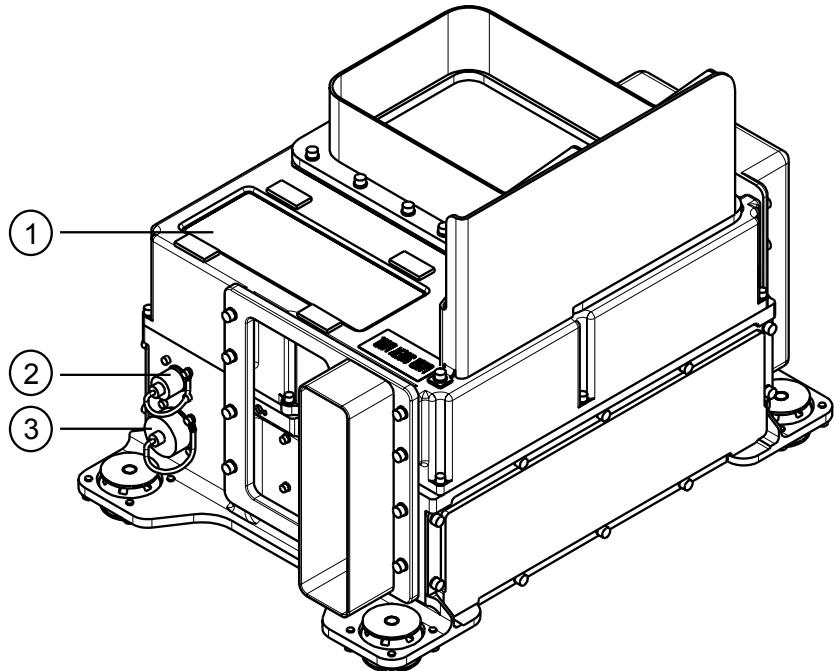
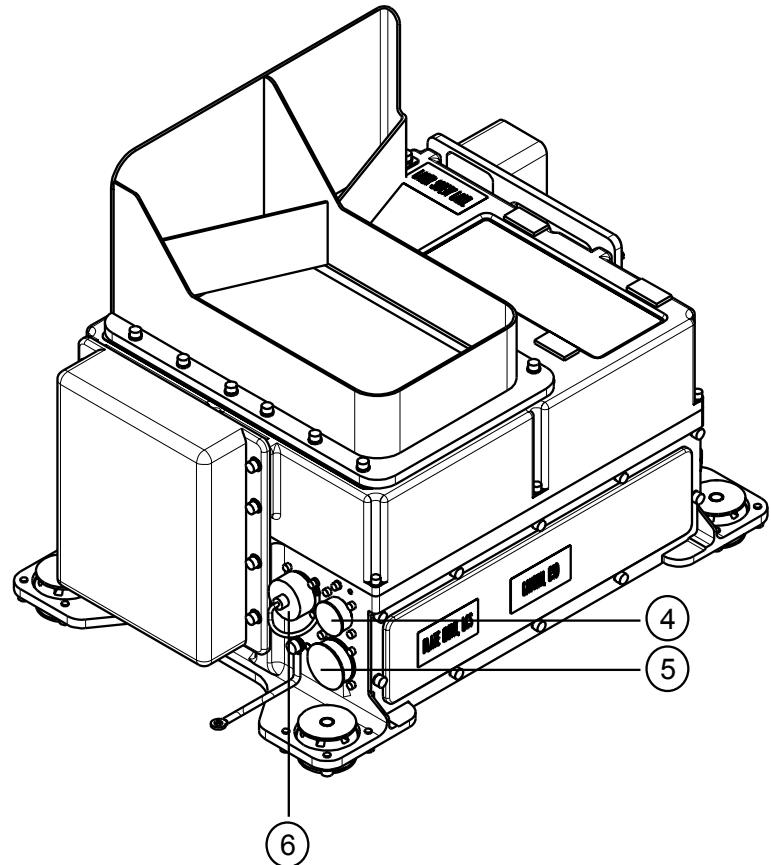
**CREW CONTROL:**

Hardware – LCC (Laser Camr Controller – A31p)

Software – LCC software shortcut (Shuttle Apps\IDC)

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

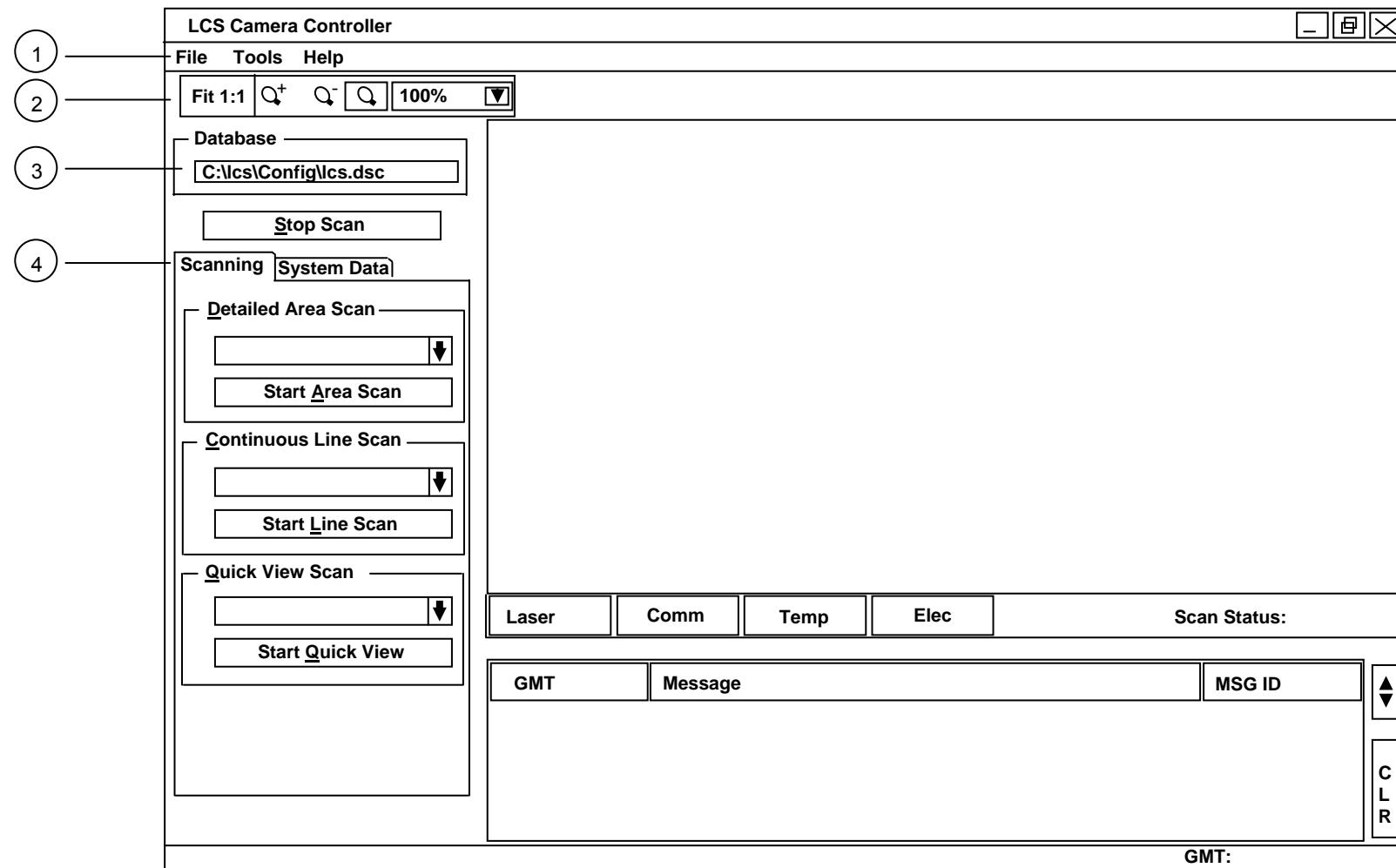
### LCS NOMENCLATURE



- ① Laser Orifice
- ② RS422 Connector (J4)
- ③ Test Connector (J3)
- ④ COMMS/DATA Connector (J2)
- ⑤ POWER Connector (J1)
- ⑥ Ethernet Peripheral Device Connector (J5)

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### LCC SOFTWARE GUI



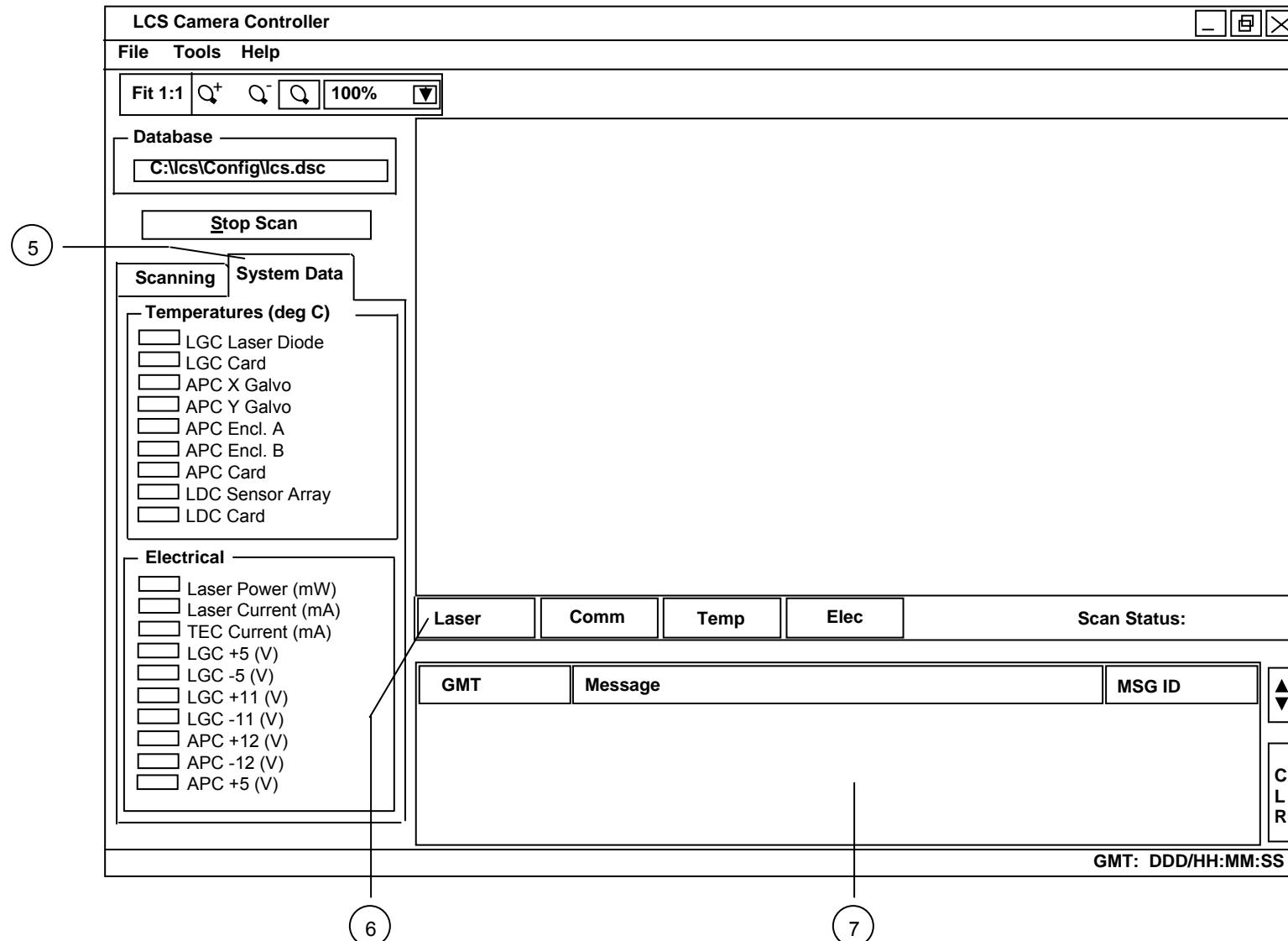
## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### LCC SOFTWARE GUI (Continued)

Menu Bar [File, Tools, Help]																				
1	[File]	<table border="1"> <tr> <td>Open</td><td>Allows user to open and view previous scan bin files. If several open, they are shown in order under File menu</td></tr> <tr> <td>Close</td><td>Closes displayed scan bin file. Appears only when viewing previous scans. If several open, only currently selected file will be closed with this function</td></tr> <tr> <td>Close All</td><td>Closes all scan bin files. Appears only when viewing previous scans. If several open, all files will be closed. Multiple scans collected in series will reside in RAM until cleared with this feature. Good housekeeping feature to use between scan AOIs</td></tr> <tr> <td>Load Database</td><td>Allows user to change current database. When load database option selected, a window will appear and allow user to select another database. Only files w/.dsc extension selectable</td></tr> <tr> <td>Exit</td><td>See LCC SOFTWARE EXIT DIALOG BOXES, 21-17</td></tr> </table>	Open	Allows user to open and view previous scan bin files. If several open, they are shown in order under File menu	Close	Closes displayed scan bin file. Appears only when viewing previous scans. If several open, only currently selected file will be closed with this function	Close All	Closes all scan bin files. Appears only when viewing previous scans. If several open, all files will be closed. Multiple scans collected in series will reside in RAM until cleared with this feature. Good housekeeping feature to use between scan AOIs	Load Database	Allows user to change current database. When load database option selected, a window will appear and allow user to select another database. Only files w/.dsc extension selectable	Exit	See LCC SOFTWARE EXIT DIALOG BOXES, 21-17								
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Exit	See LCC SOFTWARE EXIT DIALOG BOXES, 21-17																			
[Tools]	<table border="1"> <tr> <td>Set GMT</td><td>Sets GMT clock on both LCC,LCH. When selected, window will appear allowing A31p time to be set. LCC time must be within 3 sec of onboard SM GPC. Once clock set, LCC A31p will update it's system clock every 5 min using LCH system clock if LCC GUI running</td></tr> <tr> <td>IDC Control</td><td>Not used. Allows user to pwr on/off IDC. This task preferably done via IDC software</td></tr> <tr> <td>Zoom Toolbar</td><td>Allows Zoom Toolbar to be displayed under Menu Bar</td></tr> <tr> <td>Intensity Adjustments</td><td>Not currently selected(used). Invokes Intensity Adjustment window on GUI so user can adjust Gamma, Brightness, and Contrast of displayed scan image</td></tr> <tr> <td>Peak Status Highlight</td><td>Not currently selected(used). Invokes Peak Status window so user to select voxel status: Below Min Intensity, Above Max Intensity, Overflow, Underflow, Invalid Peak, No Peak, and Multiple Highlights</td></tr> <tr> <td>Status Toolbar</td><td>Allows Status Toolbar to be displayed below GUI. Contains only GMT</td></tr> </table>	Set GMT	Sets GMT clock on both LCC,LCH. When selected, window will appear allowing A31p time to be set. LCC time must be within 3 sec of onboard SM GPC. Once clock set, LCC A31p will update it's system clock every 5 min using LCH system clock if LCC GUI running	IDC Control	Not used. Allows user to pwr on/off IDC. This task preferably done via IDC software	Zoom Toolbar	Allows Zoom Toolbar to be displayed under Menu Bar	Intensity Adjustments	Not currently selected(used). Invokes Intensity Adjustment window on GUI so user can adjust Gamma, Brightness, and Contrast of displayed scan image	Peak Status Highlight	Not currently selected(used). Invokes Peak Status window so user to select voxel status: Below Min Intensity, Above Max Intensity, Overflow, Underflow, Invalid Peak, No Peak, and Multiple Highlights	Status Toolbar	Allows Status Toolbar to be displayed below GUI. Contains only GMT							
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[Window] (Menu appears only when scan bin files being viewed)	<table border="1"> <tr> <td>Cascade</td><td>Cascades all currently opened scan bin files</td></tr> <tr> <td>Tile Vertically</td><td>Will 'vertically tile' all opened scan bin files. User can scroll up,down with vertical,horizontal slide bars</td></tr> <tr> <td>Tile Horizontally</td><td>Will 'horizontally tile' all opened scan bin files. User can scroll up with vertical slide bar</td></tr> <tr> <td>Arrange Icons</td><td>If multiple windows open and minimized in display area, will align minimized files</td></tr> </table>	Cascade	Cascades all currently opened scan bin files	Tile Vertically	Will 'vertically tile' all opened scan bin files. User can scroll up,down with vertical,horizontal slide bars	Tile Horizontally	Will 'horizontally tile' all opened scan bin files. User can scroll up with vertical slide bar	Arrange Icons	If multiple windows open and minimized in display area, will align minimized files											
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Arrange Icons	If multiple windows open and minimized in display area, will align minimized files																			
[Help]	About Displays window w/software-specific information; i.e., version of release.																			
Zoom Toolbar	<table border="1"> <tr> <td>Fit 1:1</td><td>If displayed scan bin file has been zoomed in(out), button allows user to fit image to display area</td></tr> <tr> <td>Magnifier w/+ Sign</td><td>Zoom in button</td></tr> <tr> <td>Magnifier w/- Sign</td><td>Zoom out button</td></tr> <tr> <td>Magnifier in box</td><td>Allows user to select a box on display to zoom in on. Mouse arrow will change to magnifier. User will outline area w/two mouse clicks and view is fitted in display area</td></tr> <tr> <td>Zoom Percentage Menu</td><td>Allows user to zoom in(out) according percentage displayed. Selectable percentages: 25%, 50%, 75%, 100%, 150%, 200%, 300%, 400%, Fit to Window</td></tr> </table>	Fit 1:1	If displayed scan bin file has been zoomed in(out), button allows user to fit image to display area	Magnifier w/+ Sign	Zoom in button	Magnifier w/- Sign	Zoom out button	Magnifier in box	Allows user to select a box on display to zoom in on. Mouse arrow will change to magnifier. User will outline area w/two mouse clicks and view is fitted in display area	Zoom Percentage Menu	Allows user to zoom in(out) according percentage displayed. Selectable percentages: 25%, 50%, 75%, 100%, 150%, 200%, 300%, 400%, Fit to Window									
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Zoom Percentage Menu	Allows user to zoom in(out) according percentage displayed. Selectable percentages: 25%, 50%, 75%, 100%, 150%, 200%, 300%, 400%, Fit to Window																			
2	Database	Displays current database and its path. Default is "c:\lcs\config\lcs.doc"																		
3	File	Displays name of current file being saved on LCC hard drive during scan. Will display last scan file name when no scan in progress																		
4	Scanning Page [Detailed Area Scan, Continuous Line Scan, Quick View Scan] (One of two pages which allows user to select scan from one of three drop-down menus and execute each type of scan)	<table border="1"> <tr> <td>[Detailed Area Scan]</td><td>Detailed Area Scan</td><td>Drop-down menu allows user to select one out of a possible 30 detailed area scans</td></tr> <tr> <td></td><td>Start Area Scan</td><td>Executes detailed area scan selected from drop-down menu</td></tr> <tr> <td>[Continuous Line Scan]</td><td>Detailed Area Scan</td><td>Drop-down menu allows user to select one out of a possible 30 continuous line scans</td></tr> <tr> <td></td><td>Start Line Scan</td><td>Executes continuous line scan selected from drop-down menu</td></tr> <tr> <td>[Quick View Scan]</td><td>Detailed Area Scan</td><td>Drop-down menu allows user to select one out of a possible 10 quick-view scans</td></tr> <tr> <td></td><td>Start Quick View</td><td>Executes quick-view scan selected from drop-down menu</td></tr> </table>	[Detailed Area Scan]	Detailed Area Scan	Drop-down menu allows user to select one out of a possible 30 detailed area scans		Start Area Scan	Executes detailed area scan selected from drop-down menu	[Continuous Line Scan]	Detailed Area Scan	Drop-down menu allows user to select one out of a possible 30 continuous line scans		Start Line Scan	Executes continuous line scan selected from drop-down menu	[Quick View Scan]	Detailed Area Scan	Drop-down menu allows user to select one out of a possible 10 quick-view scans		Start Quick View	Executes quick-view scan selected from drop-down menu
[Detailed Area Scan]	Detailed Area Scan	Drop-down menu allows user to select one out of a possible 30 detailed area scans																		
	Start Area Scan	Executes detailed area scan selected from drop-down menu																		
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	Start Line Scan	Executes continuous line scan selected from drop-down menu																		
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	Start Quick View	Executes quick-view scan selected from drop-down menu																		

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### LCC SOFTWARE GUI (Continued)



## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### LCC SOFTWARE GUI (Concluded)

5	System Data Page [Temperature (degC), Electrical] (One of two pages. Gives user insight into various temp,elec values of components inside LCH. Values are software FDA'd according to limits set in current database. An out of allowable limit value is backlit in yellow and cause a msg to be displayed)	
	[Temperature]	Displays LCH component temp values in deg Celsius
6	[Electrical]	
	Displays LCH component elec values. Values are milliWatts, millamps, and Volts	
6	Laser On/Off [Laser On, Laser Off, Laser ?] (Displays on/off status of Laser diode)	
	Laser On (Green)	Scan in progress. Backlit in green while laser diode on
6	Laser Off (Blue)	Scan not in progress. Backlit in blue while laser diode off
	Laser ? (Gray)	No insight into LCH. Backlit in gray when no LCH to LCC Ethernet connectivity
6	Comm	Light displays Ethernet communication state between LCC,LCH Green Light – Indicates good Ethernet connection Yellow Light – Indicates bad Ethernet connection
	Temp	
6	Temp (Green/Yellow)	Light displays temp status of LCH components Green Light – Backlit in green when all LCH component temp values within ranges specified by current database Yellow Light – Backlit in yellow when one or more values out of limits
	Elec	
6	Elec (Green/Yellow)	Light displays elec status of LCH components Green Light – Backlit in green when all elec values within ranges specified by current database Yellow Light – Backlit in yellow when one or more values out of limits
	Scan Status (Blank, Complete, Vertical Resolution)	
7	Blank	When LCS software launched and no scans have been executed
	Complete	Displays last scan line collected or Stop Scan button selected
	Vertical Resolution	While scan in progress, field displays vertical resolution of scan and current line being scanned; i.e., 211/512 means current line being scanned and recorded on LCC is 211 and vertical resolution is 512
7	Message Area	
	GMT	Displays GMT of time tagged off-nominal message
	Message	Displays text description of error messages. Any messages displayed here are logged into system log
	MSG ID	Display unique six-digit number that corresponds to error message that appears in message area
	CLR	Clears current error messages displayed in message area. Button will invoke a dialogue box asking user if he wants to clear message area
	GMT DDD:HH:MM:SS	Displays GMT based on A31p system clock. Once GMT set via Tools menu, LCC will sync up to time kept on LCH, which is accurate

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### IDC SPECIFICATIONS

IDC DIMENSIONS: 6 in (L), 5 in (W), 2 in (D)

IDC ELECTRONIC COMPONENTS: Adimec-2000m/S and Pleora i-port PT1000-CL

IDC ELECTRONIC PWR: 12V conditioned pwr from LCH

HEATER PWR MODES/SOURCES:

OBSS State	Pwr	Source
RMS Grappled	124V	APCU1 (SSP1 APCU1 CONV and OUTPUT RLY sws)
MPM Berthed	28V	MNA and MNB (Pnl A8 STBD HTRS A,B sws) (only heater pwr in this mode)

IMAGER MODEL: Adimec-2000m/S gray-scale imager

CCD: 1920 x 1080

CCD PIXEL SIZE: 7.4 microns (square pixels)

SPECTRAL RESPONSE:

350 nanometers (25%)

500 nanometers (42% Peak)

700 nanometers (20%)

FOCAL LENGTH: 50mm

DYNAMIC RANGE: 60dB

GAIN: 1X-8X

APERTURE: f/8

FOCUS DISTANCE: 6 ft 3 in

WORKING DISTANCE: 5 ft

Target Resolution at 5 ft: 113 pixels/in

Horizontal Coverage at 5 ft: 17 in

Vertical Coverage at 5 ft: 10 in

INTERFACE: 10Base2 half duplex

CREW CONTROL:

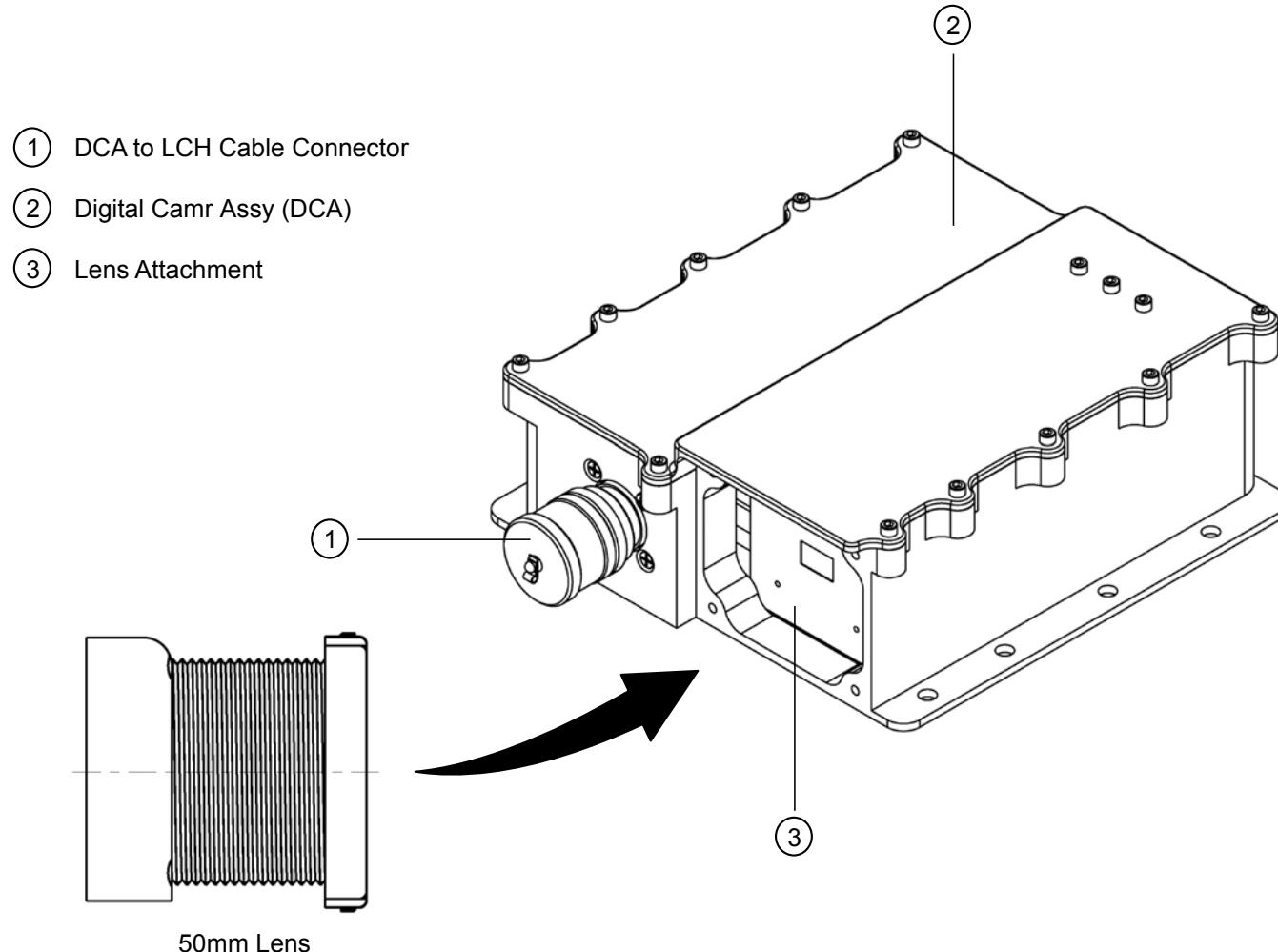
Hardware – LCC (Laser Camr Controller – A31p)

Software – LCC software shortcut (Shuttle Apps\IDC)

IMAGE FORMAT: 16-bit tif

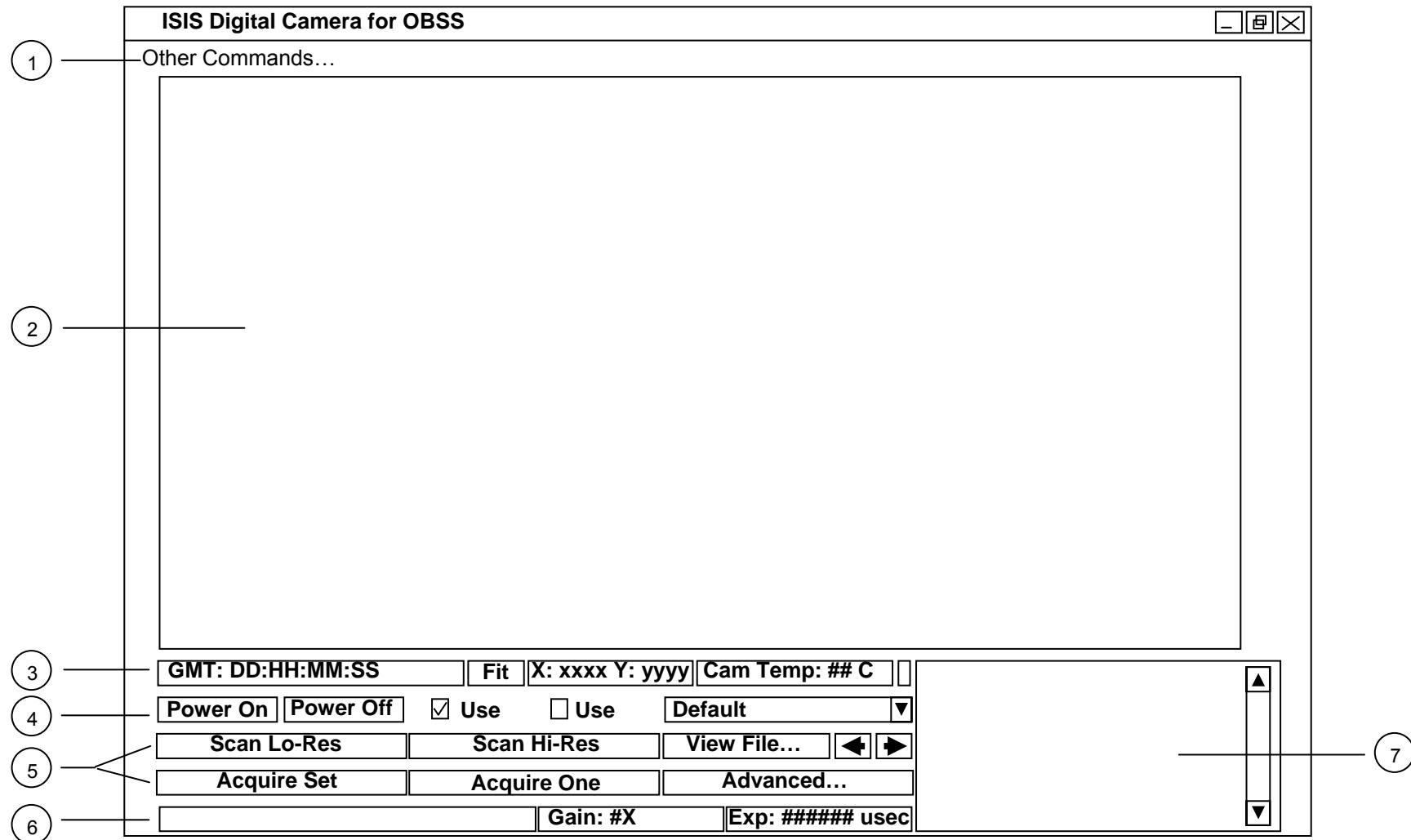
## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### IDC NOMENCLATURE



## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### IDC SOFTWARE GUI



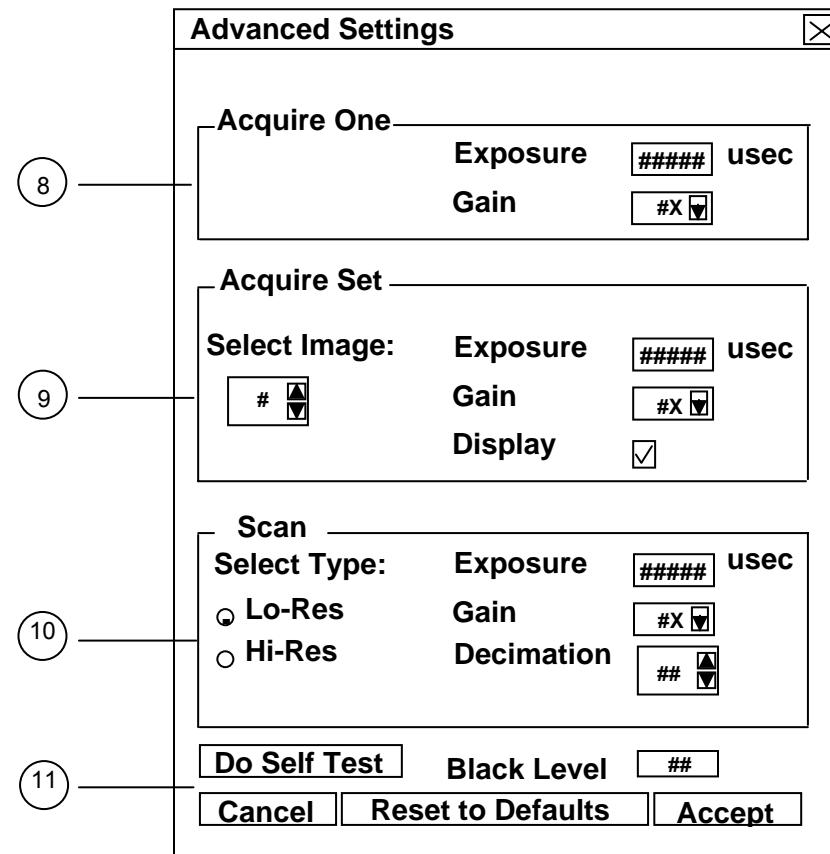
# LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

## IDC SOFTWARE GUI (Continued)

1	Other Commands (Pulldown menu provides other commands w/hot keys)	
	[F2]	Clear text in text window
	[F4]	Append text to an image
	[F5]	Toggle Summary View
	[F6]	Toggle Image Mode
	[F7]	Zoom In
	[F8]	Zoom Out
	[F9]	Reset Brightness and Contrast
	[F10]	Reset Auto Exposure Aperture to Default
	[F11]	Toggle Auto Exposure Aperture Visibility
	[F12]	Find Auto Exposure Aperture
2	Display Area	Shows the tiff or last image collected
3	Status Bar 1	
	GMT	Displays current time
	Zoom Level	Fit, 1X, 2X, 4X, 8X
	Mouse Position	Shows "X,Y" positions of mouse
	Camr Temperature	Temperature of Camr in Celsius
	Comm Status Light	Blinking green light when in nominal case; static while imaging
4	Power On/Off, Auto Exposure (AE), Color Coded (CC), Scenario File Drop List/Brightness and Contrast Controls]	
	[Power On]/[Power Off]	Buttons control the pwr to the IDC
	[Use AE]	Allows selection of auto-exposure capability
	[Use CC]	Allows user to color code the over and under exposed areas of image
	Scenario File Drop List	Drop down list allows user to select Gain and Exposure settings for all image acquisition buttons that depend upon light scenario
	Brightness and Contrast	When user switches into "Image Mode", scenario drop down list turns into "Brightness and Contrast" controls, allowing user to manipulate viewable image Note: Brightness and Contrast has no control over Camr brightness or contrast
5	Image Command Area	
	Image Acquisition Buttons	(Each button may be accessed during another operation to switch acquisition types quickly. Allows user to set scene with "Scan Lo-Res" and then immediately select "Scan Hi-Res", "Acquire Set" or "Acquire One" as needed without extra action)
	Scan Lo-Res	Image(s) not saved to disk. Displays decimated Camr view. Used to set software exposure and situational awareness
	Scan Hi-Res	Continuously saves full images to disk
	Acquire Set	Image(s) saved to disk. Acquires bracket set of images
	Acquire One	Image saved to disk. Acquires one image with no exposure control from AE
	View and Save Files	Allows user to select a file from a directory to view or (when holding "CTRL" key while clicking on "Save File To..." button) select a directory indicating where subsequent images will be saved. Green arrows allow user to quickly browse thru images alphabetically
	Advanced Command	Button brings up an Advanced Settings dialog box in which user may apply specific setting for individual image acquisition options. See pg 21-12
6	Status Bar 2	Contains status of current operation, gain and exposure settings for image being displayed, Status Bar Error Advisory, Status Error Strings, and Normal Operation Strings
7	Comment Area	Provides an entry form to input comments before image acquisition or append comments into a stored image. Note: Previous comments cannot be discarded

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### IDC SOFTWARE GUI (Continued)



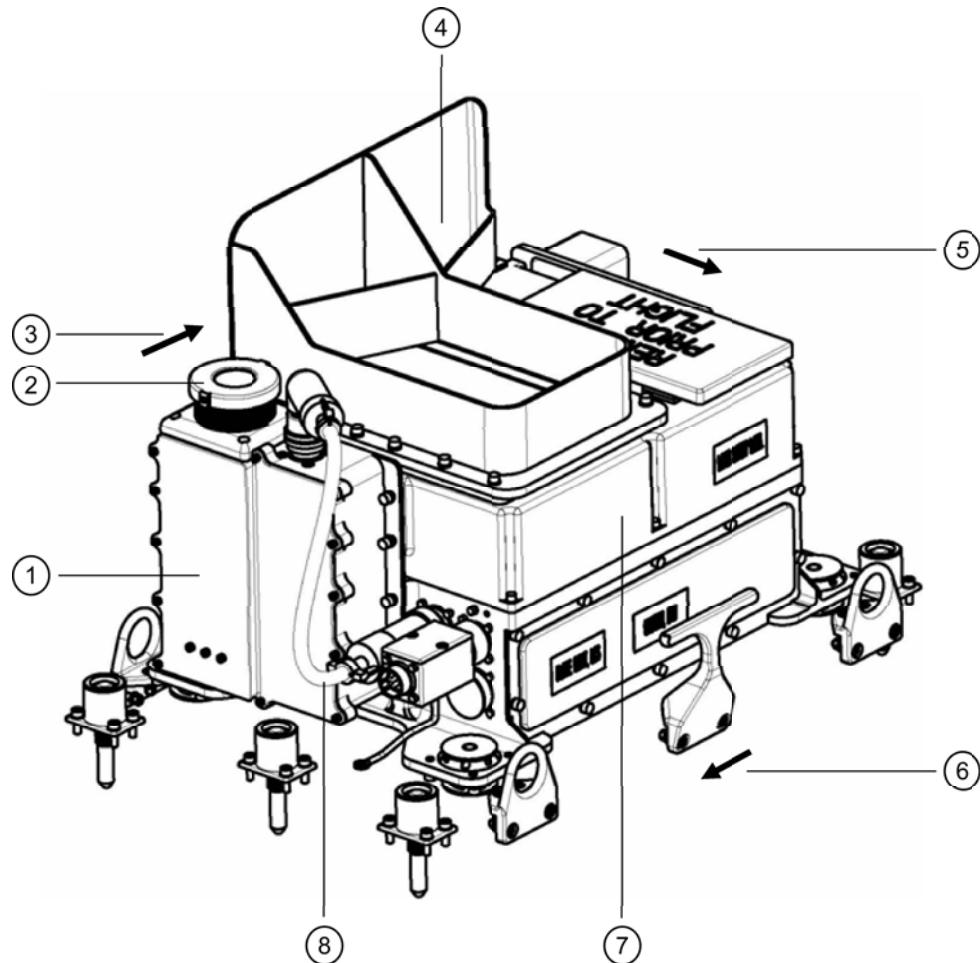
## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### IDC SOFTWARE GUI (Concluded)

8	<p>"Acquire One" Settings (Allows user to set exposure and gain settings for "Acquire One" cmd which acquires a single image from Camr)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">[Exposure]</td><td style="padding: 2px;">User may set exposure from 25 usec to 80025 usec</td></tr> <tr> <td style="padding: 2px;">[Gain]</td><td style="padding: 2px;">User may set Gain from 1X to 8X</td></tr> </table>	[Exposure]	User may set exposure from 25 usec to 80025 usec	[Gain]	User may set Gain from 1X to 8X				
[Exposure]	User may set exposure from 25 usec to 80025 usec								
[Gain]	User may set Gain from 1X to 8X								
9	<p>"Acquire Set" Settings (user to set exposure and gain settings for "Acquire Set" cmd. Each image acquired in set can have a different setting for exposure and gain. [Display] checkbox will determine if image is to be displayed when acquired)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">[Select Image]</td><td style="padding: 2px;">As a default, user may select up to 7 images</td></tr> <tr> <td style="padding: 2px;">[Exposure]</td><td style="padding: 2px;">User may set exposure from 25 usec to 80025 usec</td></tr> <tr> <td style="padding: 2px;">[Gain]</td><td style="padding: 2px;">User may set Gain from 1X to 8X</td></tr> <tr> <td style="padding: 2px;">[Display] Checkbox</td><td style="padding: 2px;">Selecting checkbox displays each acquired image as it is taken. If unchecked, no images are displayed, only saved. In each case, user will watch acquiring image set status bar count up each acquired image</td></tr> </table>	[Select Image]	As a default, user may select up to 7 images	[Exposure]	User may set exposure from 25 usec to 80025 usec	[Gain]	User may set Gain from 1X to 8X	[Display] Checkbox	Selecting checkbox displays each acquired image as it is taken. If unchecked, no images are displayed, only saved. In each case, user will watch acquiring image set status bar count up each acquired image
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[Display] Checkbox	Selecting checkbox displays each acquired image as it is taken. If unchecked, no images are displayed, only saved. In each case, user will watch acquiring image set status bar count up each acquired image								
10	<p>"Scan" Settings (Allows user to exposure, gain, and decimation settings for low/high resolution continuous scans)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">[Lo-Res]/[Hi-Res] Buttons</td><td style="padding: 2px;">User selects which scan to set attributes to: Lo-Res – Scans are displayed only and not saved to disk Hi-Res – Scans are displayed and saved to disk</td></tr> <tr> <td style="padding: 2px;">[Exposure]</td><td style="padding: 2px;">User may set exposure from 25 usec to 80025 usec</td></tr> <tr> <td style="padding: 2px;">[Gain]</td><td style="padding: 2px;">User may set Gain from 1X to 8X</td></tr> <tr> <td style="padding: 2px;">[Decimation]</td><td style="padding: 2px;">User may select a decimation level between 1-16. When decimation is a high number, time for image to be displayed on screen is faster due to smaller size and lower quality of image</td></tr> </table>	[Lo-Res]/[Hi-Res] Buttons	User selects which scan to set attributes to: Lo-Res – Scans are displayed only and not saved to disk Hi-Res – Scans are displayed and saved to disk	[Exposure]	User may set exposure from 25 usec to 80025 usec	[Gain]	User may set Gain from 1X to 8X	[Decimation]	User may select a decimation level between 1-16. When decimation is a high number, time for image to be displayed on screen is faster due to smaller size and lower quality of image
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[Gain]	User may set Gain from 1X to 8X								
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11	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">"Do Self Test" Command</td><td style="padding: 2px;">Queries IDC for an image test pattern which is then displayed on main display window. Test image is also stored to disk</td></tr> <tr> <td style="padding: 2px;">"Black Level" Input Box</td><td style="padding: 2px;">Sets Cam's "Black Level" threshold for all acquired images. Can be set from 0 to 4095</td></tr> <tr> <td style="padding: 2px;">"Reset to Defaults" Command</td><td style="padding: 2px;">Restores application defaults applied at startup to all settings. Holding CTRL and pressing "Reset to Defaults" will restore project defaults established in DCCS.ini file</td></tr> </table>	"Do Self Test" Command	Queries IDC for an image test pattern which is then displayed on main display window. Test image is also stored to disk	"Black Level" Input Box	Sets Cam's "Black Level" threshold for all acquired images. Can be set from 0 to 4095	"Reset to Defaults" Command	Restores application defaults applied at startup to all settings. Holding CTRL and pressing "Reset to Defaults" will restore project defaults established in DCCS.ini file		
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## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

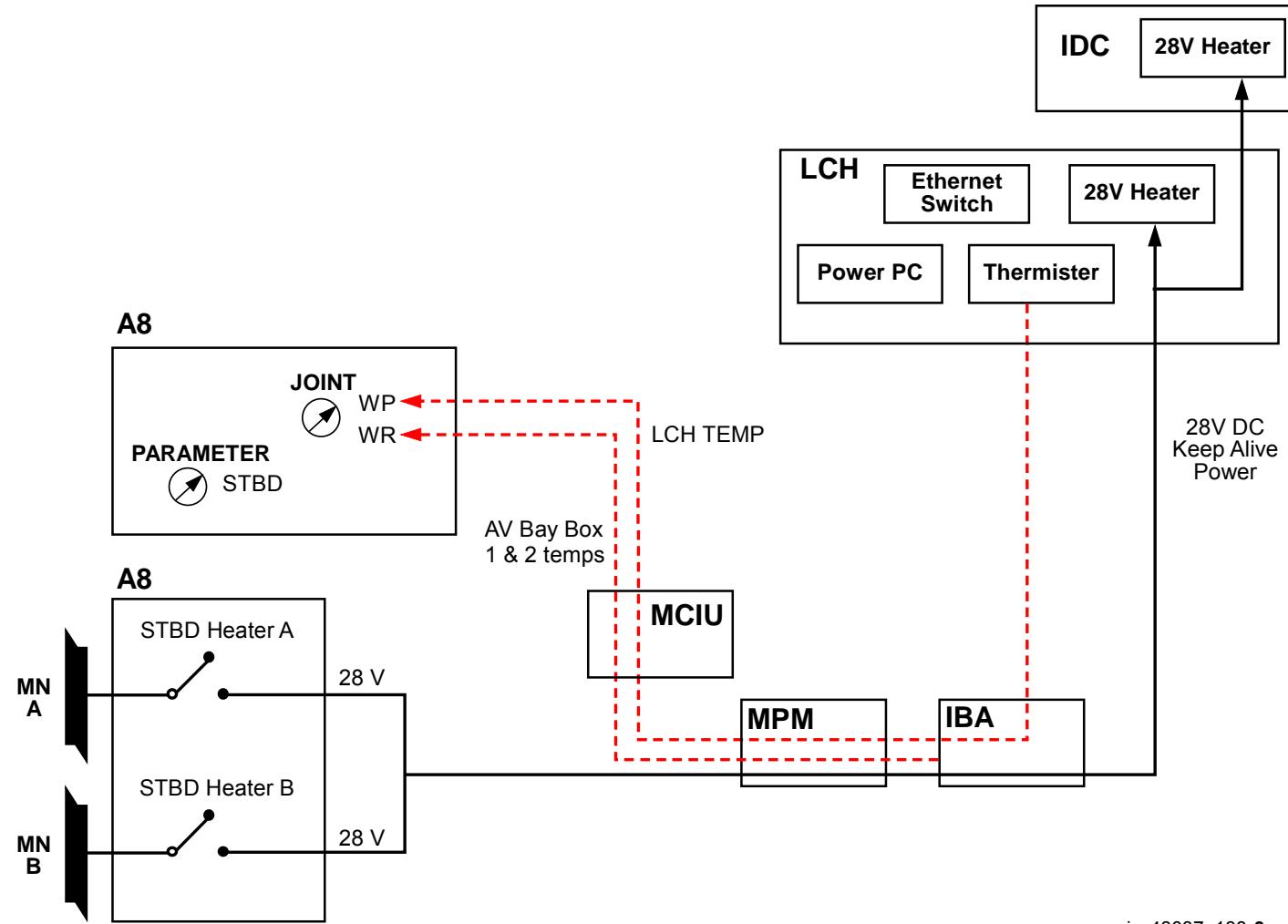
### LCS/IDC COMBINED NOMENCLATURE



- ① ISIS Digital Camr (IDC)
- ② 50mm Lens
- ③ Top View (from IDC perspective)
- ④ LCH Radiator
- ⑤ Top View (from LCH scan perspective)
- ⑥ Towards OBSS Grapple Fixtures
- ⑦ Laser Camr Head (LCH)
- ⑧ Laser Camr Head (LCH) to Digital Camr Assy (DCA) Cable

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

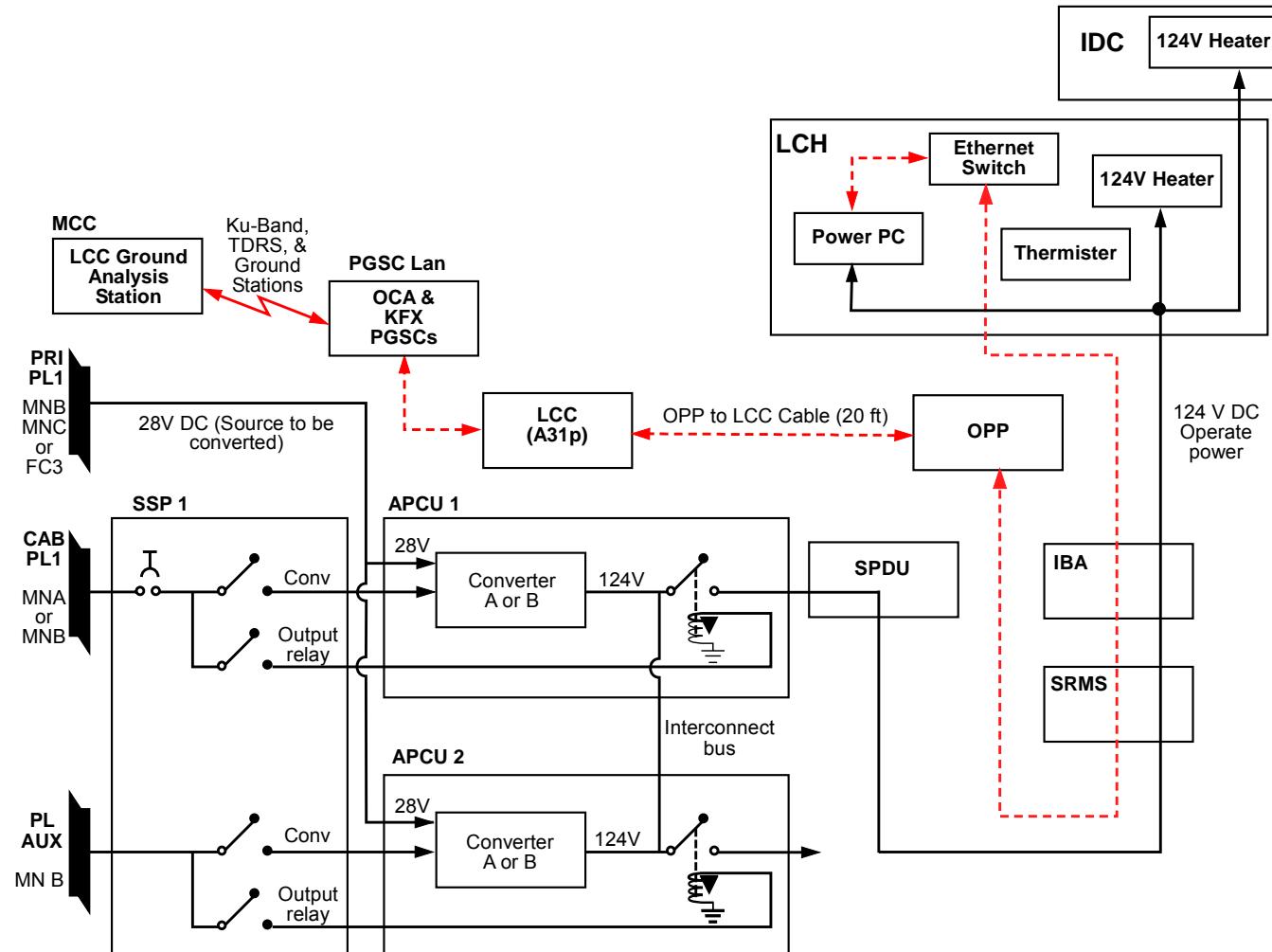
### LCS/IDC KEEP ALIVE PWR AND DATA INTERFACES (Berthed on MPMs)



jsc48037\_138r3.csv

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### LCS/IDC (HEATER ONLY MODE)/(OPERATIONAL PWR MODE) DATA AND PWR INTERFACES



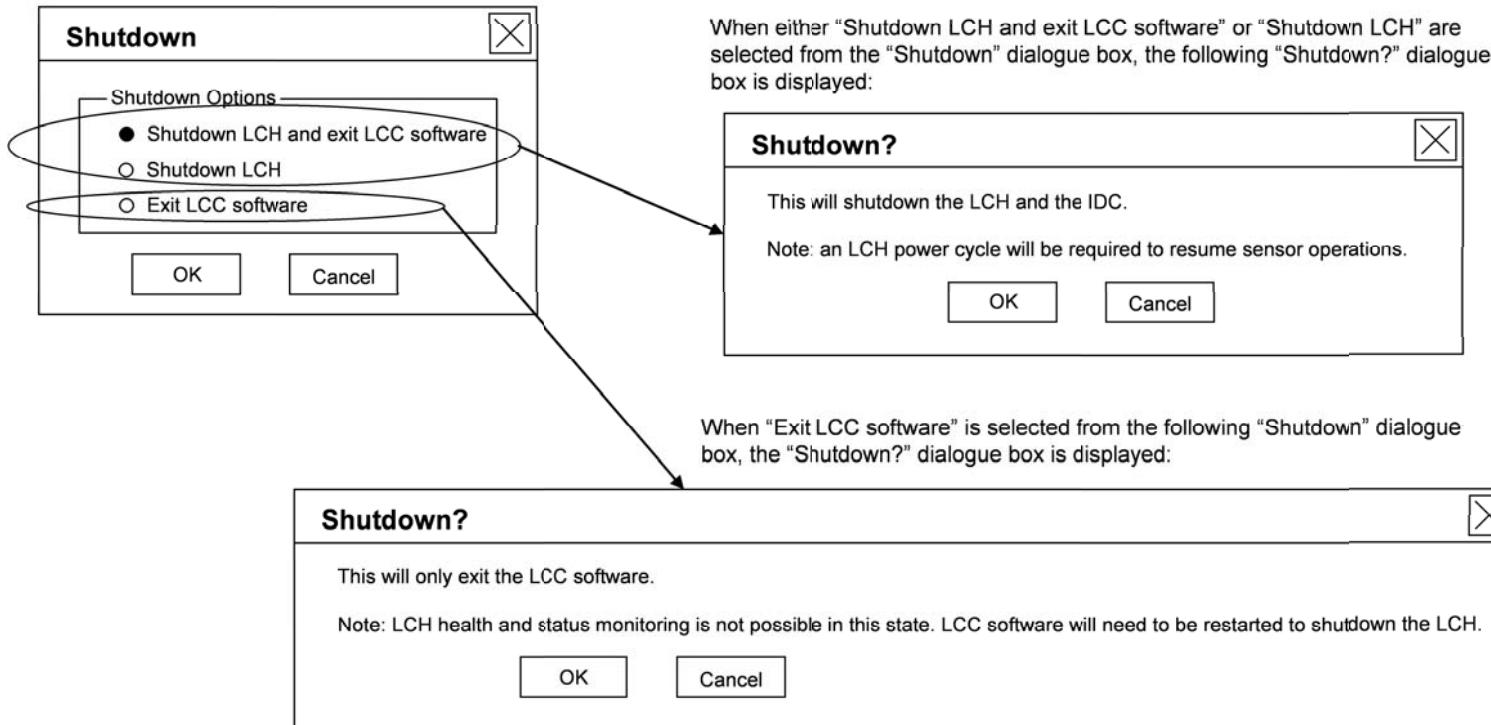
jsc48037\_134r2.csv

# LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

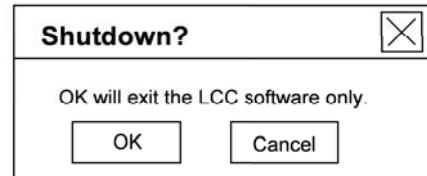
## LCC SOFTWARE EXIT DIALOGUE BOXES

### LCC Software Exit Dialogue Boxes

Case 1 : Selecting "File" and choosing "Exit" with a green Comm light.



Case 2 : Selecting "File" and choosing "Exit" with a yellow Comm light



## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### MANUAL A31p DESKTOP DNLK SETUP

#### NOTE

For desktop dnlk config to work correctly, ensure there is a load on A31p Video Out port (video coming out of laptop into pwrD input, such as AVIU(V10))

- |               |   |
|---------------|---|
| MO58F<br>AVIU | 1. √Video destination properly configured per LCC ACTIVATION, step 1 (Cue Card, <u>LCS</u> ) and pwrD<br>√TV PWR – ON<br>√HI/LO – LO  |
| A31p          | 2. <u>Desktop</u><br>Right click<br>Sel 'Properties'<br><br>3. <u>'Display Properties' Dialog Box</u><br>Sel 'Settings'<br>√Screen Area – 1024 x 768<br>If not 1024 x 768:<br>Move Screen Area sidebar to 1024 x 768<br>Sel 'Apply'<br>When second 'Display Properties' dialog box opens:<br>Sel 'OK'<br>When 'Monitor Settings' dialog box opens:<br>Sel 'Yes'<br><br>4. <u>'Display Properties' Dialog Box</u><br>Sel 'Advanced'<br><br>5. <u>'(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box</u><br>Sel 'Displays' |

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### MANUAL A31p DESKTOP DNLK SETUP (Continued)

MO58F  
AVIU

6. √TV display tab  
If Green tab:
  - | Go to step 7If Red tab:
  - | Click Red tab. Tab automatically turns green after selection (see fig 21-1)
  - | Go to step 7If Gray tab:
  - | Sel 'Cancel' (closes '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box)
  - | √Video Destination connection
    - | If not connected:
      - | Configure per LCC ACTIVATION, step 1 (LCS, Cue Card)
      - | √TV PWR – ON
      - | √HI/LO – LO
      - | Repeat steps 4-6
    - | If connected:
      - | √Connection secure
      - | Repeat steps 4-6
  - | If tab still Gray: √MCC

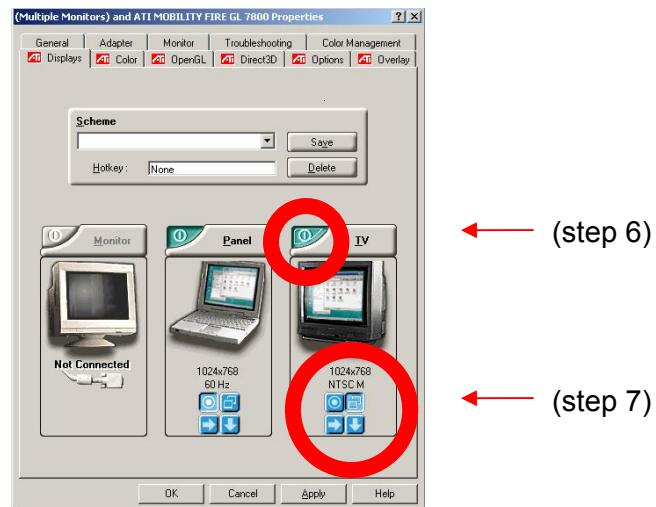


Figure 21-1.- Video Output

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

### MANUAL A31p DESKTOP DNLK SETUP (Concluded)

7. ✓Blue double box (  ) on TV display highlighted (see fig 21-1)

If Blue double box highlighted:

    Sel 'OK'

    Go to step 9

If Blue double box not highlighted:

    Sel double box (  )

    Sel 'OK'

8. ATI Property Page

    Sel 'Yes'

9. 'Display Properties' Dialog Box

    Sel 'OK'

### RECONFIGURATION OF A31p SCREEN RESOLUTION

#### NOTE

Following steps will disable auto reconfiguration that automatically ships video. Capture Card will need to be manually configured using MANUAL A31p USING DESKTOP DNLK SETUP procedure, 21-18 for desktop dnlk ops

A31p

1. Desktop

    Right click

    Sel 'Properties'

2. 'Display Properties' Dialog Box

    Sel 'Settings'

    Sel 'Advanced'

3. '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box

    Sel 'Displays'

## LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Concluded)

### RECONFIGURATION OF A31p SCREEN RESOLUTION (Concluded)

4. √TV display tab  
If Red(Gray) tab:  
| Go to step 5  
If Green tab:  
Click Green tab. Tab automatically turns red after selection (see fig 21-1)  
Sel 'Apply'
5. 'ATI Property Page' Dialog Box  
Sel 'Yes'
6. '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box  
Sel 'OK'
7. 'Display Properties' Dialog Box  
Sel 'OK'
8. Desktop  
Right Click  
Sel 'Properties'
9. 'Display Properties' Dialog Box  
Sel 'Settings'  
Move Screen Area sidebar to 1600 x 1200  
√Colors – True Color (32 bit)  
If not, sel True Color (32 bit) from drop down menu  
Sel 'Apply'  
When 'Display Properties' dialog box opens:  
Sel 'OK'  
When 'Monitor Settings' dialog box opens:  
Sel 'Yes' (within 15 sec)  
If 15 sec window missed:  
Repeat step 9  
When 'Display Properties' dialog box opens:  
Sel 'OK'

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## BATTS & FUSES

### PAGE

DCS BATT CHARGING.....	22-2
CC BATT CHARGING .....	22-3
BATT/FUSE REFERENCE.....	22-4

## BATTS & FUSES

### BATTS & FUSES

#### DCS BATT CHARGING

1. Config H/W per dwg below (DCS 760 Pwr Cable reqd for direct Camr pwr)

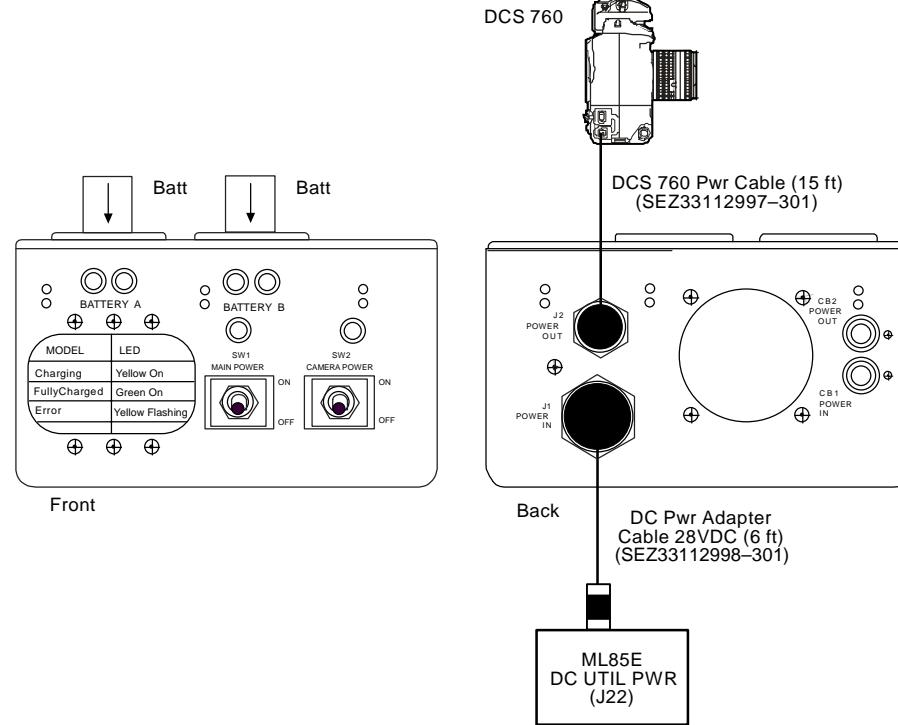
ML85E      2. √cb DC 10 AMP MNB CB4 – cl  
                √DC 10 AMP MNB S4 – ON

Batt Chgr    3. √cb PWR IN (CB1) – cl  
  
                4. MAIN PWR – ON (LED on)

5. If Direct Camr Pwr:  
    √cb PWR OUT (CB2) – cl  
    CAMERA PWR – ON (LED on)
6. Insert Batt(s),check charger LEDs for charge status (~2hr)

#### NOTE

Green It (~45 min) = 80% charge. For full charge, leave batts for additional 2 hr.  
OK to leave batts in charger longer

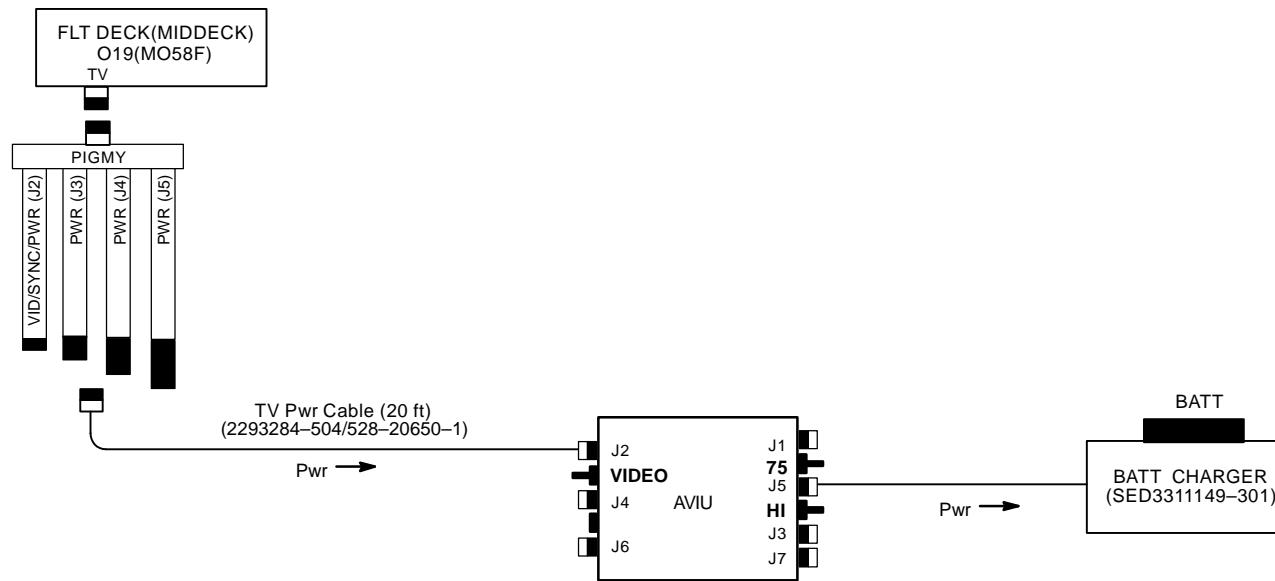


jsc48037\_092r1.csv

## BATTS & FUSES (Continued)

### CC BATT CHARGING

1. Config H/W per dwg below
- |                |  |
|----------------|--|
| AVIU           | 2. SYNC/VIDEO – VIDEO<br>HI-Z/75 – 75<br>PWR SELECT – HI   |
| O19<br>(MO58F) | <p><b>NOTE</b><br/>When batt charger not in use, remove pwr</p> <p>3. √TV PWR – ON</p> <p>4. Insert Batt in charger. Check charger LED for charge status (~2 hr)</p> |



jsc48037\_093.cnv

## BATTS & FUSES (Concluded)

### BATT/FUSE REFERENCE

ITEM	BATTERY	SAME AS:	FUSE	SAME AS:
AVIU	NONE	N/A	2A	CCPI
BINOCULARS – 14 X40 GYRO – 10 X40 GYRO	AA (6)	AA	NONE	N/A
BPSMU	18V (two 9V)	NONE	NONE	N/A
CAMCORDER – PD100	Li-ION	RECORDER – V10	NONE	N/A
CC Batt Charger	N/A	N/A	3A	
CCPI	NONE	N/A	2A (2), 4A, 8A	SPARE CCPI FUSE KIT AVIU
DCS 760	NiMH (RECHARGEABLE)	NONE	N/A	N/A
DCS Batt Charger	N/A	N/A	CB	N/A
HISL	NONE	N/A	5A	NONE
LAVALIER MIC	76 (1)	NONE	NONE	NONE
LCD MONITOR	AA (6)	AA	NONE	N/A
NIKON FLASH	AA (4)	AA	NONE	N/A
PHOTOFLOOD	NONE	N/A	1.7A	N/A
RECORDER – V10	Li-ION	RECORDER – V10	NONE	N/A
SEQUENTIAL STILL VIDEO ENCODER	N/A	N/A	2A	N/A
IFM FUSE KIT				
INSTRUMENT FUSES				
1/2 A(2)	5A (5)			
1A (5)	7.5A (2)			
2A (2)	10A (2)			
3A (5)				
BUS FUSES (1/4 X 1-1/4)				
		1/4A (2)	3A (2)	
		1/2A (2)	5A (5)	
		1A (2)	7.5A (2)	
		2A (2)	10A (2)	

## CUE CARD CONFIGURATION

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TV .....	CC 23-3
PLAYBACK.....	CC 23-5
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PLBD VTR RECORDING (NOT BEING FLOWN) .....	CC 23-12
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LCS.....	CC 23-16
IDC.....	CC 23-18
VIDEO SETUP.....	CC 23-20

## **CUE CARDS**

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TOP

## 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)

HOOK  
VELCRO

TV

## 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 MON 1(2) pb – push  
IN pb – As reqd
  - If CTVC:  
| ALC pb – push  
AVG pb – push
  - 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 – push  
DAY(NIGHT) pb – push  
ALC pb – push  
AVG pb – push
  - Repeat for other Camrs as reqd

### Dnlk Ops

- Coordinate dnlk and sync config w/MCC  
Config audio as reqd
- If analog, on MCC GO:  
| VID OUT DNLK pb – push  
| IN pb – As reqd
- If DTV, on MCC GO:  
| Cables connected  
| (MUX) MUX/VTR/CC PWR – on (LED on)  
| √MUX BYPASS – ACT
- (VIP) PWR – on (LED on, DATA FLOW LED flashes twice)  
ON/STANDBY – push (green LED on)
- (VTR) √INPUT display – VIDEO
- A7 VID OUT DTV pb – push  
IN pb – As reqd
- L10 (VIP) √DATA FLOW LED – on  
(MUX) √CHANNEL 3 DATA LED – on

## DEACTIVATION

- If illuminator ON:  
Refer to Illuminator Ops and perform Illuminator OFF
- A7 PORT RMS CAMR – WRIST  
TV CAMR PWR A(B,C,D,RMS) – OFF (tb-OFF), wait 10 sec  
PORT RMS CAMR – ELBOW  
TV CAMR PWR RMS – ON (tb-on), wait 10 sec, OFF (tb-off)
  - TV PWR CNTL – PNL  
CONTR UNIT – OFF  
CNTL – CMD
  - A3 MON 1,2 PWR – OFF
  - If DTV:  
L10 (VTR) ON/STANDBY – push (red LED on)  
(VIP) PWR – off (LED off)  
(MUX) MUX/VTR/CC PWR – off (LED off)  
VTR/CC PWR – off (LED 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 – push  
0(+12,+24) dB pb – push  
CAMR CMD IRIS – OP,CL

### Return to Auto Exposure

- ALC pb – push  
AVG pb – push

### MUX Ops

NOTE  
Although dnlk/rcl in color, MON  
will display MUX in B&W

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

For RSC Ops:  
Go to LDR/ITVC Cue Card

P/TV-1a/117/O/B

(reduced copy)

CC 23-3

P/TV/117/FIN

TOP  
BACK OF 'TV'

HOOK  
VELCRO

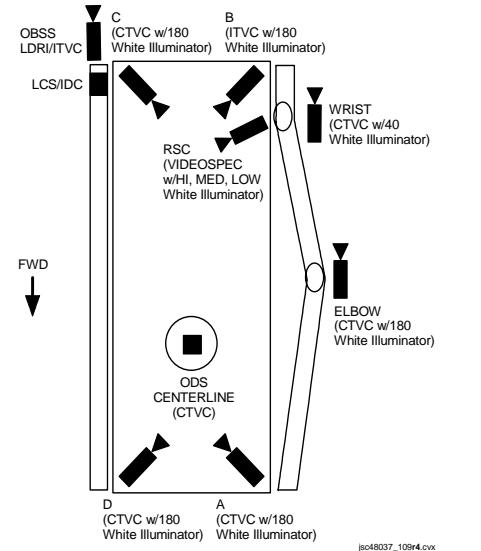
### Illuminator Ops

#### Illuminator ON

```
R14:D(E) | If Wrist Illuminator:  
|   \cb TV RMS CAMR CAMR/PTU - cl  
|     \WRIST ILLUM/CAMR HTR - cl  
|       - op, then cl  
  
| If Elbow Illuminator:  
|   \cb TV RMS CAMR CAMR/PTU - cl  
|     \ELB ILLUM/CAMR HTR - cl  
|       - op, then cl  
  
| If A(B,C,D) Illuminator:  
|   \cb TV A(B,C,D) CAMR CAMR/PTU - cl  
|     \ILLUM/PTU HTR - cl  
|       - op, then cl
```

#### Illuminator OFF

```
R14:D(E) | If Wrist Illuminator:  
|   cb TV RMS CAMR WRIST ILLUM/CAMR HTR - op, then cl  
| If Elbow Illuminator:  
|   cb TV RMS CAMR ELB ILLUM/CAMR HTR - op, then cl  
| If A(B,C,D) Illuminator:  
|   cb TV A(B,C,D) CAMR ILLUM/PTU HTR - op, then cl  
  
If RSC Illuminator:  
  Go to LDRI/ITVC Cue Card
```



P/TV-1b/117/O/B

(reduced copy)

CC 23-4

P/TV/117/FIN

TOP

## PLAYBACK

HOOK  
VELCRO

## ANALOG

## ACTIVATION

CC Setup per diagram (back of cue card)  
 A7 Perform ACTIVATION (Cue Card, **TV**), as reqd  
 O19(MO58F) √TV PWR – ON

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

CC PWR – VTR

## OPERATIONS

## PLBK or DNLK VIDEO

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

A7 VID OUT MON pb – as reqd  
 IN FLT DECK(MIDDECK) pb – push

CC VTR pb – REW(FF) to cue tape

**If Dnlk**  
 √MCC has commanded async config  
 √TV DNLK – ENA  
 VID OUT DNLK pb – push  
 IN FLT DECK(MIDDECK) pb – push

CC PLAY pb – push (green ▶ displayed)  
 If PLBK(DNLK) complete:  
 | STOP pb – push  
 If CC ops complete, go to DEACTIVATION

## DEACTIVATION

CC Remove, mark, stow tape as reqd  
 PWR – OFF  
 ATU Reconfig as desired  
 O19(MO58F) TV PWR – OFF, as reqd  
 Go to DEACTIVATION (Cue Card, **TV**), as reqd

## VTR VIA ANALOG

## ACTIVATION

Setup per diagram (back of cue card)  
 Disconnect CC Video input from AVIU J3  
 Perform ACTIVATION (Cue Card, **TV**) as reqd  
 √TV PWR – ON

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

L10 (MUX)  
 (VTR) √VTR/CC PWR – on (LED on)  
 √ON/STANDBY LED – green

## OPERATIONS

## ANALOG PLBK or DNLK VIDEO

L10 (VTR) Install tape if reqd  
 √DISPLAY SELECT - DATA

If audio reqd:  
 PWR – on (LED on, DATA FLOW LED flashes twice)  
 ATU – PBK/KEY MIC (Amber LED on)

(VIP) If MHA, COMM PWR – ON  
 PWR – AUD  
 Desired Loops – T/R  
 Other Loops – OFF  
 XMIT/ICOM Mode – VOX/VOX  
 VOX SENS – MAX

CCU ATU VID OUT Desired MON pb – push  
 IN FLT DECK pb – push  
 REW(FF),PLAY,PAUSE pb – push as reqd to cue tape

A7 VID OUT Desired MON pb – push  
 IN FLT DECK pb – push  
 REW(FF),PLAY,PAUSE pb – push as reqd to cue tape

L10 (VTR) **If Dnlk**  
 √MCC has commanded async config  
 √TV DNLK – ENA  
 VID OUT DNLK pb – push  
 IN FLT DECK pb – push

L10 (VTR) PLAY pb – push (green • displayed)  
 If PLBK(DNLK) complete:  
 | STOP pb – push  
 If VTR ops complete, go to DEACTIVATION

## DEACTIVATION

L10 (VTR) Remove, mark, stow tape as reqd  
 ON/STANDBY pb – push (red LED on)  
 PWR – off (LED off)  
 Reconfig as desired  
 TV PWR – OFF  
 Go to DEACTIVATION (Cue Card, **TV**) as reqd

## DIGITAL

## ACTIVATION

Setup per diagram (back of cue card)  
 L10 (MUX)  
 (VTR) √VTR/CC PWR – on (LED on)  
 √ON/STANDBY LED – green

## OPERATIONS

## PLBK or DNLK VIDEO

L10 (VTR) Install tape, if reqd  
 √DISPLAY SELECT - DATA

If Index Search reqd:  
 √ID – VTR4  
 SEARCH MODE pb – push (INDEX SEARCH mode displayed)  
 | ◀◀,(▶▶,) pb – push to move highlight bar to desired GMT start  
 When VTR auto-cue complete, green • displayed:  
 PAUSE pb – push  
 REW(FF),PLAY,PAUSE pb – push as reqd to cue tape

**If Dnlk**

L10 (MUX) MUX/VTR/CC PWR – on (LED on)  
 √MUX BYPASS – ACT  
 √CHANNEL 3 DATA LED – on

L10 (VTR) PLAY pb – push (green • displayed)  
 If PLBK(DNLK) complete:  
 | STOP pb – push  
 If VTR ops complete, go to DEACTIVATION

## DEACTIVATION

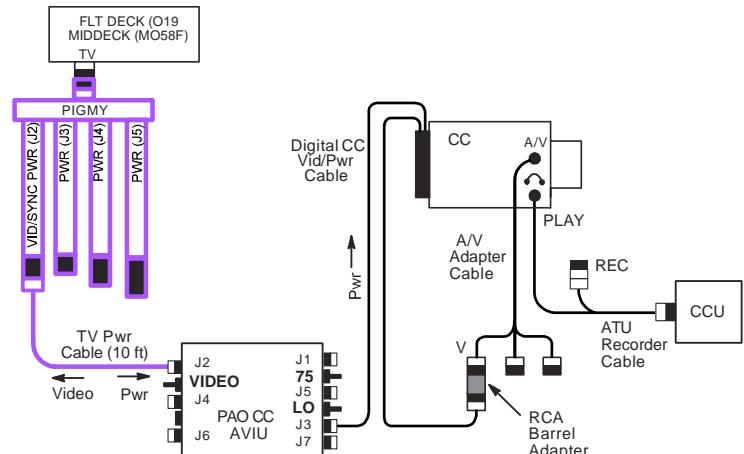
L10 (VTR) Remove, mark, stow tape as reqd  
 (MUX) ON/STANDBY pb – push (red LED on)  
 MUX/VTR/CC PWR – off (LED off)  
 VTR/CC PWR – OFF (LED off)  
 Go to DEACTIVATION (Cue Card, **TV**) as reqd

(reduced copy)

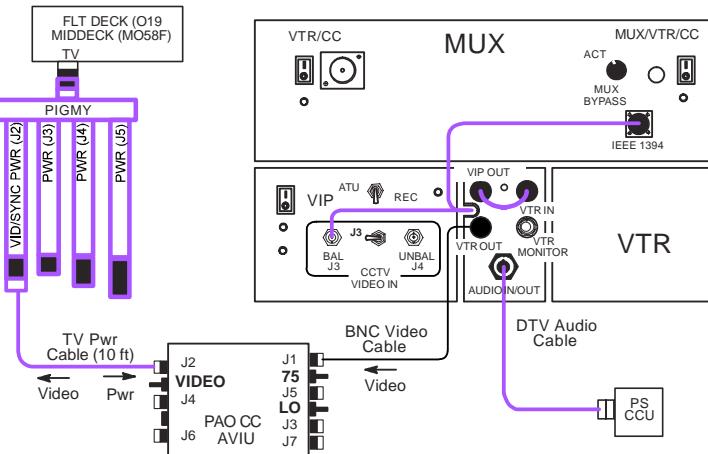
TOP  
BACK OF 'PLAYBACK'

HOOK  
VELCRO

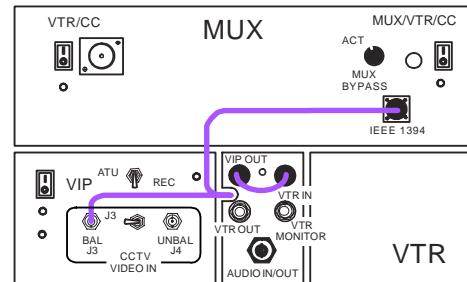
**ANALOG PLAYBACK**



**VTR VIA ANALOG PLAYBACK**



**DIGITAL PLAYBACK**



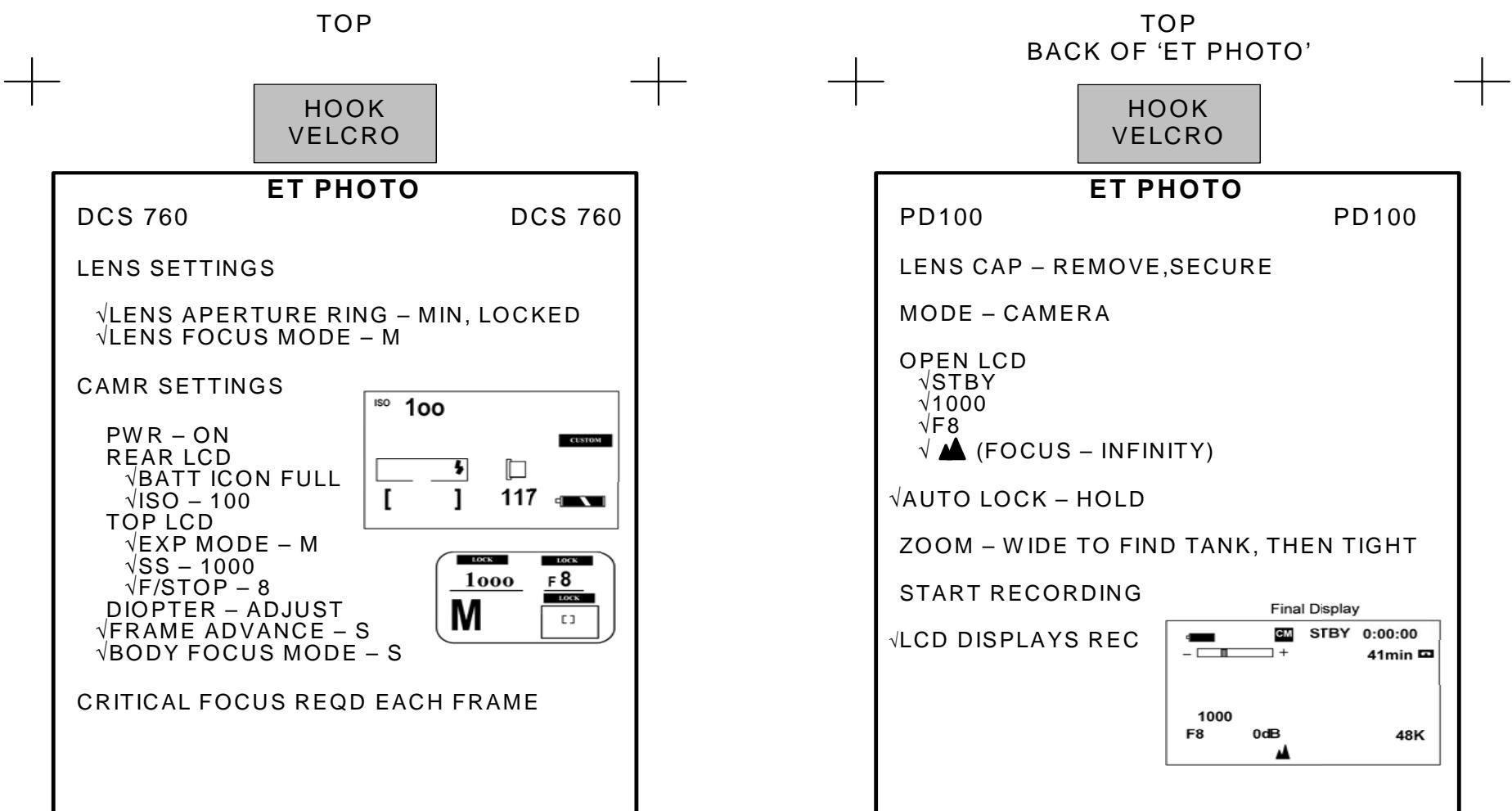
jsc48037\_117\_028cr1.csv

P/TV-2b/117/O/B

(reduced copy)

CC 23-6

P/TV/117/FIN



+

P/TV-3a/117/O/A

+

+

P/TV-3b/117/O/A

+

TOP

MEDIA ALLOCATIONS					
DCS	1gb/117 shots	DVCAM	3 hr/tape	MINI DVCAM	40 min/tape
TBD		TBD		TBD	

P/TV-4a/117/O/B

(reduced copy)

CC 23-8

P/TV/117/FIN

TOP  
BACK OF 'MEDIA ALLOCATIONS'

HOOK  
VELCRO

P/TV-4b/117/O/B

(reduced copy)

CC 23-9

P/TV/117/FIN

TOP

HOOK  
VELCRO

WVS

HOOK  
VELCRO

#### ADJUST BRIGHTNESS

##### Course Adjustment

PGSC Select Page – RF Camera  
Lens Iris Control – cl(op)

##### Fine Adjustment

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

#### DARK SUBJECT

PGSC Select Page – RF Camera  
√Advanced Controls displayed  
Automatic Gain Control – Enabled  
(Disabled preferred)

#### PWRDN

For all lens (three) on each RF Camera Assy:  
PGSC Lens Iris Control – Close until view black  
  
Sel RF Camr 1,2 – None (black "OFF")  
V10 √Test Pattern displayed (color bars w/"No WVS  
Video")  
PGSC Select Page – XCVR  
Transceiver 1(2) CMD Pwr – Off  
(black CMD PWR:LVL-"OFF:Min")  
Sel File → Exit  
  
V10 STOP pb – push  
Mark,stow tapes  
PWR – OFF  
  
A7 WIRELESS VID PWR – OFF  
HTR – OFF

#### CAMR ADJUSTMENTS

#### VIDEO SIGNAL PROBLEMS

For problem EMU TV:  
EMU EMU TV Pwr pb – push (no LED), wait 10 sec, push  
(green LED)

If no joy:

PGSC √Select Page – XCVR  
√Advanced Controls displayed  
For XCVR w/video problem: IF – Narrow

If still no joy:

A7 WIRELESS VID PWR – OFF, wait 10 sec, ON  
  
If still no joy:  
PGSC For XCVR w/video problem: IF – Wide  
For XCVR w/good video: Sel RF Camr – None (black 'OFF')  
If video acceptable, other EMU TV interfering w/signal  
Alternately sel EMU TVs to acquire video

If still no joy:

For XCVR with good video:  
Sel RF Camr – reselect original EVA crewmember  
For XCVR w/video problem: Antenna – Manual  
Sel desired antenna

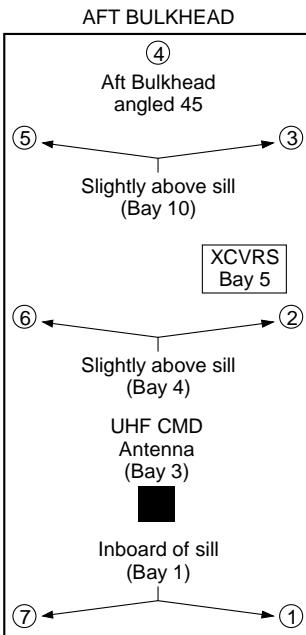
If still no joy:

For XCVR w/video problem: Antenna – Auto  
√MCC

#### COMMANDING PROBLEM (UHF)

If commanding of WVS not visually seen:  
PGSC Select Page – XCVR  
Sel Transceiver 2(1) CMD Pwr – On  
(green CMD PWR:LVL-"ON:Min")

#### ANTENNA LOCATIONS



jsc48037\_108r1.csv

P/TV-5a/117/O/A

(reduced copy)

CC 23-10

P/TV/117/FIN

TOP  
BACK OF 'WVS'

HOOK  
VELCRO

#### STATIC XCVR

##### **Condition: No comm between PGSC & PLB XCVR**

- PGSC 1. ✓Cable connections between WIB and PGSC  
A7 2. WIRELESS VID PWR – OFF, wait 10 sec, ON

If no joy:

- PGSC 3. Sel 'Start' > 'Shut Down' > 'Restart' > 'OK'  
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 pushed (green LED)

If no joy:

- PGSC 2. ✓Correct RF Camera selected via pulldown menu  
✓RF Camera (two) – ON (green "ON")  
If not ON:  
RF Camera (of static EMU TV) – sel "None" via pulldown menu, then sel original EMU TV

If still no joy:

3. RF Camera 1(2) – sel 'None'  
Perform CAMR ID ASSIGNMENT  
Reattempt RF Camr selections

If still no joy:

4. ✓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:

5. EMU TV Pwr pb (of static EMU TV) – push (no LED),  
wait 10 sec, push (green LED)

If still no joy:

6. ✓MCC

#### **ALERT MSG TROUBLESHOOTING**

##### BAD CAMERA ID

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

- PGSC 1. Select Page – XCVR  
Transceiver 1(2) CMD Power – On (green CMD PWR:LVL - "ON:Min")  
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

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

Camr ID Data		
Camr Address	16	17
Serial Number	1010	1011
Label	EV1	EV2

P/TV-5b/117/O/A

(reduced copy)

P/TV-6a/117/O/A  
(Front)

NOT BEING FLOWN

P/TV-6b/117/O/A  
(Back)

NOT BEING FLOWN

TOP

HOOK  
VELCRO

#### ACTIVATION

- Config CCTV Sys
  - A7 \ACTIVATION (Cue Card, TV) performed
  - L10 (MUX) \MUX/VTR/CC – on
  - \Cabling from VTR MONITOR port to DTV V10
  - R12 (VPU) \VPU Pwr – ON (LED on)
  - \Green Jumper – LDRI/ITVC
  - MON 1,2 L-DATA – ON
  - C-DATA – GRN
- Apply SPEE Pwr
  - A8L \STBD RMS HTR (two) – OFF
  - R12 (OPP) \cb OBSS SW PWR – cl
  - \OBSS SW PWR – ON
  - (OBSS) SPEE PWR – ON
  - A6U EVENT TIMER CNTL – STOP – RESET
  - EVENT TIMER CNTL – START (15 min LDRI calibration warmup)
- Config RSC Illum to HI
  - A7 VID OUT MON 1(2) pb – push
  - IN C pb – push
  - PAN/TILT – Adjust to see RSC Camr
  - R12 (OBSS) SPEE PWR – OFF, wait 10 sec, then ON
  - MON 1(2) \RSC illum on HI (three rings)
- Enable ITVC
  - R12 (OBSS) ITVC ENA – ON
  - A7 VID OUT DTV pb – push
  - IN PL 2(VPU) pb – push
  - If MAN GAIN pb not illuminated:  
ITVC ENA – OFF, wait 10 sec, then ON
  - Repeat until MAN GAIN pb illuminated
  - A7 LT LEVEL pb – push
  - DAY (NIGHT) pb – push
  - ALC pb – push
  - AVG pb – push
  - V10 \ITVC video displayed
- Verify LDRI Powered
  - A7 VID OUT MUX 1 L pb – push
  - IN MIDDECK pb – push
  - LDRI MODE 6 pb – push
  - V10 \Flickering LDRI w/rounded corners
  - A7 LDRI MODE 2 pb – push
  - V10 \ITVC video displayed
  - A7 VID OUT DTV pb – push, to return to ITVC control

#### LDRI/ITVC

#### GENERAL LDRI CONTROL

- A7 VID OUT MUX 1 L pb – push  
IN MIDDECK pb – push

##### Mode 1 (default at pwrup)

- A7 LDRI MODE 1 pb – push  
MON 2 \ITVC video displayed

##### Mode 2

- A7 LDRI MODE 2 pb – push  
MON 2 \ITVC video w/illum displayed

##### Modes 3 (4,5,6)

- A7 LDRI MODE 3(4,5,6) pb – push  
MON 2 \LDRI w/rounded corners displayed  
To adjust brightness:  
A7 CAMR CMD IRIS – OP,CL, as reqd

#### PAN/TILT OPS WITH LDRI ACTIVE

##### NOTE

When adjusting pan/tilt in Modes 3(4,5,6), ITVC FOCUS (ZOOM, IRIS) cntrs functional

- A7 VID OUT MON 2 pb – push  
IN PL2(VPU) pb – push  
CAMR CMD PAN,TILT – as reqd  
VID OUT MUX 1 L pb – push, to return to LDRI cntl

HOOK  
VELCRO

#### DEACTIVATION

- A7 VID OUT MUX 1 L pb – push  
\IN MIDDECK pb  
LDRI MODE 1 pb – push

- R12 (OBSS) ITVC ENA – OFF

- SPEE PWR – OFF  
A6U EVENT TIMER MODE – UP  
CNTL – START

#### LDRI MODE SUMMARY

##### Mode 1 – Standby

- ITVC video
- LDRI in standby

##### Mode 2 – Illuminator

- ITVC video w/illum
- LDRI laser active, LDRI camera inactive

##### Mode 3 – 2D

- LDRI 2D video
- Similar to ITVC video

##### Mode 4 – 2D Gamma

- LDRI 2D video w/Gamma Black Stretch
- Similar to ITVC video

##### Mode 5 – 3D

- LDRI 3D video
- Flicker on MON

##### Mode 6 – 3D Gamma

- LDRI 3D video w/Gamma Black Stretch
- Flicker on MON

(reduced copy)

TOP  
BACK OF 'LDRI/ITVC'

HOOK  
VELCRO

**RSC CAMR OPS**

NOTE  
Camr nominally pwrd in Block 4 of PI C/L

R12 (OPP)  
(OBSS) cb OBSS SW PWR CB1 – cl  
OBSS SW PWR – ON  
RSC PWR – ON

**RSC ILLUMINATOR OPS**

NOTE  
RSC illuminator OFF when SPEE PWR sw initially taken to ON. A cycle of the SPEE PWR sw takes RSC illuminator to HIGH. Subsequent pwr cycles take illuminator to MED, LOW, OFF and then back to HIGH. Config may req alt Camr view of RSC

R12 (OBSS) ✓SPEE PWR – ON  
✓RSC PWR – ON  
A7 VID OUT MON 1(2) pb – push  
IN PL 3(WVS) pb – push  
MON 1(2) ✓RSC video displayed

NOTE  
SPEE pwr cycle will reset LDRI/ITVC to Mode 1 and reset the PTU angles

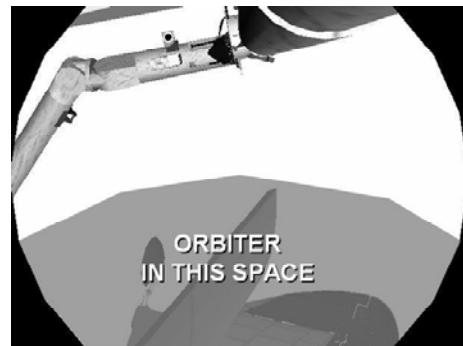
R12 (OBSS) SPEE PWR – OFF, wait 10 sec, then ON  
MON 1(2) ✓RSC video w/illum displayed

To cycle thru illuminator modes:  
R12 (OBSS) SPEE PWR – OFF, wait 10 sec, then ON

**CONTINGENCY LDRI CLEARANCE VIEW**

NOTE  
Do not apply RMS brakes

A8U	AUTO SEQ – STOP (READY lt on)
L10 (VTR)	STOP pb – push (no red •)
A7U	VID OUT MUX 1 L pb – push (MIDDECK lt on) LDRI MODE 3(4) pb – push (steady LDRI video)
	VID OUT MON2 pb – push IN PL2(VPU) pb – push
	Record PTU Pan _____ and Tilt _____
	CAMR CMD PAN/TILT – HI RATE PAN: 0 (left, to hard stop) TILT: 0 (up, to hard stop)



Note clearance thru LDRI FOV  
LDRI

Return PTU to Pan and Tilt values recorded above

VID OUT MUX 1 L pb – push (MIDDECK lt on)  
LDRI MODE 6 pb – push (flickering LDRI video)

VID OUT MON2 pb – push  
IN pb – as desired (not PL2)

L10 (VTR)	REC pb – push, hold PLAY pb – push, simo (red •)
A8U	AUTO SEQ – PROCEED (IN PROG lt on)

HOOK  
VELCRO

**LDRI PAN/TILT RESET**

Reset PTU  
VID OUT MON2 pb – push  
IN PL2(VPU) pb – push

CAMR CMD PAN/TILT – HI RATE  
PAN – L (to hard stop)  
TILT – UP (to hard stop)  
PAN/TILT – RESET

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P/TV/117/FIN

TOP

HOOK  
VELCRO

### LCH ACTIVATION

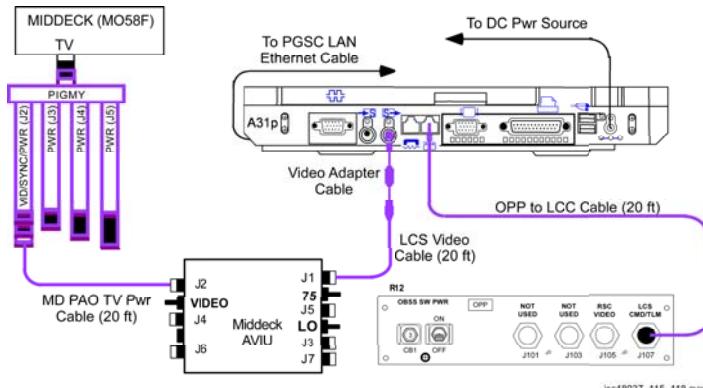
#### APCU/ LCH Pwrup

- R1 1. PL PRI MNC – ON (tb-ON)  
✓CAB – MNA(MNB)
  - SSP 1 2. √cb SW PWR 1 – cl  
APCU1 OUTPUT RLY – CL  
CONV – ON (tb-gray)  
✓OUTPUT RLY tb – gray
- SM 200 APCU STATUS**  
✓APCU1 OUT VOLT RES HIGH: 122V to 126.5V

### LCC ACTIVATION

#### 1. LCC Setup

- A31p ✓Hardware and cables configured per diagram below:



jsa48037\_115\_118.csv

#### 2. LCC PGSC Util Pwr On

- MO63P MN DC UTIL PWR – 10A  
10A J6 – ON  
A31p DC Pwr Supply – ON

#### 3. LCC Startup

- MO58F ✓TV PWR – ON  
AVIU ✓HI/LO – LO
- A31p PGSC Pwr – ON  
Sel 'Shuttle Apps' > 'LCC' (Wait 2-3 min from APCU CONV – ON for GUI Status)  
✓Laser off – blue  
✓Comm – green  
If Laser off and Comm status not correct: ✓MCC

(For APCU1 flights only)

LCS

HOOK  
VELCRO

#### 4. Verify LCC Desktop Video

- A7 VID OUT MON1(2) pb - push  
IN MIDDECK pb – push  
✓LCC desktop displayed on MON1(2)
- \* If LCC Desktop not displayed \*
  - \* ✓MCC \*

### OPERATION

#### NOTE

PDRS OPS will call for appropriate scan steps on LCC.  
MCC may have limited insight if desktop dnlk avail

#### 1. Load Database (if reqd)

- ✓MCC for desired LCS database  
✓'DB Name': Field on upper left-hand side of LCS GUI
- \* If 'DB Name' incorrect: \*
  - \* Sel 'Load Database...' from File menu \*
  - \* Sel MCC desired database file \*
  - \* Sel 'OK'

#### 2. LCS System Status

#### LCS SYSTEM STATUS

Laser On/Off	Comm	LCS State
Laser ? (gray)	No Comm (yellow)	Unknown or Keep Alive Heater Only Mode ( No LCC to LCH Network Connection)
Laser Off (blue)	Comm (green)	Configuration (Waiting for user command)
Laser On (green)	Comm (green)	Operational (Scan in progress)

While Scan in progress ('Scan Status' counter incrementing):

- ✓Laser On – green
- ✓Comm – green
- ✓Scan Display – updating
- ✓Temp – green
- ✓Elec – green

Scan complete when 'Scan Status: Complete' displayed

If LCS system status out of config, perform appropriate TROUBLESHOOTING section of this cue card

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P/TV/117/FIN

TOP  
BACK OF 'LCS'

HOOK  
VELCRO

HOOK  
VELCRO

## LCC DEACTIVATION

NOTE

Shutting down LCC software also puts LCH in keep-alive heater mode. No LCH scans/insight or IDC ops available. APCU Converter pwr cycle reqd to reinitialize LCH for scanning and IDC ops

### 1. LCC Software Shutdown

- A31p      Sel 'File' > 'Exit'  
 When 'Shutdown' dialog box opens:  
   √'Shutdown LCH and Exit LCC Software' selected  
   Sel 'OK'  
 When 'Shutdown?' dialog box opens:  
   Sel 'OK'

### 2. A31p Screen Resolution Reset

Go to RECONFIGURATION OF A31p SCREEN RESOLUTION  
(LCS/IDC)

## LCH DEACTIVATION

CAUTION

Removing APCU Converter Pwr or opening output relay will remove critical keep-alive pwr to LCH and IDC

### 1. APCU Converters Off/LCH Pwrdn

NOTE

Expect 'S200 APCU1(2) VOLT LMT' Msg

SSP 1      APCU1 CONV – OFF (tb-bp)

### 2. Open APCU Output Relay

SSP 1      APCU1 OUTPUT RLY – OP (tb-bp)

### 3. Remove Primary PL Pwr

NOTE

Expect 'S200 APCU1(2) TRIP' Msgs

R1      PL PRI MNC – OFF (tb-OFF)

(For APCU1 flights only)

## TROUBLESHOOTING

Temp or Elec Status Yellow

A31p      Sel 'System' page  
 Report 'Elec' or 'Temp' values backlit in yellow to MCC

Comm Status Yellow and LAN2 Network cable unplugged (red X on A31p system tray)

NOTE

LCC GUI Comm status will be yellow and A31p Local Area Network 2 status (w/red X on A31p system tray) cable unplugged tool tip will appear if LCH is in keep-alive heater mode

A31p      If unexpected red X w/Local Area Network Connection 2 tool tip shown on A31p system tray:



R12      √OPP to LCC Cable connected to LCS CMD/TLM(J107) port  
 A31p      √OPP to LCC Cable connected to LCC RJ45 port  
 Exit LCC software and shut down Windows

NOTE

Expect 'S200 APCU1(2) VOLT LMT' Msg

SSP 1      APCU1 CONV – OFF then ON  
   √CONV tb –gray  
   √OUTPUT RLY tb – gray

SM 200 APCU STATUS

√APCU1 OUT VOLT RES HIGH: 122V to 126.5V

A31p      LCC PGSC Pwr – ON  
   √A31p internal RJ45 Network Interface Card LED green  
   Perform LCC ACTIVATION, steps 1,3

√Local Area Network Connection 2 status icon (with red X) in Windows system tray not displayed  
 √MCC if LCC GUI Comm status still yellow

Message Area Entry

Report LCC GUI message area log entry(ies) to MCC

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P/TV/117/FIN

TOP

HOOK  
VELCRO

IDC

HOOK  
VELCRO

## IDC ACTIVATION

- LCC Setup  
A31p PGSC Pwr – ON
- IDC connectivity Check  
LCC \A31p internal RJ45 Network Interface Card LED green  
If RJ45 Network Interface Card LED not green:  
SSP 1 APCU1 CONV – OFF, then ON  
  \CONV tb – gray  
  \OUTPUT RLY tb – gray  
  
SM 200 APCU STATUS  
\APCU1 OUT VOLT RES HIGH: 122V to 126.5V

## IDC SOFTWARE ACTIVATION

- IDC Software Startup  
A31p Sel 'Shuttle Apps' > 'IDC'
- Verify GMT  
A31p \GMT within 3 sec of SM-GPC GMT
  - \* If GMT not within 3 sec: \*
  - \* Double click on GMT box on GUI \*
  - \* Adjust GMT as reqd \*
  - \* Sel 'OK' on MTU Time dialogue box \*
- IDC Pwr on and self test

**CAUTION**

Pwr off IDC when not imaging. Pointing IDC at Sun when pwr on will damage Camr

A31p Sel 'Power On'
  - \* If 'Power On' pb not gray: \*
  - \* Pause 3 sec, then sel 'Power On' \*
\nBlack and White self-test image displayed  
\Waiting for User Command' displayed
  - \* If red backlit error msg displayed: \*
  - \* Perform appropriate TROUBLESHOOTING \*
  - \* steps on this cue card \*

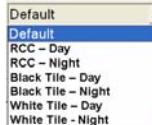
## OPERATION

- NOTE  
PDRS OPS will call for IDC image steps on LCC A31p. Limited MCC real-time insight avail if configured for desktop dnlk
- Configure LDRI Illumination  
R12 (VPU) \Green Jumper – LDRI/ITVC  
A7 VID OUT MUX 1L pb – push  
  IN MIDDECK pb – push  
  LDRI MODE 2 pb – push  
VID OUT MON 1(2) pb – push  
  IN PL2 (VPU) pb – push  
CAMR CMD PAN/TILT – HI RATE  
  PAN – L (to hard stop)  
  TILT – UP (to hard stop)  
  PAN/TILT – RESET  
  – LO RATE within 10°  
  PAN – +85 (right)  
  TILT – -57 (down)

NOTE  
If GMT does not update during Ops, an attempt to shut down/restart A31p should be made

- Auto Exposure (AE) Ops  
A31p \Use AE' checked  
Sel 'Scan Lo-Res'  
Resize and posn AE box as reqd (pause 2 sec)  
Sel 'Scan Hi-Res'  
If Scanning with no RMS Motion:  
| Sel 'Stop Scan' after 30 sec  
If scanning with RMS motion:  
  Move box to maintain RCC in AE box (using keyboard arrows)  
  Sel 'Stop Scan' at pause point  
  \Waiting for User Command' displayed

- Scenario File Ops  
A31p From Scenario File drop-list, sel appropriate lighting condition



Sel 'Acquire Set'  
\'Acquiring Set' displayed  
\'Waiting for User Command' displayed after set

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P/TV/117/FIN

TOP  
BACK OF 'IDC'

HOOK  
VELCRO

HOOK  
VELCRO

### IDC DEACTIVATION

1. IDC and Software Shutdown  
A31p Sel 'Power off' on IDC GUI  
Close (X) IDC software > 'YES'
2. A31p Screen Resolution Reset  
Go to RECONFIGURATION OF A31p SCREEN RESOLUTION  
(LCS/IDC)

### APPENDING COMMENT TEXT TO TIFF

1. If Comment Added Before Scan  
A31p Enter text in comment area  
  
NOTE  
All scans will contain this comment. Text can be cleared with [F2] hot key. Comments cannot be edited post scan
2. If Comment Added After Scan  
A31p Sel 'View File' on IDC GUI  
Double click on desired TIFF file  
Enter text in comment area  
Hit [F4] to append comment

### IDC HOT KEY COMMANDS

- |                                    |                               |
|------------------------------------|-------------------------------|
| F5 – Toggle Summary View           | F6 – Toggle Image Mode        |
| F7 – Zoom In                       | F8 – Zoom Out                 |
| F9 – Reset Brightness and Contrast | F10 – Reset AE Box to Default |
| F11 – Toggle AE Box Visibility     | F12 – Find AE Box             |

### IDC SOFTWARE ERROR MESSAGES

- Can't connect to LCH:** Perform TROUBLESHOOTING, steps 1,2  
Condition: Possible heater only mode or Network failure
- Iport probe failed:** Perform TROUBLESHOOTING, step 2  
Condition: Iport startup check failed. Expected during first pwr on attempt-resend pwr on
- Iport not responding:** Perform TROUBLESHOOTING, step 2  
Condition: Iport connection lost
- Camera not responding:** Perform TROUBLESHOOTING, step 2  
Condition: Camera connectivity lost
- Image acquisition failed:** Perform TROUBLESHOOTING, steps 1,2  
Condition: Camera connectivity lost during imaging
- Network recovery failed:** Perform TROUBLESHOOTING, steps 1,2  
Condition: LCH network switch connection lost
- Bad initialization file:** Perform TROUBLESHOOTING, step 3  
Condition: Software will not launch due to severe ini file corruption

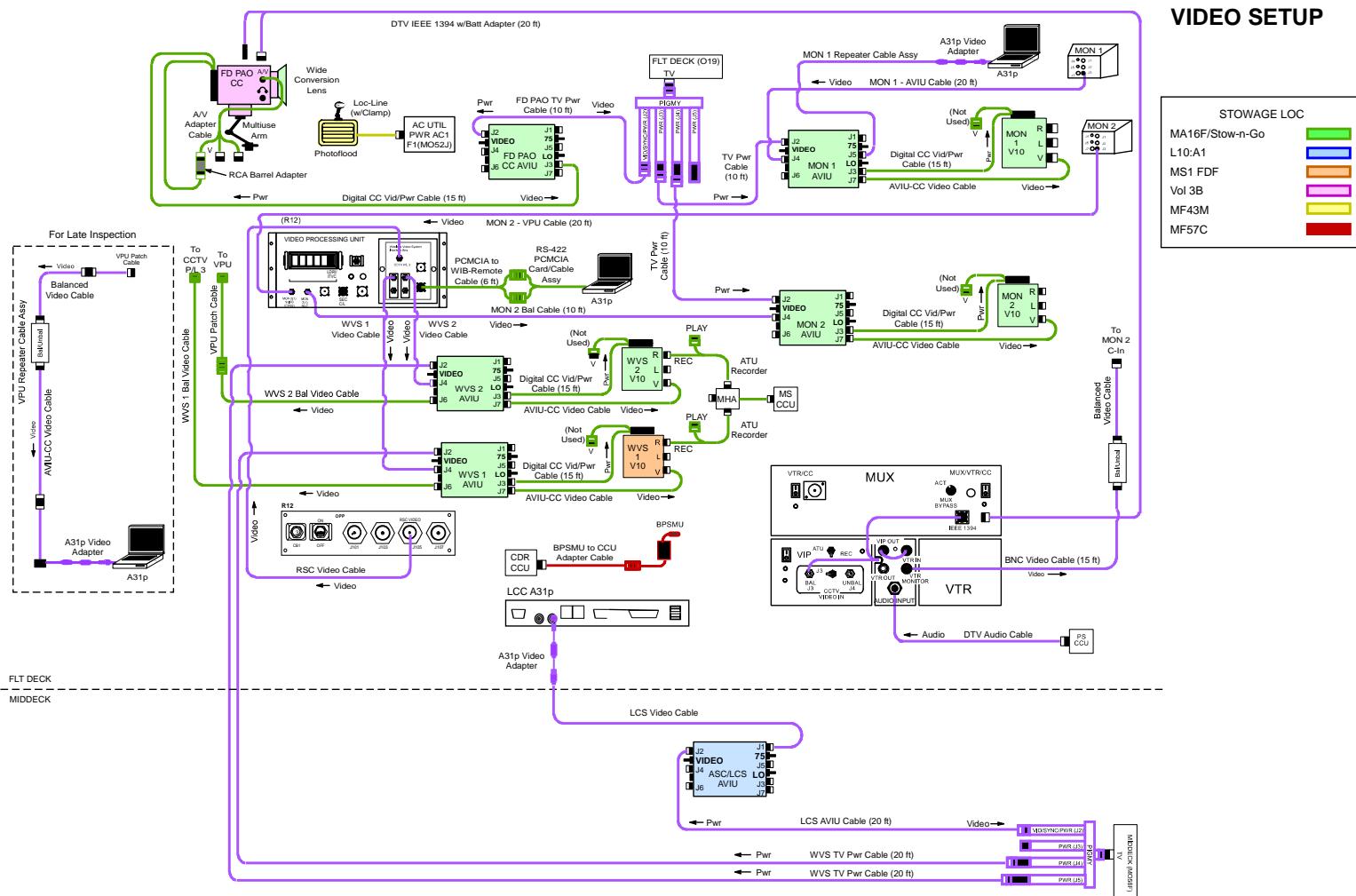
### TROUBLESHOOTING

1. LCC to LCH Connectivity Check  
A31p If Local Area Network Connection 2 (with red X) tool tip on system tray:  
  
  
Reseat OPP to LCC Cable (20 ft) to LCC RJ45 port  
√Local Area Network Connection 2 Speed 10 mps  
If no connection:  
Perform LCH, LCC, and IDC Reset, step 2  
Continue nominal ops
2. LCH, LCC, and IDC Reset  
A31p Exit IDC software and shut down Windows  
√OPP to LCC Cable (20 ft) connected to LCC RJ45 port  
  
NOTE  
Expect 'S200 APCU1(2) VOLT LMT' Msg  
  
SSP 1 APCU1 CONV – OFF then ON  
√CONV tb – gray  
√OUTPUT RLY tb – gray  
  
  
A31p LCC PGSC Pwr – ON  
√A31p internal RJ45 Network Interface Card LED green  
  
Perform IDC SOFTWARE ACTIVATION  
Continue nominal ops
3. LCC Swap  
A31p Exit IDC software and shut down Windows  
Swap LCC with other A31p  
Perform IDC Activation  
Perform IDC Software Activation  
Continue nominal ops

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TOP

## VIDEO SETUP



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P/TV/117/FIN

P/TV-10a/117/O/A

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TOP  
BACK OF 'VIDEO SETUP'

HOOK  
VELCRO

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NOTE

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Space Shuttle Program  
FLIGHT DATA FILE

JSC-48037-117  
FINAL



**PHOTO/TV  
CHECKLIST**

**STS  
117**