

Photo/TV Checklist

Mission Operations Directorate Operations Division

Generic, Rev I
June 5, 2007

NOTE

For STS-120 and subsequent flights

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



Verify this is the correct version for the pending operation (training, simulation or flight).
Electronic copies of FDF books are available. URL: <http://mod.jsc.nasa.gov/do3/FDF/index.html>

PHOTO/TV C/L	GENERIC, REV I (June 5, 2007)
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PCN-2 (Nov 7, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

P/TV-0716

Incorporate the following:

1. Replace iii thru vi
2. Replace 7-9 and 7-10
3. Replace 11-1 and 11-2, 11-5 thru 11-10
4. Replace 20-1 and 20-2, 20-7 and 20-8, 20-15 and 20-16

<p>NOTE For STS-122 and subsequent flights</p>

Prepared by: *David Walker FOR RALPH TWEEDALE* Mission Lead *Carol H. Pierce* Publication Manager

Approved by: *David Walker* Lead, Shuttle Photo/TV Group *(Signature)* Manager, Shuttle Procedures Management

Accepted by: *Michael T. ...* FDF Manager

Encl: 20 pages

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

PHOTO/TV C/L

GENERIC, REV I (June 5, 2007)

PCN-1 (Sept 14, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

P/TV-0714
P/TV-0715

Incorporate the following:

1. Replace iii thru vi
2. Replace 4-11 and 4-12, 4-19 thru 4-24
3. Replace Section 5 (38 pages)
After 5-38, delete 5-39 and 5-40
4. Replace 9-3 thru 9-6
5. Replace 11-9 thru 11-12
6. Replace 12-1 and 12-2, 12-13 thru 12-20
7. Replace 16-3 and 16-4
8. Replace 20-3 thru 20-6, 20-13 and 20-14, 20-17 thru 20-20

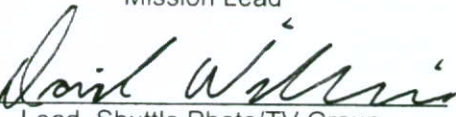

NOTE

For STS-120 and subsequent flights

Prepared by:


Mission Lead
Publication Manager

Approved by:


Lead, Shuttle Photo/TV Group
Manager, Shuttle Procedures
Management

Accepted by:


FDF Manager

Encl: 80 pages

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

MISSION OPERATIONS DIRECTORATE

PHOTO/TV CHECKLISTGENERIC, REVISION I
June 5, 2007

PREPARED BY:



C. Pierce
Publication Manager

APPROVED BY:



D. Williams
Technical Lead, Shuttle Photo/TV Group



K. Johnson
Manager, Shuttle Procedures Management

ACCEPTED BY:



Michael T. Hurt
FDF Manager

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted via FDF Workflow Crew Procedure Change Request (CR) to DO3/FDF Manager.

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

Incorporates the following:	
482#:	P/TV-0710 P/TV-0711 P/TV-0712 P/TV-0713

AREAS OF TECHNICAL RESPONSIBILITY

Publication Manager	DO35/C. Pierce	281-483-6087
Backup Publication Manager	DO35/L. Giles	281-244-9068
Technical Lead, Shuttle Photo/TV Group	DX34/D. Williams	281-244-7882

PHOTO/TV CHECKLIST

LIST OF EFFECTIVE PAGES

GENERIC 11/13/87
 REV I 06/05/07
 PCN-1 09/14/07
 PCN-2 11/07/07

Sign Off	*	ALL/GEN I	4-30	†	ALL/GEN I
ii	*	ALL/GEN I	5-1	†	ALL/GEN I,1
iii	*	ALL/GEN I,2	5-2	†	ALL/GEN I
iv	*	ALL/GEN I,2	5-3	†	ALL/GEN I
v	*	ALL/GEN I,2	5-4	†	ALL/GEN I
vi	*	ALL/GEN I	5-5	†	ALL/GEN I,1
vii	*	ALL/GEN I	5-6	†	ALL/GEN I,1
viii	*	ALL/GEN I	5-7	†⊗	ALL/GEN I,1
1-i		ALL/GEN I	5-8	†⊗	ALL/GEN I,1
1-ii		ALL/GEN I	5-9	†⊗	ALL/GEN I,1
1-1	Δ	ALL/GEN I	5-10	†	ALL/GEN I
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2-1	Δ	ALL/GEN I	5-12	†	ALL/GEN I,1
2-2	Δ	ALL/GEN I	5-13	†	ALL/GEN I,1
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3-2	Δ	ALL/GEN I	5-15	†⊗	ALL/GEN I,1
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4-2	†	ALL/GEN I	5-19	†⊗	ALL/GEN I,1
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4-17	†	ALL/GEN I	5-34	†	ALL/GEN I,1
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4-21	†	ALL/GEN I,1	5-38	†	ALL/GEN I,1
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4-24	†	ALL/GEN I,1	6-3	†	ALL/GEN I
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4-28	†	ALL/GEN I	6-7	†	ALL/GEN I
4-29	†	ALL/GEN I	6-8	†	ALL/GEN I

* – Omit from flight book
 Δ – Replace with pages from Flight Supplement
 † – May be replaced with CD in flight book only
 ⊗ – Flight copies of this page contain color

6-9	†	ALL/GEN I	10-17	†	ALL/GEN I
6-10	†	ALL/GEN I	10-18	†	ALL/GEN I
6-11	†	ALL/GEN I	10-19	†	ALL/GEN I
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7-14	†	ALL/GEN I	12-2	†	ALL/GEN I
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9-1	†	ALL/GEN I	12-11	†	ALL/GEN I
9-2	†	ALL/GEN I	12-12	†	ALL/GEN I
9-3	†	ALL/GEN I,1	12-13	†	ALL/GEN I,1
9-4	†⊗	ALL/GEN I,1	12-14	†⊗	ALL/GEN I,1
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10-4	†	ALL/GEN I	13-2	†	ALL/GEN I
10-5	†	ALL/GEN I	13-3	†	ALL/GEN I
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10-12	†	ALL/GEN I	13-10	†	ALL/GEN I
10-13	†	ALL/GEN I	13-11	†	ALL/GEN I
10-14	†	ALL/GEN I	13-12	†	ALL/GEN I
10-15	†	ALL/GEN I	14-1	†	ALL/GEN I
10-16	†	ALL/GEN I	14-2	†	ALL/GEN I

† – May be replaced with CD in flight book only

⊗ – Flight copies of this page contain color

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15-1	†	ALL/GEN I	20-15	†⊗	ALL/GEN I
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† – May be replaced with CD in flight book only

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NOTE

The hardcopy version of sections 4 thru 21 may be replaced with a CD for flight and inserted in the back of the PHOTO/TV flight-supplement flight book

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DCS 760

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DCS 760

SPECIFICATIONS

CAMR BODY

CCD SIZE: 18.48mm x 27.65mm

PIXEL COUNT: 2008 x 3032

DISK/FRAME: 1 GB Micro Drive: 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: ± 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_H (1.5 fps), C_L (1.0 fps), C_S (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

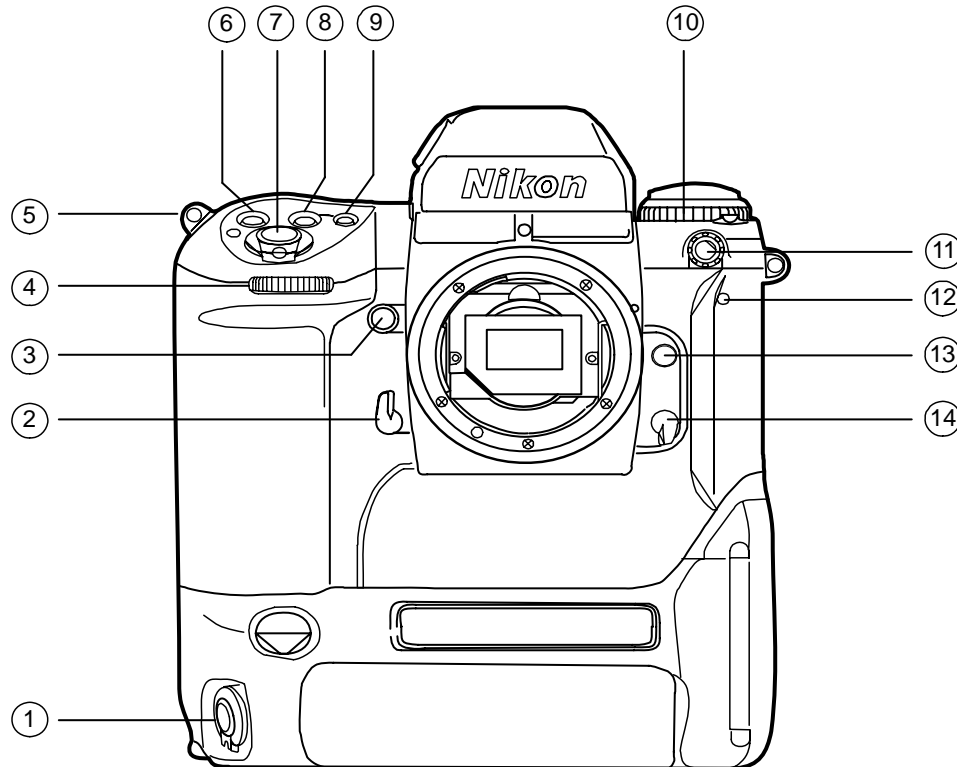
NOTE

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

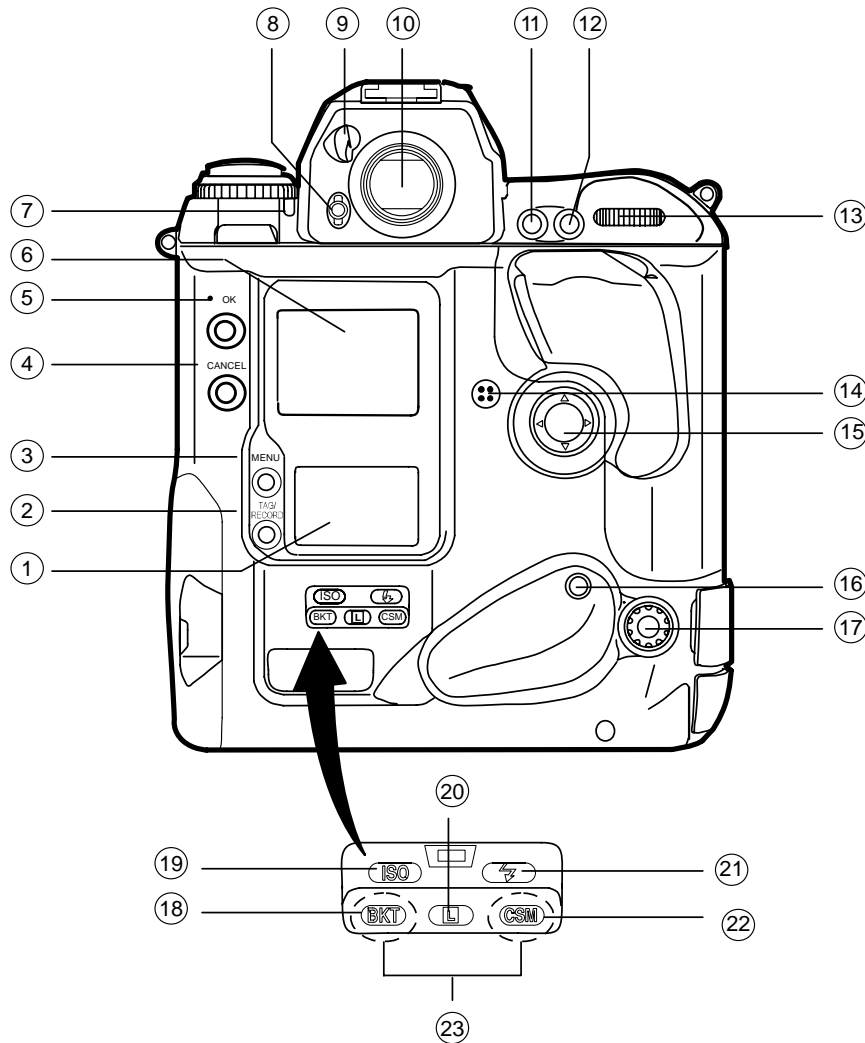



- ① Vertical-Shooting Shutter Release pb
- ② Mirror Lockup Lever
- ③ Depth of Field Preview pb
- ④ Sub-Command Dial
- ⑤ Camr Strap Eyelet
- ⑥ Exposure Compensation pb
- ⑦ Shutter Release pb
- ⑧ Exposure Mode pb
- ⑨ AF Area Mode pb
- ⑩ Film Advance Mode/Selftimer Selector
- ⑪ Sync Terminal
- ⑫ Selftimer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

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DCS 760 (Continued)

NOMENCLATURE (Continued)

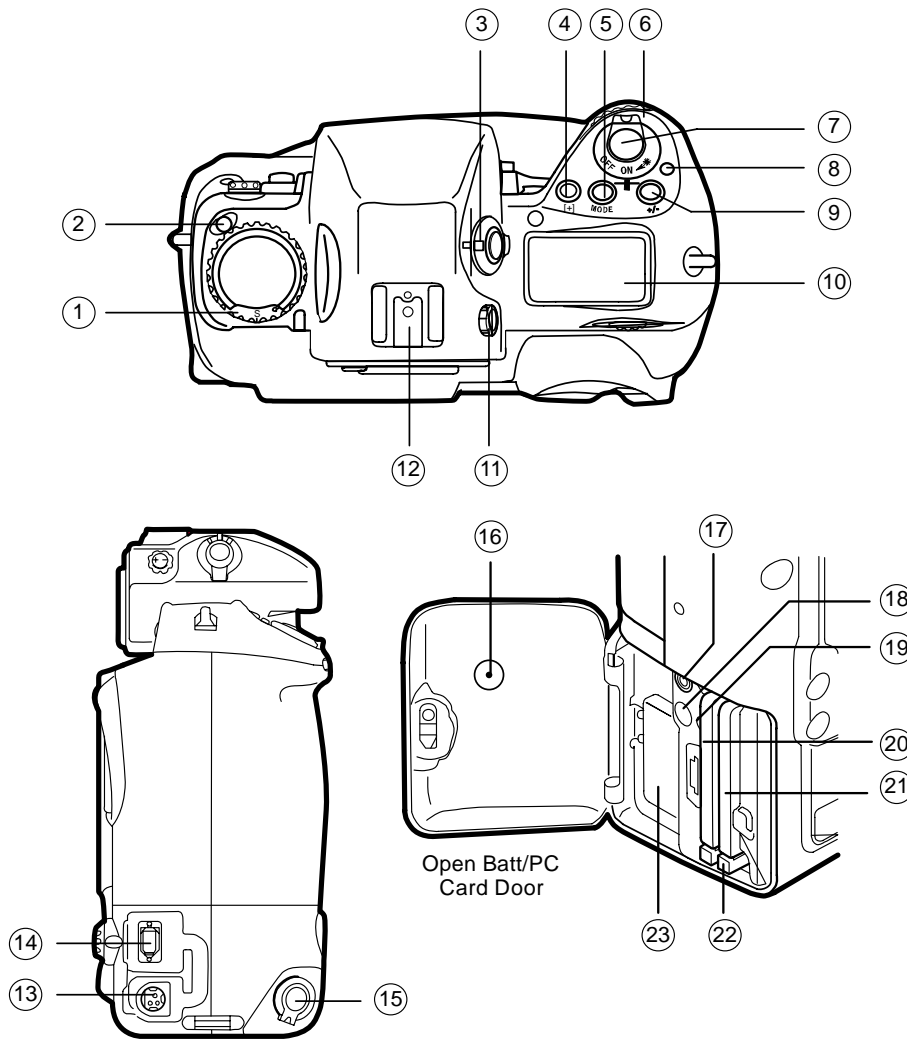


- ① Rear LCD Panel
- ② TAG/RECORD pb
- ③ MENU pb
- ④ CANCEL pb
- ⑤ OK pb
- ⑥ Image LCD Panel
- ⑦ Alert LED
- ⑧ Finder Release pb
- ⑨ Eyepiece Shutter Lever
- ⑩ Viewfinder Eyepiece
- ⑪ Auto Exposure (AE-L)/Autofocus Lock (AF-L) pb
- ⑫ AF Start (AF-ON) pb
- ⑬ Main-Command Dial
- ⑭ Microphone
- ⑮ Navigate Pad
- ⑯ Vertical AF Start (AF-ON) pb
- ⑰ Remote Release Port
- ⑱ Body Bracketing pb **BKT**
- ⑲ ISO pb **ISO**
- ⑳ Shutter Speed/Aperture/Focus Area Lock pb **L**
- ㉑ Flash Sync Mode pb 
- ㉒ Custom Setting Menu pb **CSM**
- ㉓ Green Panic pb

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DCS 760 (Continued)

NOMENCLATURE (Continued)

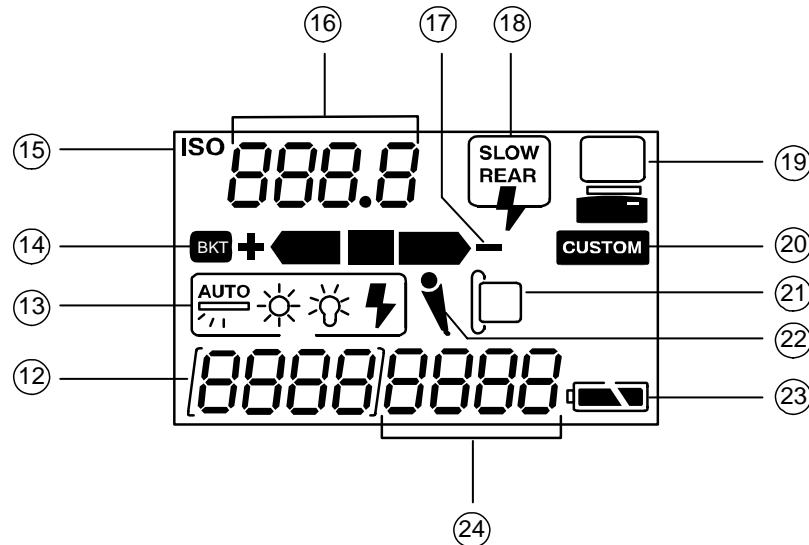
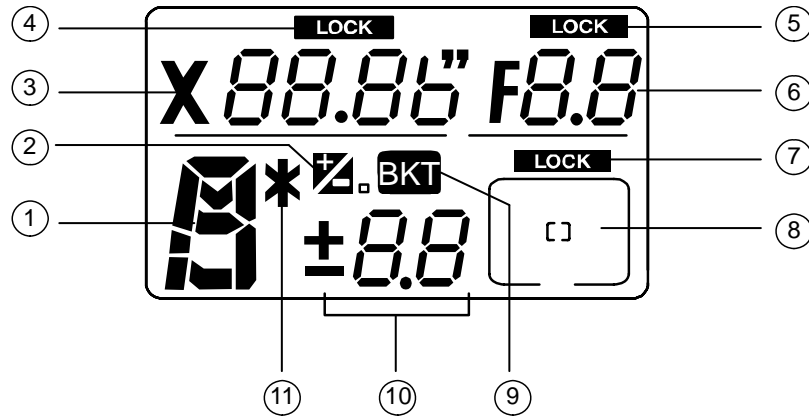


- ① Film Advance Mode/Selftimer Selector
- ② Film Advance Mode Selector Lock Release
- ③ Metering System Selector
- ④ AF Area Mode pb
- ⑤ Exposure Mode pb
- ⑥ Pwr/LCD Panel Illumination sw
- ⑦ Shutter Release pb
- ⑧ Pwr sw Lock Release
- ⑨ Exposure Compensation pb
- ⑩ Top LCD Panel
- ⑪ Diopter Adjustment 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 Card Busy LED Opening
- ⑰ Serial Port
- ⑱ Video Port
- ⑲ Card Busy LED
- ⑳ Hard Drive Slot 1
- ㉑ Hard Drive Slot 2
- ㉒ Eject pb
- ㉓ 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
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- 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

jsc48037_015.cnv

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

DCS 760 (Continued)

CUSTOM SETTINGS (Concluded)

#	Menu	Settings	Notes
18	Focusing Screen Compensation	18 - 0: No compensation	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
		18 - 1: Change setting -2.0 to 2.0: -2 to +2 in 0.5 EV steps	
19	Prolong Shutter Speed	19 - 0: Disabled	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
		19 - 1: Enabled	
20	Top TTL, Flash Sync Speed	20 - 0: Default (1/250 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
		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	
21	AE-L/AF-L pb	21 - 0: Default (simultaneous lock)	Change to AE(AF) lock only
		21 - 1: Change setting AEL: AE lock AFL: AF lock L-L: Simultaneous lock	
22	Aperture Setting via Sub-Command Dial	22 - 0: Enabled	Only way to set aperture is to rotate lens aperture ring
		22 - 1: Disabled	
23	▶ or ◀ Focus Indicator	23 - 0: Displayed	Don't show display of ▶ and ◀ (focused at rear or in front of subject) in viewfinder during Autofocus mode
		23 - 1: Not displayed	
24	Auto Exposure/Flash Exposure Bracketing	24 - 0: Default (auto exposure/flash exposure bracketing)	When Auto(Flash) Exposure Bracketing only wanted
		24 - 1: Change setting 01E: Auto exposure (ambient) bracketing 10E: Flash exposure bracketing 11E: Auto exposure/flash exposure bracketing	

DCS 760 (Continued)

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 (Earth Obs)

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_H
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

TECHNIQUE

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

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_H
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. Dim Cabin lights
2. Use witch’s 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_H
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. Dim Cabin lights
2. Use dark clothing to shield window

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

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_H
Body Focus Mode – S
Aperture – Min, locked
Flash Settings
ON/OFF – OFF
Focus, Frame, Fire, hold for 3 frames

<p>WARNING Do not look at <u>Sun</u></p>

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

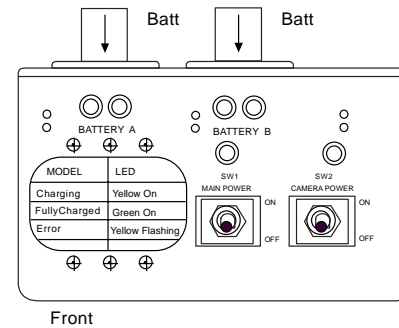
DCS 760 (Continued)

DCS BATT CHARGING

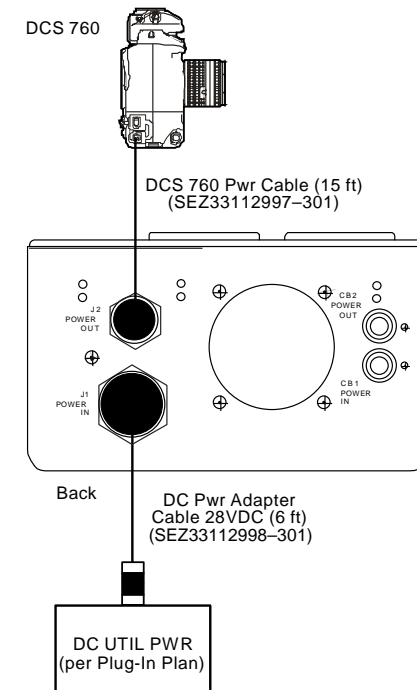
1. Config H/W per dwg below (DCS 760 Pwr Cable reqd for direct Camr pwr)
- Batt Chgr 2. \sqrt{cb} PWR IN (CB1) – cl
3. MAIN PWR – ON (LED on)
4. If Direct Camr Pwr:
 \sqrt{cb} PWR OUT (CB2) – cl
 CAMERA PWR – ON (LED on)
5. Insert Batt(s), check charger LEDs for charge status (~2hr)

NOTE

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



Front




Back

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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 (√microphone icon  appears on rear LCD)
4. Talk to MIC (-9-12 in from MIC)
5. √Speaker icon  appears under image

DCS 760 (Continued)

IMAGE VIEWING ON PGSC

1. Insert Flash Card into PGSC, brand name up
2. If A31p, open SHUTTLE APPS | Kodak DCS Camera | KODAK DCS Photo Desk
If 760XD, open SHUTTLE APPS | 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 760 (Continued)

DCS FILE TRANSFER

NOTE

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

DNLK FROM FLASH CARD

1. Insert Flash Card into **KFX PGSC**, brand name up
2. Inform MCC "files ready"

DCS FILE TO HARD DRIVE

1. Insert 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 (760XD ONLY)

1. Insert suspect Flash Card into PGSC, brand name up |
2. Sel 'Start' | 'Run...'
3. In 'Run' window, type: SCANDISK, then sel OK
4. In 'ScanDisk' window:
 - Sel Flash Card 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

SUSPECT HARD DRIVE SCAN (A31p ONLY)

1. Insert suspect Flash Card into A31p, brand name up |
2. Sel 'My Computer'
3. Right click on drive (D:)
4. Sel 'Properties'
5. Sel 'Tools' tab
6. In 'Error-checking' box, sel 'Check Now...'
7. In 'Check Disk' window:
 - Sel 'Automatically fix file system errors'
 - Sel 'Start'
8. Notify MCC of results
9. Sel 'OK' to close dialog boxes
10. Close 'My Computer' window

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 4-20, 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 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 (Continued)

RECOVER LOST IMAGES

1. Insert suspect Flash Card into A31p, brand name up
2. Open SHUTTLE APPS | Kodak DCS Camera | mediaRECOVER
3. In 'mediaRECOVER' window
 - Sel 'Settings' in left-hand column
 - Under 'My image file size', move slider until '10.00 MB' displayed
 - Sel 'Recovery' in left-hand column
 - In 'Drive to recover' column, sel 'Removable Disk' in pulldown menu
 - Sel 'Next >'
4. In 'Where do you want to save recovered files?' column
 - Sel '...' button
 - In 'Choose directory...' window
 - Sel 'Local Disk (C)'
 - Sel 'OCA-down'
 - Sel 'DCS'
 - Sel 'New Folder' option button
 - Type 'Recover' as new folder name
 - Press Enter
 - Click on 'Recover' folder
 - Sel 'OK'
 - Sel 'Next >'
5. In 'Progress' column
 - √'Preview' box
 - Sel 'Start'
6. In 'Analyze Drive' window

NOTE

Scan will take several min

Sel 'Use folder based recover'
Verify '√' in box next to 'Look for additional lost files'
Sel 'Continue'

DCS 760 (Continued)

RECOVER LOST IMAGES (Concluded)

7. When 'Preview' window appears, move 'Preview' window below 'mediaRECOVER' window to view progress bar

NOTE

When scan completed, 'Save Images' window will appear

8. In 'Save Images' window

NOTE

May take several minutes to save to 'Recover' folder

√All images have '√' in their select box
Sel 'Save Images'

9. When finished saving ('Save Images' window will automatically close), close 'mediaRECOVER' window
10. Close 'Kodak DCS Camera' window
11. Notify MCC regarding location of images

DCS 760

4.1 CAMR FAILS TO FIRE

Camr Fails to Fire

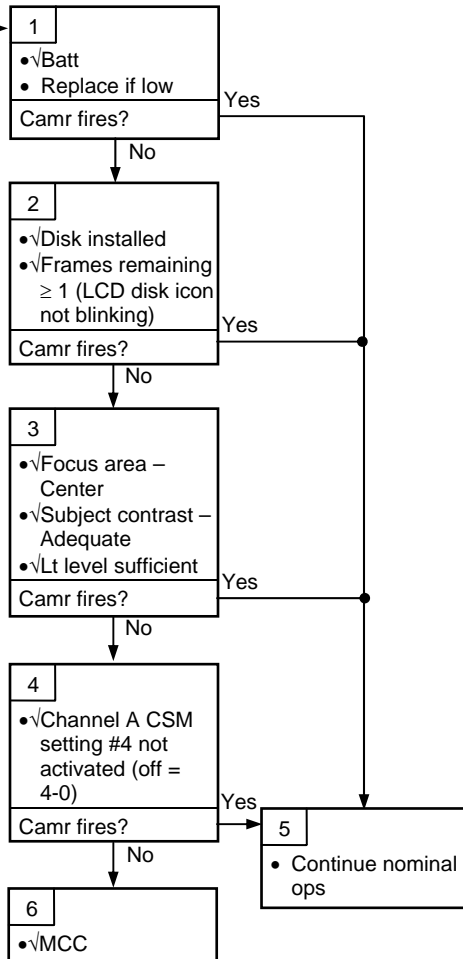
Nominal Config:

(Camr)

- 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 – []
- Meter – Matrix
- Dioptr – Adjust
- Film Adv – S
- Body Focus Mode – S
- Lens Focus Mode – A
- Aperture – Min, locked

(Flash)

- ON/OFF – ON
- √TTL, Matrix
- √Zoom
- Tilt – Direct



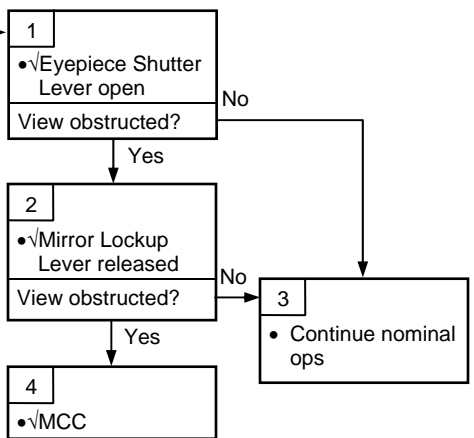
DCS 760

4.2 CANNOT SEE THRU VIEWFINDER

Cannot See Thru Viewfinder

Nominal Config:

- (Camr)
 - 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 – []
 - 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

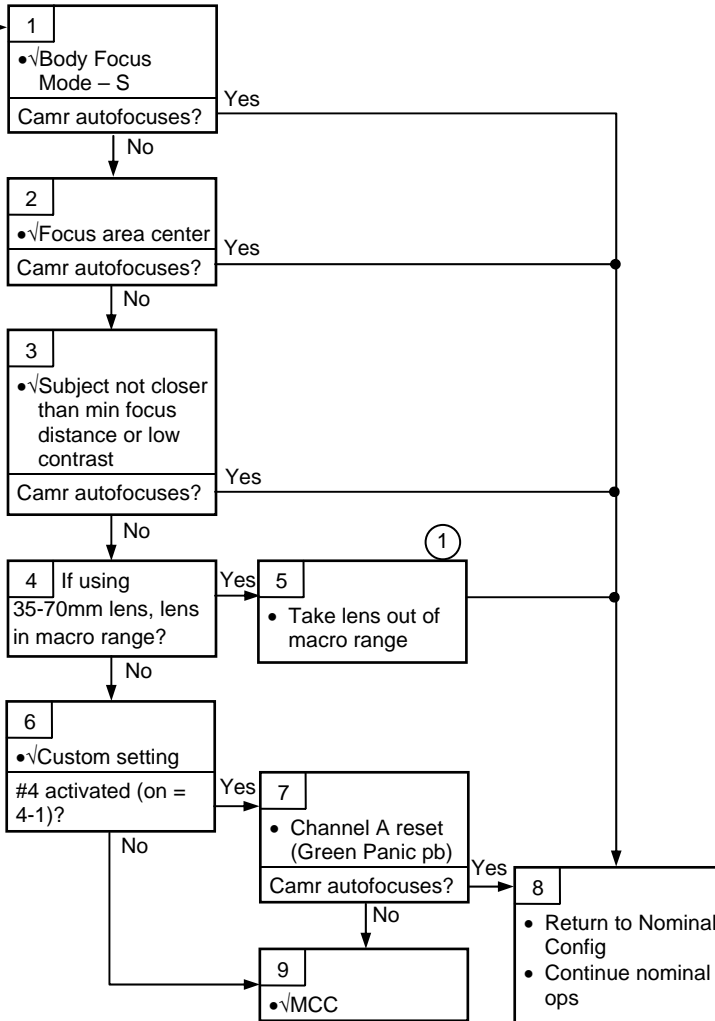


①
35-70mm lens will not auto-focus in Macro

Camr Fails to Auto Focus

Nominal Config:

- (Camr)
- 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 – []
- 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

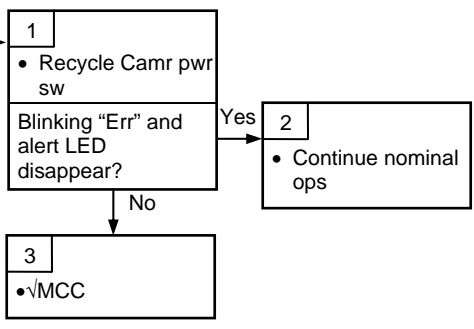
4.4 "ERR" BLINKS ON TOP LCD AND ALERT LED ALSO BLINKS

"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 – Auto
- 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

4.5 EXCESSIVE SAVE IMAGE TO HARD DISK TIME

Excessive Save Image to Hard Disk Time

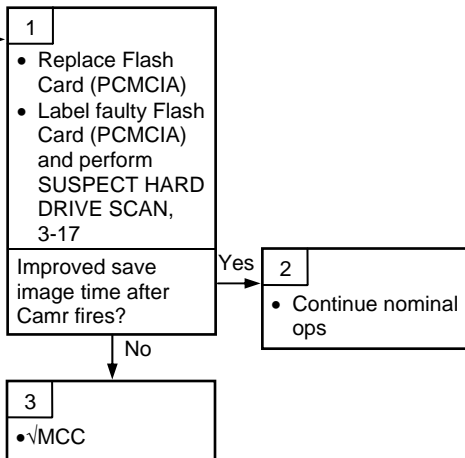
Nominal Config:

(Camr)

- Pwr – ON
- √Disk installed
- Rear LCD
- √Batt
- √Frames remaining sufficient
- √White Balance – Auto
- 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 CAMR

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: ± 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_H (1.5 fps), C_L (1.0 fps), C_S (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

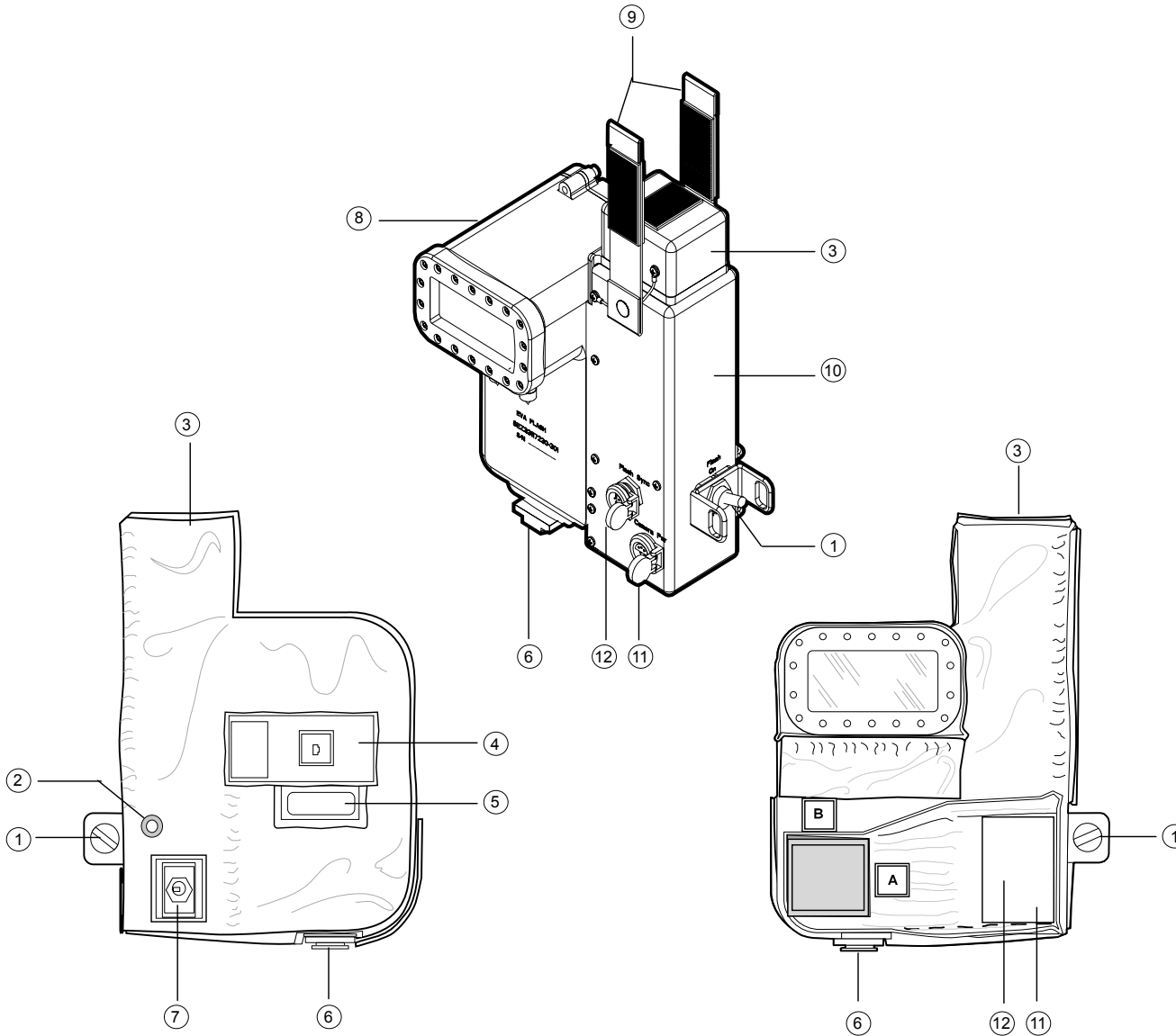
NOTE

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	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



- ① Flash Pwr sw
- ② External Camr Batt Low Light/LED
- ③ Batt Cap
- ④ Rear Flash Display Window
- ⑤ Flash Ready Lt Window
- ⑥ Flash Mount Rail
- ⑦ Camr Batt Pwr sw
- ⑧ Flash Housing
- ⑨ Batt Cap Straps
- ⑩ Batt Housing
- ⑪ External Camr Pwr Port
- ⑫ Flash Sync Port

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DCS 760 EVA CAMR (Continued)

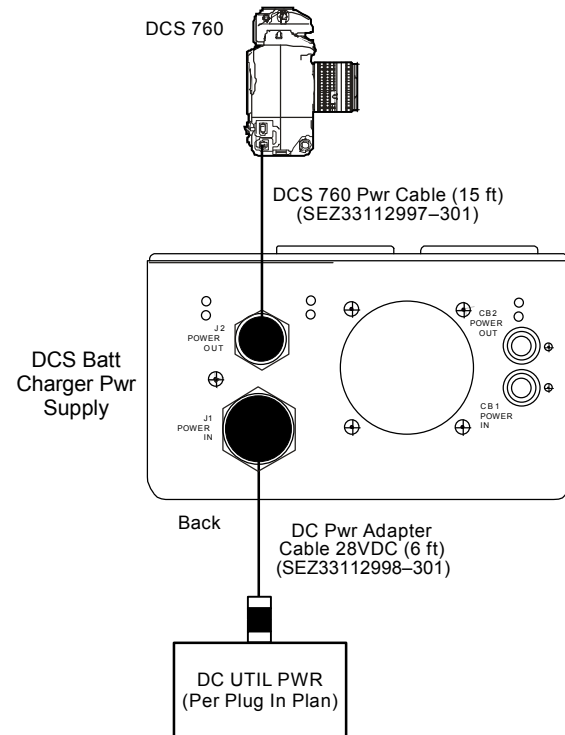
760 EVA – CAMR ONLY

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 Reqd
 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
 Tie Wraps (4/Camr)
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, 5-33
 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, 5-33
 Install first 1 GB EVA Flash Card in slot 2
 √White Balance – Auto

DCS 760



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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
 - √Firmware version 3.3.14, page 0
 - √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)

DCS 760 EVA CAMR (Continued)

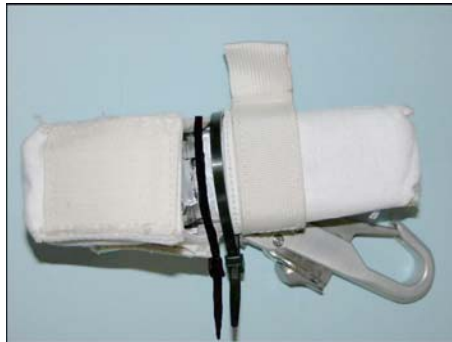
760 EVA – CAMR ONLY (Continued)

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
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)

NOTE

Tie Wrap joints should be on opposite side from pull tab on Thermal Cover

21. Inspect DCS 760 Camr Foot and retaining screw. If loose, tighten. Torque to 37 in-lb (1/4-in Driver Handle, 1/4-in to 3/8-in Step-up, 3/16-in Hex Head, 10-50 in-lb Torque Wrench)
22. Wrap Tie Wraps (two) around Camr Mounting Assy threading them under Thermal Blanket in back



DCS 760 EVA CAMR (Continued)

760 EVA – CAMR ONLY (Continued)

NOTE

Enough slack should be left in loops to allow threading of two additional Tie Wraps

23. Insert remaining Tie Wraps (two) thru Camr Mount Loop



24. Install Camr Mounting Assy w/Thermal Blanket from rear
25. ✓Camr Mounting Assy seated, will not slip off Camr. Release pb – out
26. Loop Tie Wraps (two) from step 23 thru D-Ring on Camr Thermal Blanket. Secure w/o pulling D-Ring taut
27. Tighten Tie Wrap loops to snug fit
28. Trim ends as reqd



FINAL CONFIGURATION

29. Temp stow Flap 3 (will not be used for EVA)
30. Stow Camr until day of EVA

DCS 760 EVA CAMR (Continued)

760 EVA – CAMR ONLY (Concluded)

If Remote Cord Assy used:

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



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

NOTE

Do not remove Camr from orbiter pwr

37. 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. Use scissors to remove Tie Wraps (four) from Camr Mounting Assy and D-Ring
 2. Detach Camr Mounting Assy from DCS 760
 3. In order to access Batt/PC Door, open Flap 1 of EVA Camr Blanket
 4. Remove Light-Pipe from Batt/PC Door
 5. 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 – Yes
 - √Long Exposures Processing – Exposures > 1/4 sec
 - Camr Pwr – OFF
 - Replace Action Viewfinder w/Nominal Viewfinder

DCS 760 EVA CAMR (Continued)

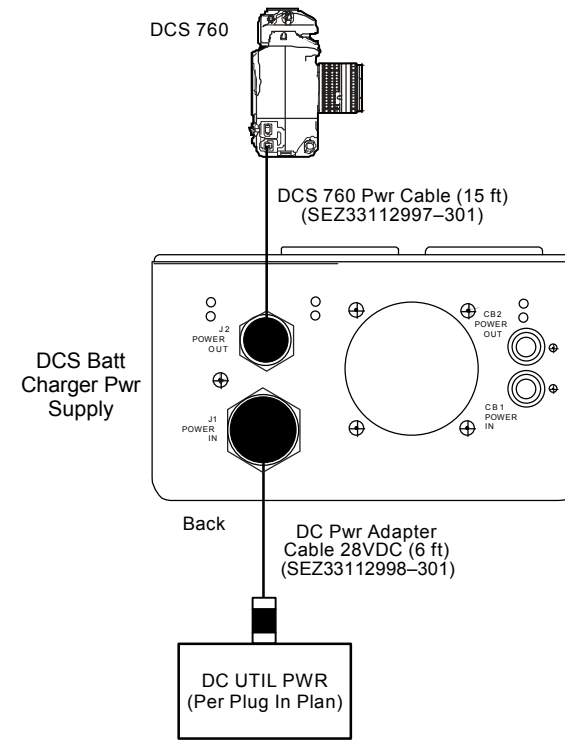
760 EVA – CAMR w/BRACKET ONLY

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 Reqd
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
Tie Wraps (4/Camr)
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, 5-33
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, 5-33
Install first 1 GB EVA Flash Card in slot 2

DCS 760



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DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

- DCS 760 4. Camr Settings (Concluded)
- √White Balance – Auto
 - √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
 - √Firmware version 3.3.14, page 0
 - √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 Chgr 6. CAMR PWR – OFF (LED off)

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
- DCS Batt Chgr
 - 14. CAMR PWR – ON (LED on)
 - 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)

NOTE

Tie Wrap joints should be on opposite side from pull tab on Thermal Cover

25. Inspect DCS 760 Camr Foot and retaining screw. If loose, tighten. Torque to 37 in-lb (1/4-in Driver Handle, 1/4-in to 3/8-in Step-up, 3/16-in Hex Head, 10-50 in-lb Torque Wrench)
26. Wrap Tie Wraps (two) around Camr Mounting Assy threading them under Thermal Blanket in back



DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

NOTE

Enough slack should be left in loops to allow threading of two additional Tie Wraps

27. Insert remaining Tie Wraps (two) thru Camr Mount Loop



28. ✓DCS 760 Camr and Camr Mount seated, will not slip off Bracket Assy. Release pb – out
29. Loop Tie Wraps (two) from step 27 thru D-Ring on Camr Thermal Blanket. Secure w/o pulling D-Ring taut
30. Tighten Tie Wrap loops to snug fit
31. Trim ends as reqd



FINAL CONFIGURATION

DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BACKET ONLY (Continued)

~
NOTE

Do not remove Camr from orbiter pwr

32. Stow until day of EVA

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

33. 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

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



Mount for EVA Camr

Mount for Camr Mounting Assy (underneath)

35. Install DCS 760 Camr onto Bracket Assy (from front)

36. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)

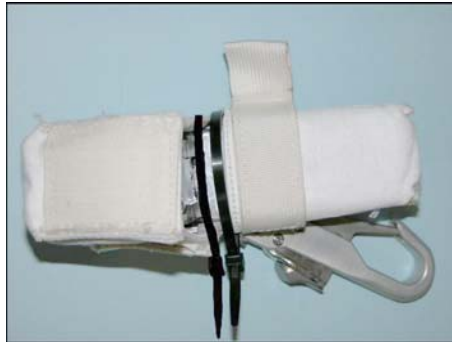
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

NOTE

Tie Wrap joints should be on opposite side from pull tab on Thermal Cover

37. Wrap Tie Wraps (two) around Camr Mounting Assy threading them under Thermal Blanket in back



NOTE

Enough slack should be left in loops to allow threading of two additional Tie Wraps

38. Insert remaining Tie Wraps (two) thru Camr Mount Loop



39. ✓DCS 760 Camr and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out
40. Loop Tie Wraps (two) from step 37 thru D-Ring on Camr Thermal Blanket. Secure w/o pulling D-Ring taut

DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

41. Tighten Tie Wrap loops to snug fit
42. Trim ends as reqd



FINAL CONFIGURATION

- DCS 760
43. Remove Flap 3 from EVA Camr Blanket
Place Remote Cord Assy into Flap 3 per photo; close flaps



44. 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)

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



46. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
47. Test fire w/Remote Release (two shots)
√Shutter Release on Remote Cord Assy not locked
48. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

NOTE

Do not remove Camr from orbiter pwr

49. Stow until day of EVA

DCS 760 EVA CAMR (Continued)

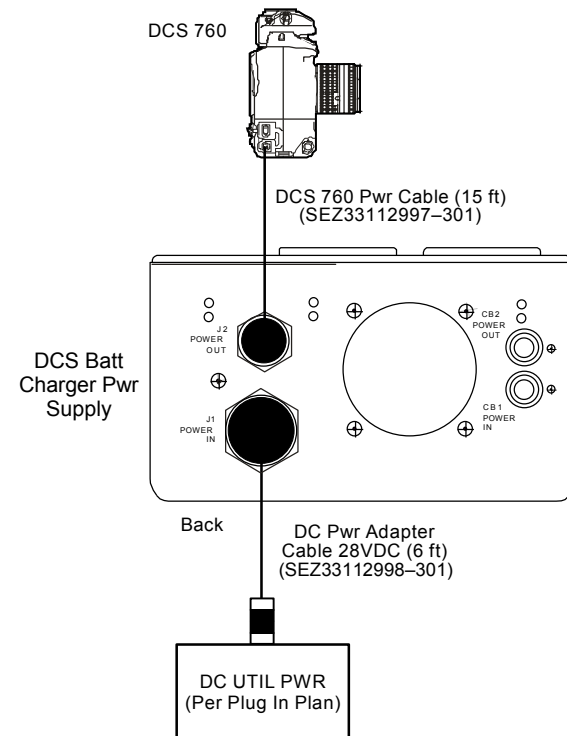
760 EVA – CAMR w/FLASH

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 Reqd
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)
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, 5-33
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, 5-33
Install first 1 GB EVA Flash Card in slot 2

DCS 760



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DCS 760 EVA CAMR (Continued)

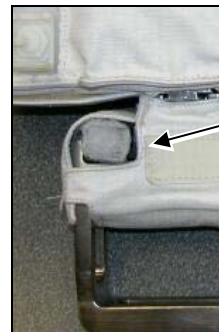
760 EVA – CAMR w/FLASH (Continued)

- DCS 760 4. Camr Settings (Concluded)
- √White Balance – Auto
 - √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
 - √Firmware version 3.3.14, page 0
 - √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)

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
- DCS 760 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
- DCS Batt Chgr 14. CAMR PWR – ON (LED on)
- 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

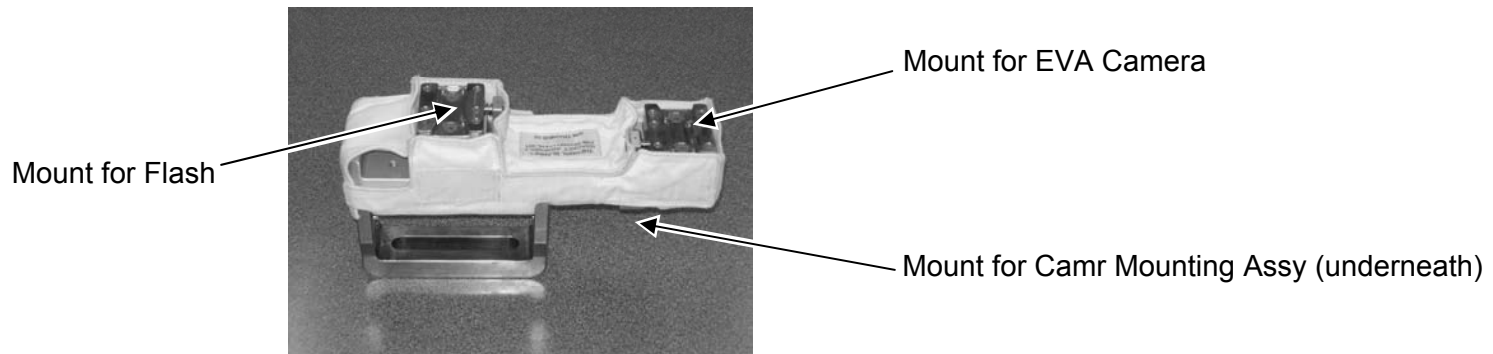


Remote Cord Lip

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)

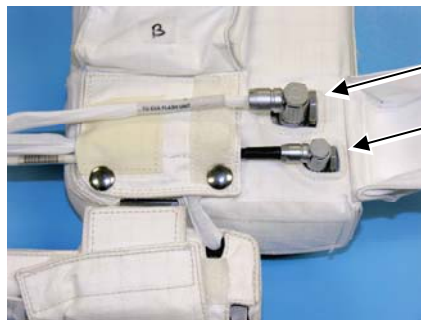
760 EVA – CAMR w/FLASH (Continued)

- 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



Sync Port

Ext Camr Pwr Port

- DCS 760
36. Connect Flash Sync Cable Assy to Flash Sync Port on EVA Flash

DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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





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

DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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


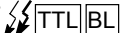
55. Stow until day of EVA



DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Concluded)

PRIOR TO ENTERING AIRLOCK:

- | | |
|------------------|--|
| | If Camr only: |
| DCS Batt
Chgr | 1. Camr Pwr – off |
| DCS 760 | 2. Disconnect DCS 760 Pwr Cable |
| | 3. Remove 28mm Lens Cap |
| | 4. Test fire Camr |
| | 5. Install 28mm Lens Cap |
| | If Camr w/Flash: |
| EVA Flash | 6. Remove Batt Cap |
| | 7. Install two DCS 760 Batts into CAMERA,FLASH slots (align arrows) |
| | 8. Reinstall Batt Cap |
| | 9. Flash – ON |
| | 10. Activate Camr |
| | 11. Open Flap D; verify following: |
| | √Mode –  |
| | If  not displayed, press viewfinder Forward |
| | √Zoom – “M” not displayed |
| | If “M” displayed, contact MCC |
| DCS Batt
Chgr | 12. Camr Pwr – off |
| DCS 760 | 13. Disconnect DCS 760 Pwr Cable |
| | 14. Connect DCS EVA 7 VDC Pwr Cable to Camr (flat side fwd) |
| | 15. Secure snap on Flap 3 to EVA Camr Blanket |
| | 16. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap) |
| | 17. Test fire Camr w/Flash |
| | 18. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap) |
| EVA Flash | 19. Flash – OFF |
| | 20. Close Flap D |
| | 21. Close Flap C |
| | 22. CAMR BATT PWR – EXT |



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 – Yes
 - √Long Exposures Processing – Exposures > 1/4 sec
3. Camr Pwr – OFF
4. Replace Action Viewfinder w/Nominal Viewfinder

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 Flash Card 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 Flash Card 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 pwr'd 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 – Auto
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 dnk to MCC-H

CAMR SETTINGS – DEACTIVATION

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

DCS 760 EVA CAMR (Concluded)

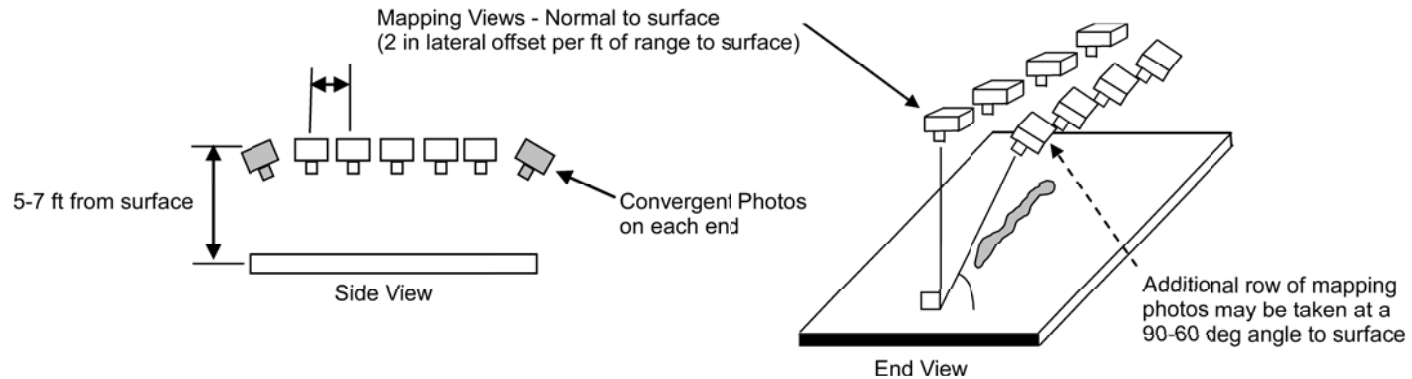
STEREO PHOTOGRAMMETRY PROCEDURE

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

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EVA IR CAMR

SPECIFICATIONS

CAMR

PIXEL COUNT: 320 x 240

SPECTRAL RANGE: 7.5 μ m-13 μ m (Far IR)

INTERNAL RAM MEMORY: 600 images

CF CARD/FRAME: 1 GB/6000 images

FILE SIZE: ~167 KB per image

TEMPERATURE SENSING RANGE: -40°F to +250°F(-40°C to +120°C)

LEVEL/SPAN: Auto(Manual)

EMISSIVITY RANGE: 0.01 to 1.0

BATT: EHIP

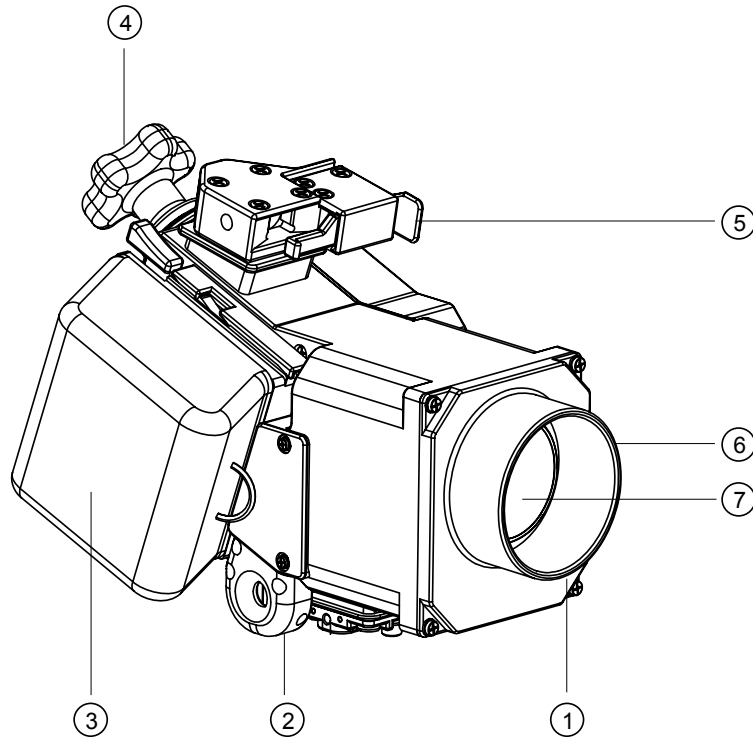
BATT VOLTAGE: 6V

LENS FOV: 24°x18°

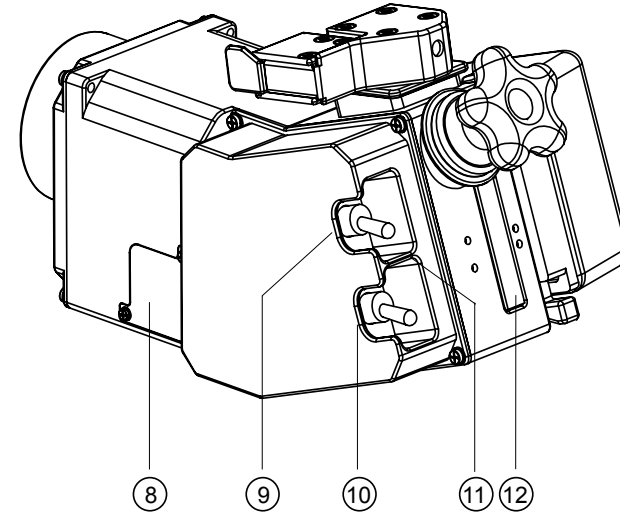
POINTING LASER: Wavelength = 635nm

EVA IR CAMR (Continued)

NOMENCLATURE



- ① Pointing Laser - Lower side of Baffle (not shown)
- ② RCU Cable Strain Relief
- ③ EHIP Batt
- ④ EVA Knob (provides handhold for pointing)
- ⑤ STD Slide-Lock (holds remote during translation)
- ⑥ Lens Baffle

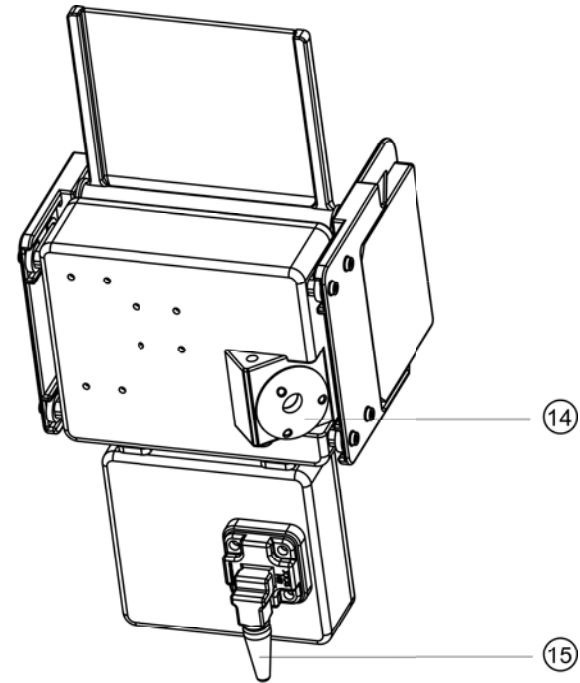
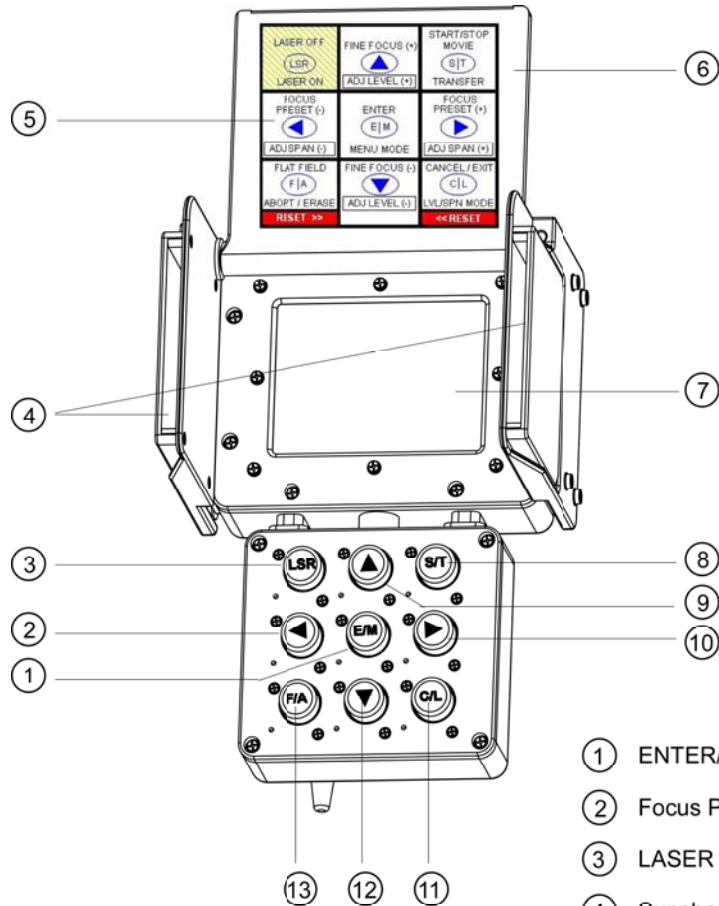


- ⑦ Lens
- ⑧ Access Cover
- ⑨ ENABLE sw
- ⑩ MASTER sw
- ⑪ Batt Status Indicator LED
- ⑫ Compact Flash Memory Card Access
(Card secured w/latch (not shown))

jsc48037_121_076.cvx

EVA IR CAMR (Continued)

NOMENCLATURE (Continued)












- ① ENTER/MENU MODE (E/M) pb
- ② Focus Preset (-) / Adj Span (-) pb
- ③ LASER (LSR) pb
- ④ Sunshades
- ⑤ Pb Map/Cheat Sheet
- ⑥ LCD Cover
- ⑦ LCD
- ⑧ START,STOP/TRANSFER (S/T) pb
- ⑨ Fine Focus (+) / Adj Level (+) pb
- ⑩ Focus Preset (+) / Adj Span (+) pb
- ⑪ CANCEL/LEVEL (C/L) pb
- ⑫ Fine Focus (-) / Adj Level (-) pb
- ⑬ FLAT FIELD/ABORT,ERASE (F/A) pb
- ⑭ Cable Attach Point
- ⑮ Bayonet

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EVA IR CAMR (Continued)

NOMENCLATURE (Continued)

LASER OFF  LASER ON	FINE FOCUS (+)  ADJ LEVEL (+)	START/STOP MOVIE  TRANSFER
FOCUS PRESET (-)  ADJ SPAN (-)	ENTER  MENU MODE	FOCUS PRESET (+)  ADJ SPAN (+)
FLAT FIELD  ABORT / ERASE	FINE FOCUS (-)  ADJ LEVEL (-)	CANCEL / EXIT  LVL/SPN MODE
RESET >>		<< RESET

LSR pb

- Push to turn laser OFF
- Push,hold ~3 sec to activate laser

Up/Down Arrow pbs

- Push,hold to fine focus
- When in "Level/Span:Manual", push,hold to increase(decrease) level
- When in Menu Mode, use to navigate and change parameters

S/T pb

- Push to start(stop) movie recording
- Push,hold ~3 sec to transfer images from RAM to compact flash card

Left/Right Arrow pbs

- Push to select preset focus distances (3,6,9,12 ft, or infinity)
- When in "Level/Span:Manual", push,hold to adjust span
- When in Menu Mode, use to navigate and change parameters

E/M pb

- Push to enter functions or change parameters
- Push,hold ~3 sec to enter Menu Mode

F/A pb

- Push to perform flat field correction
- When transferring a movie, push,hold ~3 sec to abort transfer
- When not transferring a movie, push,hold ~3 sec to erase imagery in RAM

C/L pb

- Push to cancel(exit) various menu/Camr options
- After selecting "Manual Adjust" in menu, push,hold ~3 sec to toggle the functionality of Up/Down/Left/Right arrow pbs between focus and level/span modes

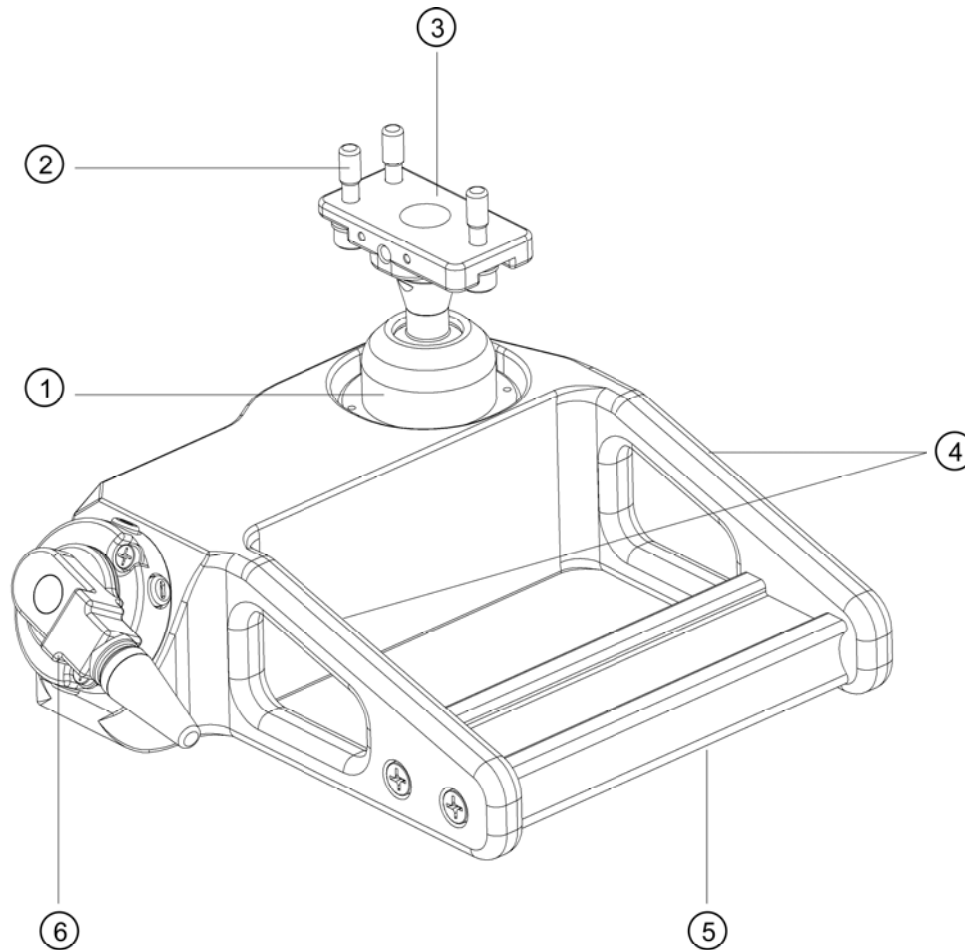
F/A and C/L pbs simo

- Push,hold simo ~3 sec to reset menu settings back to default parameters

EVA IR CAMR (Continued)

NOMENCLATURE (Concluded)

I



- ① Ball Joint
- ② Bracket Screws
- ③ Camr Interface
- ④ Tether Loop (two)
- ⑤ Dogbone Handrail
- ⑥ Clockable Bayonet

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EVA IR CAMR (Continued)

CAMR SETUP

1. If Camr Bracket not installed, perform IR CAMR BRACKET ASSEMBLY procedure
2. Install EHIP Batt
3. ✓CF card installed
4. Lens Cover – Fold to left side
5. MASTER sw – ON (wait 20 sec for initialization)
6. ✓Manual('Level/Span: Manual') not displayed in top left of LCD
7. ✓Date/Time – GMT
8. E/M pb – push,hold
 - Sel: "File – Burst Setup"
 - Max # frames – 300
 - Save every – 12th frame
 - ✓FPS – 5.0
 - ✓Elapse Time – 60
 - E/M pb – push
9. E/M pb – push,hold
 - Sel: "File – Images..."
 - If images present in directory:
 - E/M pb – push,hold
 - Sel: "Delete all images"
 - Sel: "Delete"
 - ✓NO images present in directory
 - C/L pb – push
10. ENABLE sw – OFF (hold for 3 sec, observe shutdown msg on screen)
11. Lens cover – Reinstall
12. If not using within 3 hr:
 - MASTER sw – OFF

IR CAMR BRACKET ASSEMBLY

1. Tools Req'd (IFM Tool Locker Tray 3)
 - 1/4-in Torque Wrench (40-200 in-lb)
 - 5/32-in Hex Ball
2. Align Camr Body to Camr Bracket
3. Tighten bracket screws to Camr Body, snug (three screws, 5/32-in Hex Ball)
4. Torque bracket screws to 49 in-lb

EVA IR CAMR (Continued)

NOMINAL MENU SETTINGS

FILE ('File')

Images... – N/A
Save – N/A
Burst Setup
 Max # Frames – 300
 Save every – 12th frame
 FPS – 5.0
 Elapse Time – 60
Burst recording... – N/A

ANALYSIS ('Analysis')

Object Param...
 Emissivity – 0.96
 Distance – 6.6 ft
 T Reflected – 68°F
 T Atmosphere – 68°F
 Rel Humidity – 30%
 External optics – Off
 Optics transmission – N/A
 Optics temperature – N/A

IMAGE ('Image')

Level/Span... – N/A
Manual Adjust – displayed
Palette...
 Palette – Gray
 Inverted – No

SETUP ('Setup')


Image...
 Adjust method – Histogram
 Lock scale – Off
 Lock value – blank
 Scale – On
 Status bar – On
 Saturation colours – Off
 Noise reduction – Off
 Shutter period – Normal
Other Settings
 Power...
 Auto power off – None
 Display power off – None
 LCD illumination – Medium
 Date/Time... – set per GMT
Local Settings...
 Temp unit – °F
 Distance unit – Feet
 Date format – MM/DD/YY
Camera info... – N/A
Profile – N/A
Factory default – N/A

EVA IR CAMR (Continued)

MOVIE RECORDING

1. √MASTER sw – ON
2. Lens Cover – remove
3. ENABLE sw – ON
4. Wait 5 min before recording images
5. Focus on subject
6. F/A pb – push
7. S/T pb – press (start recording)
8. S/T pb – press (stop recording)
9. S/T pb – press and hold (transfer)
10. √Transfer complete

MOVIE PLAYBACK

1. E/M pb – push,hold
2. Sel: “File – Images...”
3. E/M pb – push
4. Sel desired file
5. E/M pb – push
6. Sel: 
7. E/M pb – push
8. When finished: C/L pb – push

DOWNLINKING FILES

- | | |
|----------|---|
| IR Camr | 1. Remove compact flash (CF) card from Camr |
| | 2. Assemble CF Card and PCMCIA Adapter |
| KFX PGSC | 3. Place assembled card,adapter in PGSC |
| | 4. Copy files to “C:\Oca-down\dto851” |
| | 5. Remove assembled card,adapter from PGSC |
| | 6. Disassemble and place CF Card back into Camr |

DELETING FILES

DELETE SINGLE FILES ON CF CARD

1. E/M pb – push,hold
2. Sel: “File – Images...”
3. E/M pb – push
4. Sel desired file
5. E/M pb – push,hold
6. Sel: “Delete”
7. E/M pb – push
8. Sel: “Delete”
9. E/M pb – push

DELETE ALL FILES ON CF CARD

1. E/M pb – push,hold
2. Sel: “File – Images...”
3. E/M pb – push
4. E/M pb – push,hold
5. Sel: “Delete all images”
6. E/M pb – push
7. Sel: “Delete”
8. E/M pb – push
9. C/L pb – push

EVA IR CAMR (Concluded)

LEVEL/SPAN MODES

MANUAL ADJUST MODE

NOTE

In this mode, user adjusts level,span

1. E/M pb – push,hold
2. Sel: “Image – Manual adjust”
3. E/M pb – push

NOTE

C/L pb will change functionality of arrow pb.

If “Level/Span: Manual” displayed in top left of LCD:
Up/Down arrow pbs adjust level
Left/Right pbs adjust span.

If “Manual” displayed in top left of LCD:
Up/Down arrow pbs adjust fine focus
Left/Right pbs adjust focus preset

CONTINUOUS ADJUST MODE

NOTE

In this mode, Camr automatically adjusts level,span

1. E/M pb – push,hold
2. Sel: “Image – Continuous adjust”
3. E/M pb – push

DATE/TIME SET

1. E/M pb – push,hold
2. Sel: “Setup – Other settings”
3. E/M pb – push
4. Sel: “Date/time”
5. E/M pb – push
6. Sel desired field (up/down arrow pb)
7. Sel desired setting (left/right arrow pb)
8. E/M pb – push

SELECTING DIFFERENT PALETTES

1. E/M pb – push,hold
2. Sel: “Image – Palette...”
3. E/M pb – push
4. Sel desired palette (left/right arrow pb)
5. E/M pb – push

RESET TO NASA PROFILE

1. √All images transferred to CF card
2. F/A pb,C/L pb – push and hold simo for 3 sec

DEACTIVATION

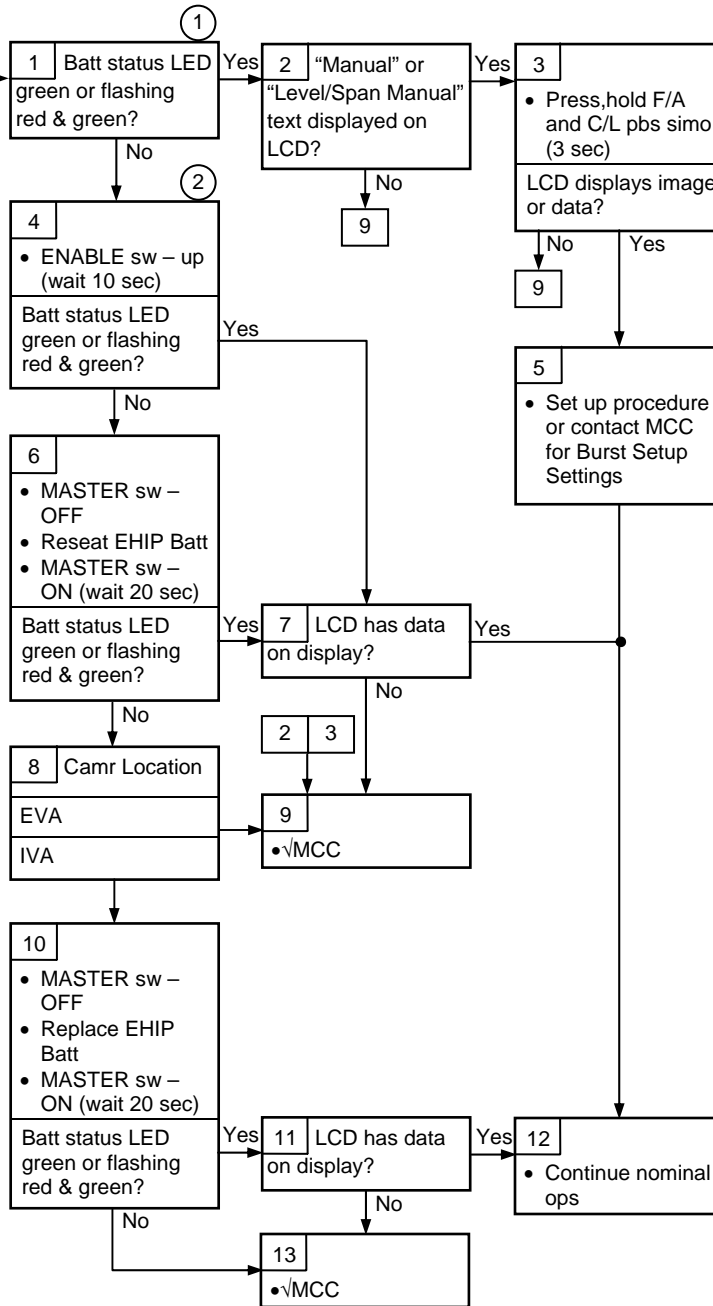
1. √All images transferred to CF card
2. ENABLE sw – OFF (hold for 3 sec)
3. MASTER sw – OFF
4. Lens Cover – cl

IR CAMR

6.1 NO LCD PWR/DISPLAY

No LCD Pwr/Display

Nominal Config:
 (Camr)
 EHIP – install
 CF Card – install
 Lens Cover – fold to left
 MASTER sw – ON
 “Level/Span: Manual” or “Manual” not display on LCD
 (RCU Menu – Burst Setup)
 Max # frames: 300
 Save every: 12 frame



- ① Flashing red & green LED indicates that 75% of Batt has been used
- ② ENABLE sw is a momentary sw

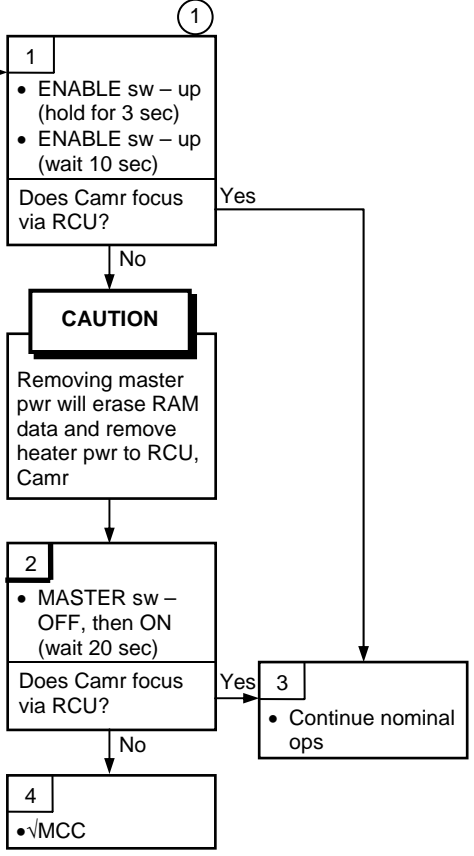
IR CAMR

6.2 RCU pbs NOT RESPONDING

RCU pbs Not Responding

Nominal Config:
(Camr)
EHIP – install
CF Card – install
Lens Cover – fold to left
MASTER sw – ON
√“Level/Scan: Manual” or “Manual” not display on LCD

(RCU Menu – Burst Setup)
√Max # frames: 300
√Save every: 12 frame



①
ENABLE sw is a momentary sw

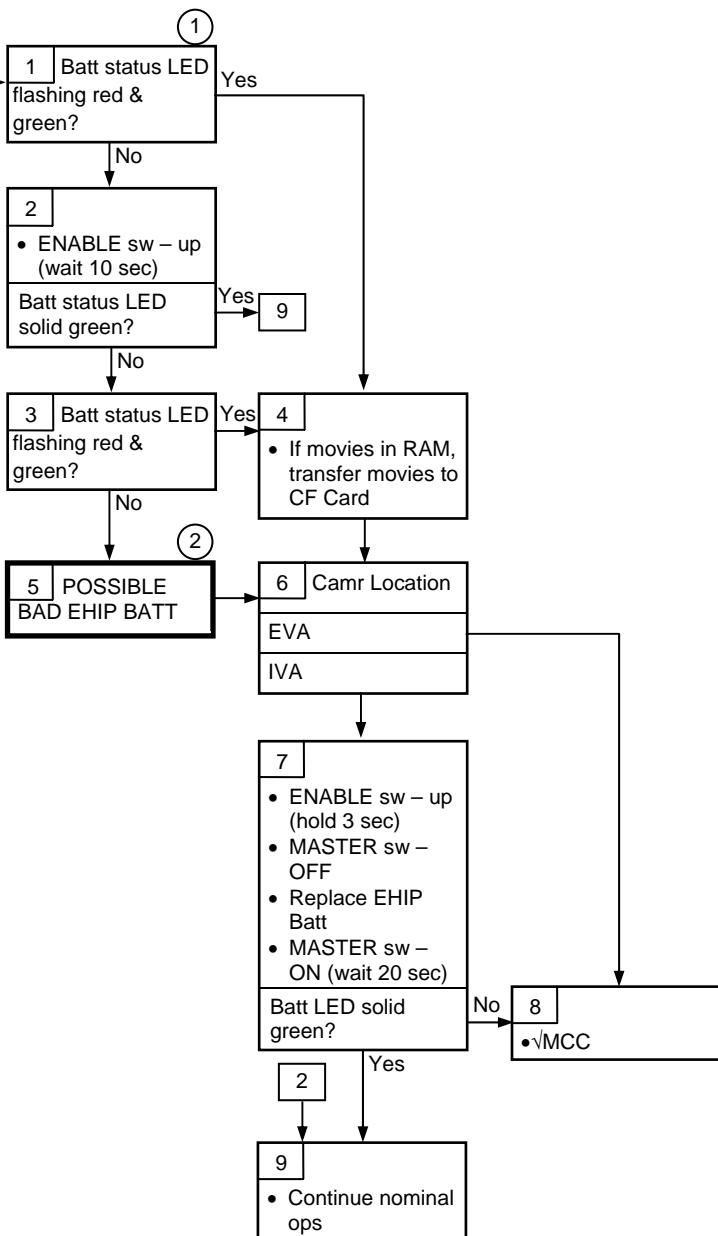
IR CAMR

6.3 BATT LED NOT SOLID GREEN

I

Batt LED Not Solid Green

Nominal Config:
 (Camr)
 EHIP – install
 CF Card – install
 Lens Cover – fold to left
 MASTER sw – ON
 √“Level/Span: Manual” or “Manual” not display on LCD
 (RCU Menu – Burst Setup)
 √Max # frames: 300
 √Save every: 12 frame



①
 Flashing red & green LED indicates that 75% of Batt has been used

②
 ENABLE sw is a momentary sw

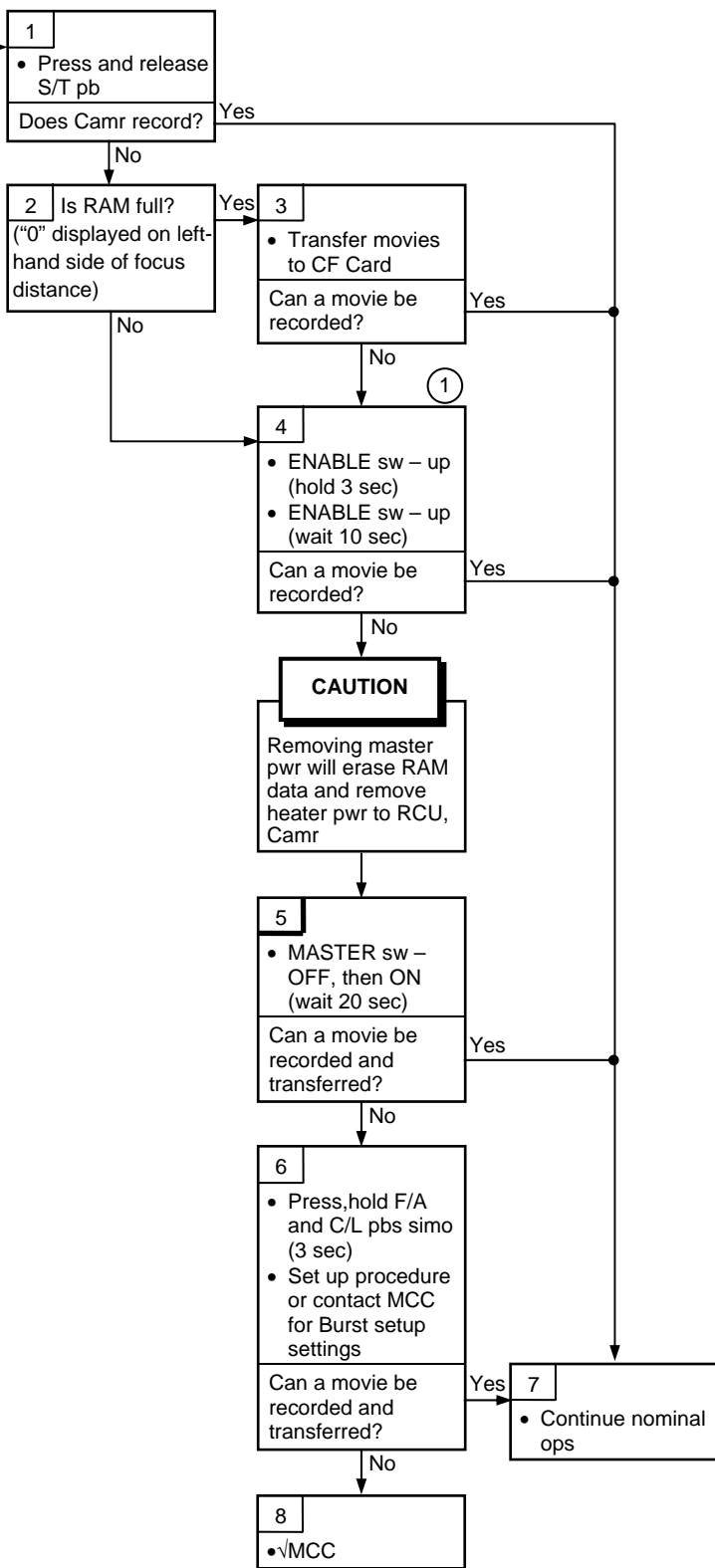
IR CAMR

6.4 IR CAMR WILL NOT RECORD

IR Camr Will Not Record

Nominal Config:
 (Camr)
 EHIP – install
 CF Card – install
 Lens Cover – fold to left
 MASTER sw – ON
 √“Level/Span: Manual” or “Manual” not display on LCD

(RCU Menu – Burst Setup)
 √Max # frames: 300
 √Save every: 12 frame



①
 ENABLE sw is a momentary sw

IR CAMR

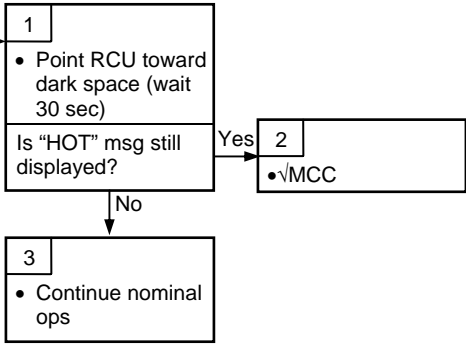
6.5 WHITE LCD WITH "HOT" TEXT

I

White LCD With "Hot" Text

Nominal Config:
(Camr)
EHIP – install
CF Card – install
Lens Cover – fold to left
MASTER sw – ON
√“Level/Span: Manual” or “Manual” not display on LCD

(RCU Menu – Burst Setup)
√Max # frames: 300
√Save every: 12 frame



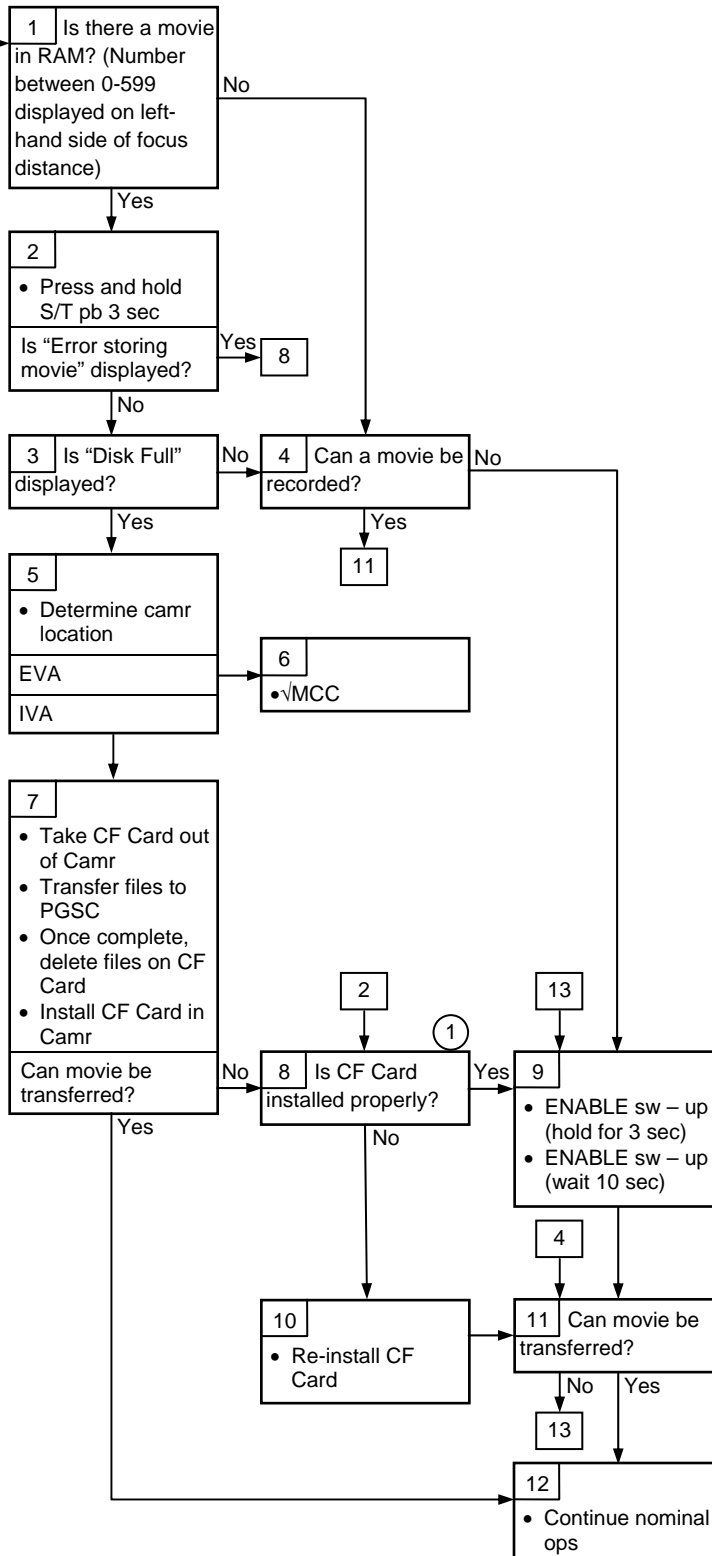
IR CAMR

6.6 MOVIE TRANSFER ERROR

Movie Transfer Error

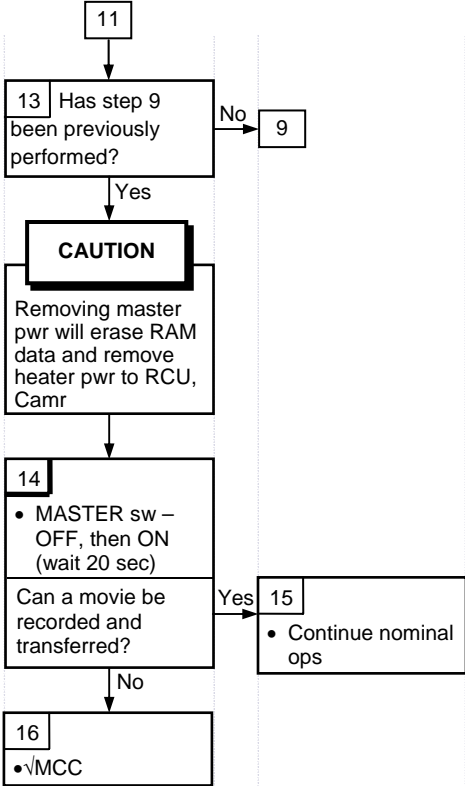
Nominal Config:
(Camr)
EHIP – install
CF Card – install
Lens Cover – fold to left
MASTER sw – ON
√“Level/Span: Manual” or “Manual” not display on LCD

(RCU Menu – Burst Setup)
√Max # frames: 300
√Save every: 12 frame



①
If CF Card not properly installed, Burst record settings are not configurable via menu

IR CAMR 6.6 (Cont)



SONY PD100

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SONY PD100

SONY PD100

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 Electret 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

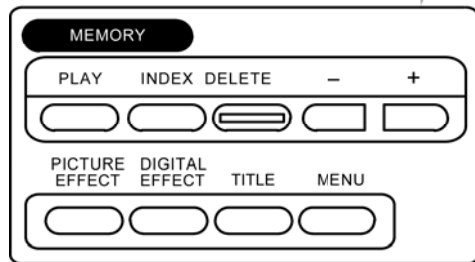
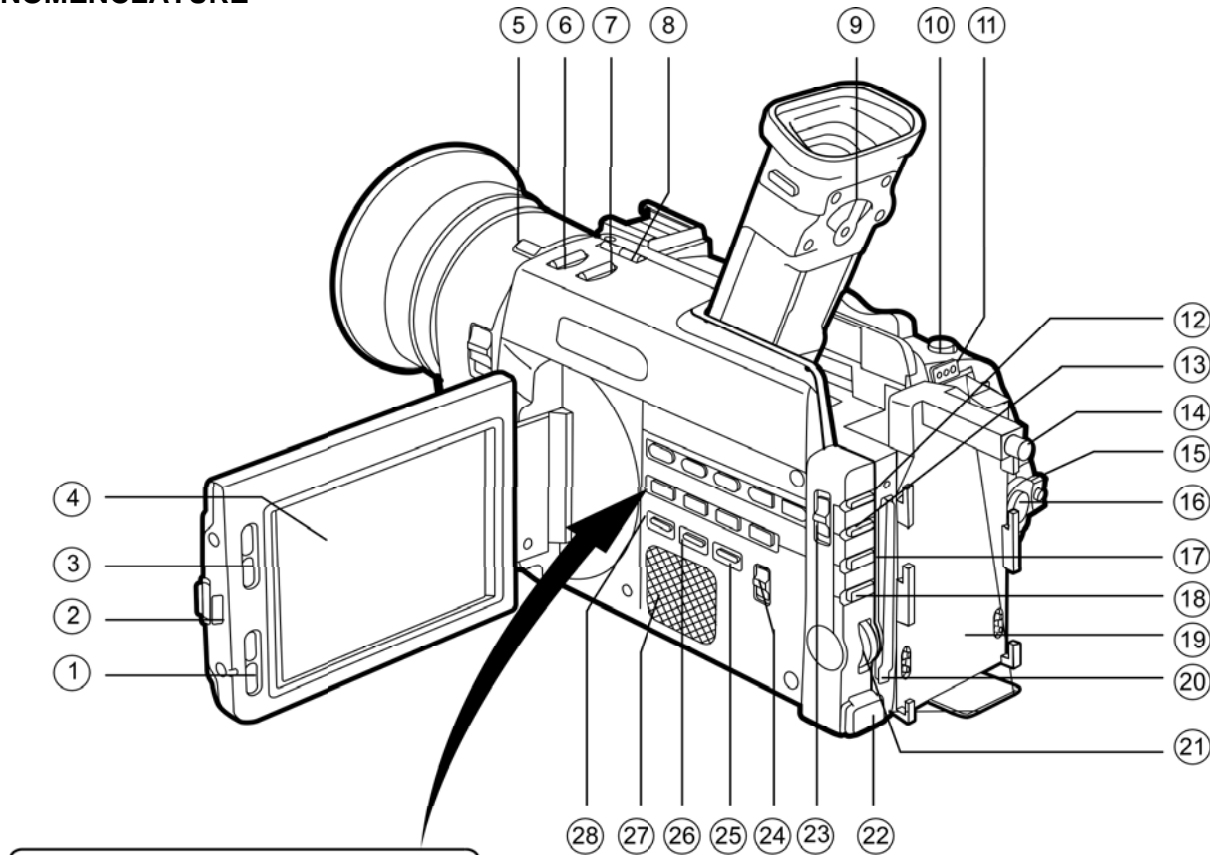
CONVERSION: 0.7X
CONVERTED FOCAL LENGTH: 3.01mm to 36.2mm
WEIGHT: 0.53 lb

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)

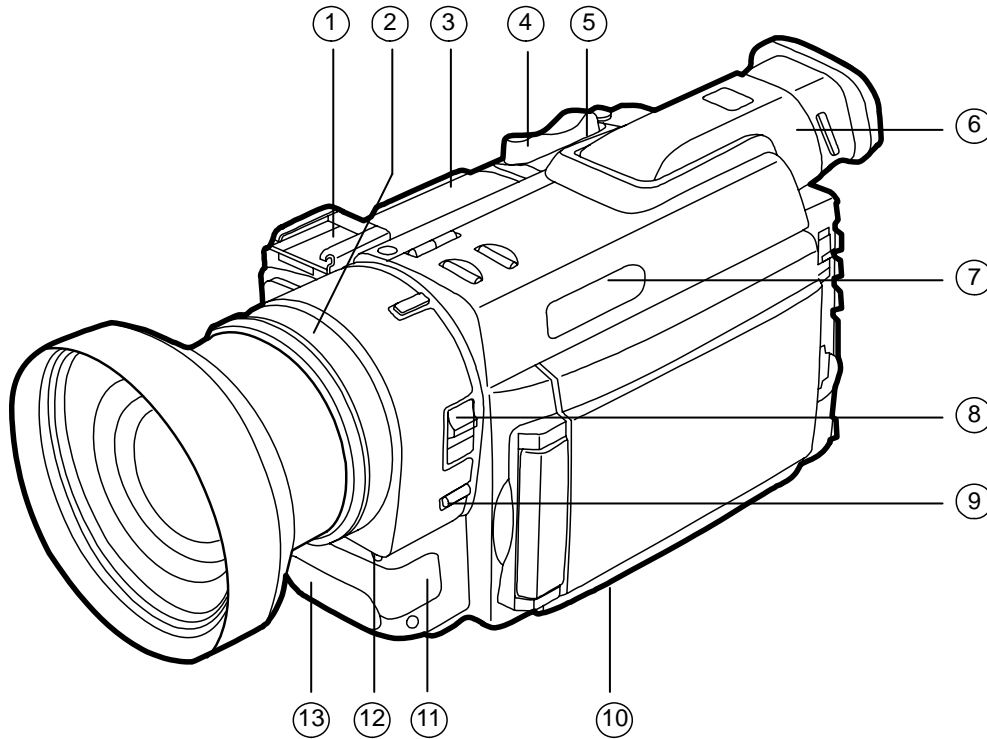
NOMENCLATURE



- ① VOLUME pb
- ② LCD OPEN sw
- ③ LCD BRIGHT pb
- ④ LCD Screen
- ⑤ ND FILTER pb
- ⑥ FADER pb
- ⑦ BACK LT pb
- ⑧ EDIT/SEARCH pb
- ⑨ Viewfinder Lens Adjustment Lever
- ⑩ PHOTO pb
- ⑪ BATT RELEASE pb
- ⑫ SHUTTER SPEED pb
- ⑬ WHT BAL (White Balance) pb
- ⑭ POWER SUPPLY RELEASE pb
- ⑮ POWER sw
- ⑯ START/STOP pb
- ⑰ PROGRAM AE pb
- ⑱ EXPOSURE pb
- ⑲ Batt Adapter
- ⑳ Memory Card Slot
- ㉑ Control tw
- ㉒ DC IN
- ㉓ AUTO LOCK Selector
- ㉔ ZEBRA Selector
- ㉕ END SEARCH pb
- ㉖ DISPLAY pb
- ㉗ Speaker
- ㉘ DATA CODE pb
- ㉙ Tape Remaining
- ㉚ Manual Focus
- ㉛ White Balance Icon

SONY PD100 (Continued)

NOMENCLATURE (Continued)

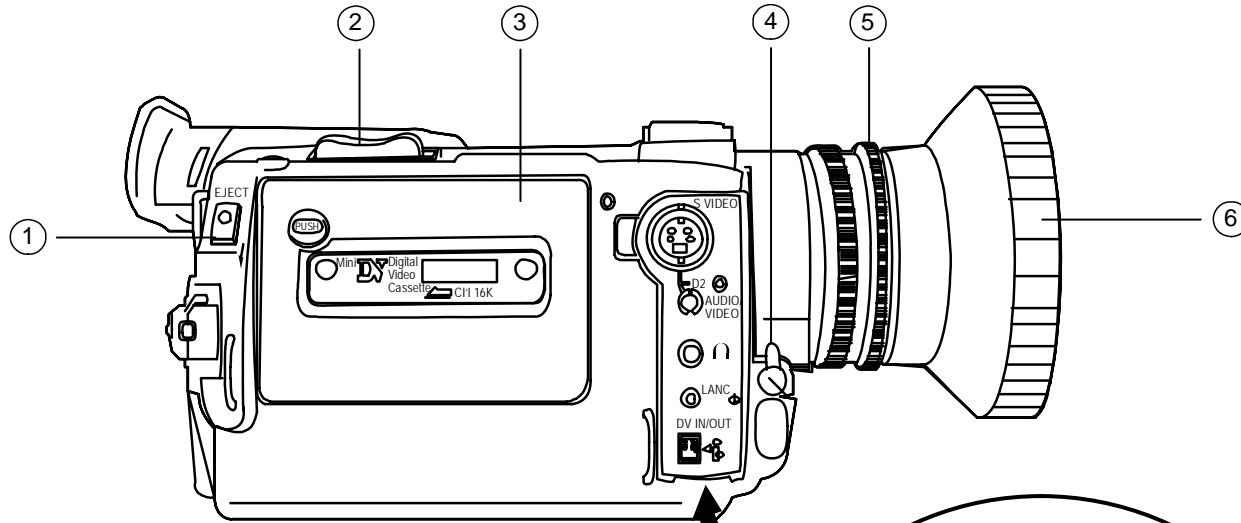


- ① Accessory Shoe
- ② Focus Ring
- ③ Tape Transport pbs
 - STOP (stop)
 - ◀◀ REW (rewind)
 - ▷ PLAY (playback)
 - ▶▶ FF (fast forward)
 - || PAUSE (pause)
 - REC (record)
- ④ Zoom Control
- ⑤ TC RESET pb
- ⑥ Viewfinder
- ⑦ Display Window
- ⑧ FOCUS sw
- ⑨ PUSH AUTO pb
- ⑩ Memory Release pb (not visible)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

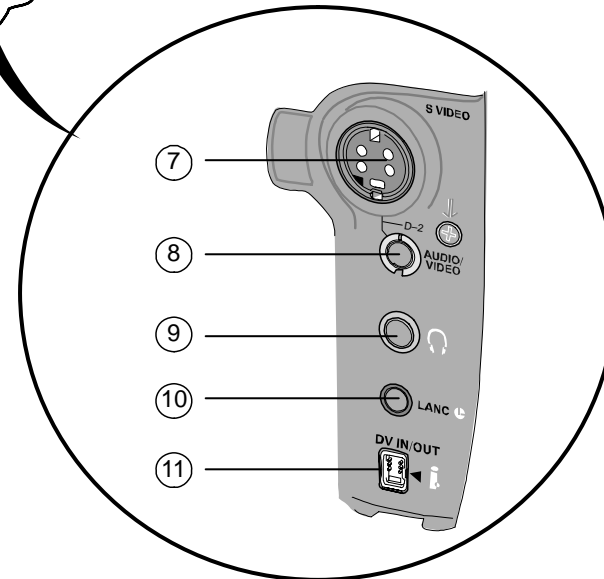
jsc48037_026.cnv

SONY PD100 (Continued)

NOMENCLATURE (Continued)



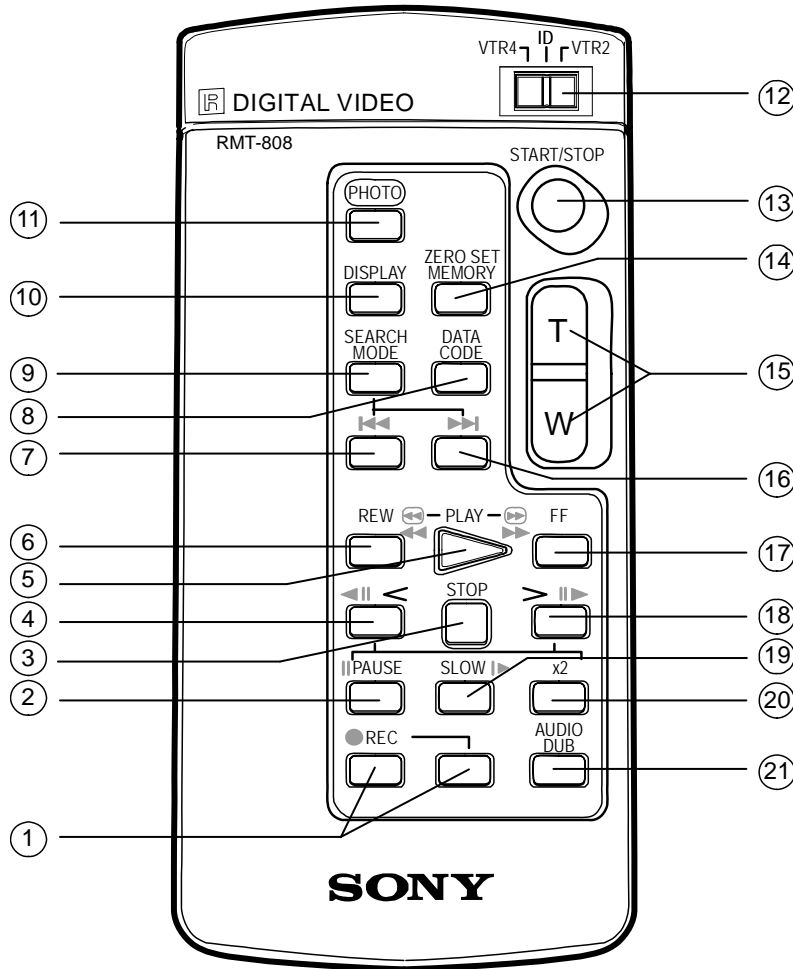
- ① Cassette Eject
- ② Zoom Control
- ③ Cassette Compartment
- ④ MIC PLUG-IN Pwr
- ⑤ Wide Conversion Locking Collar
- ⑥ Wide Conversion Lens



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SONY PD100 (Continued)

NOMENCLATURE (Concluded)



- ① REC pb
- ② PAUSE pb
- ③ STOP pb
- ④ Frame by Frame Reverse pb
- ⑤ PLAY pb
- ⑥ REW pb
- ⑦ REW Search pb
- ⑧ DATA CODE pb
- ⑨ SEARCH Mode pb
- ⑩ DISPLAY pb
- ⑪ PHOTO pb
- ⑫ VTR SELECT
- ⑬ START/STOP pb
- ⑭ ZERO SET MEMORY pb (not used)
- ⑮ Zoom Controls
- ⑯ FF Search pb
- ⑰ FF pb
- ⑱ Frame by Frame FF pb
- ⑲ SLOW pb
- ⑳ X2 pb
- ㉑ AUDIO DUB pb

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SONY PD100 (Continued)

NOMINAL MENU SETTINGS

CAMR MODE

MANUAL SET

AUTO SHUTTER – ON
PROG SCAN – OFF

CAMR SET

D.ZOOM – OFF (non-default)
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
LCD COLOR – “center”
VF BRIGHT – “center”

CM SET

N/A

TAPE SET

AUDIO MODE – FS48K (non-default)
MIC LEVEL – AUTO
ⓈⓈ REMAIN – ON (non-default)
TIME CODE – DF

SETUP MENU

CLOCK SETUP – set to GMT
LTR SIZE – NORMAL

OTHER

WORLD TIME – 0 HR
BEEP – NORMAL (non-default)
COMMANDER – ON
DISPLAY – LCD
REC LAMP – OFF (non-default)
COLOR BAR – OFF

VTR MODE

VTR SET

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

LCD/VF SET

LCD B.L. – BRT Normal
LCD COLOR – “center”
VF BRIGHT – “center”

MEMORY SET

N/A

CM SET

N/A

TAPE SET

AUDIO MODE – FS48K (non-default)
MIC LEVEL – AUTO
ⓈⓈ REMAIN – ON
DATA CODE – DATE/CAM
TIME CODE – DF

SETUP MENU

LTR SIZE – NORMAL

OTHER

BEEP – NORMAL (non-default)
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

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

√No SS 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

APERTURE

PWR – CAMERA

AUTO LOCK – “center”

PROGRAM AE pb – press

√ displayed

CONTROL tw – press

Adjust aperture as reqd

To exit Aperture:

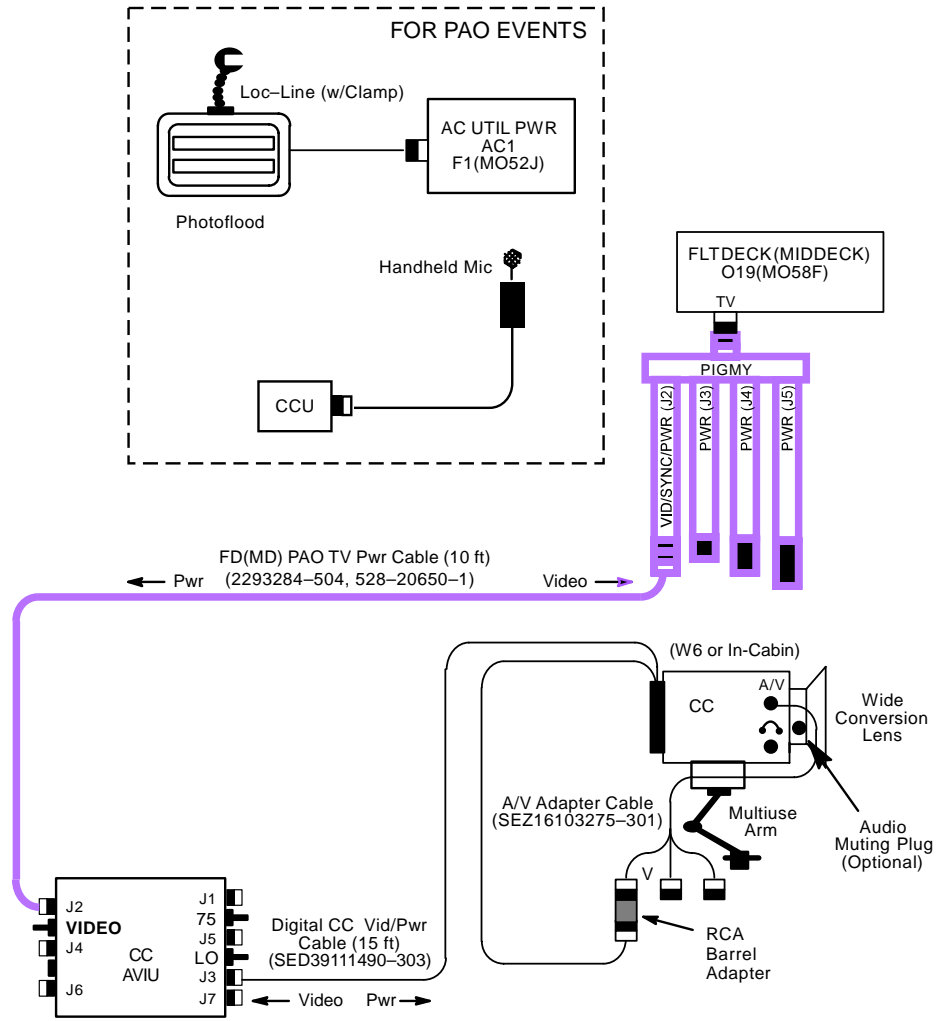
PROGRAM AE pb – press

√No  displayed

SONY PD100 (Continued)

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
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 dnk:
✓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



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SONY PD100 (Continued)

DIGITAL PAO CC

- Config H/W per dwg at right

To compose scene but not dnk:
 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

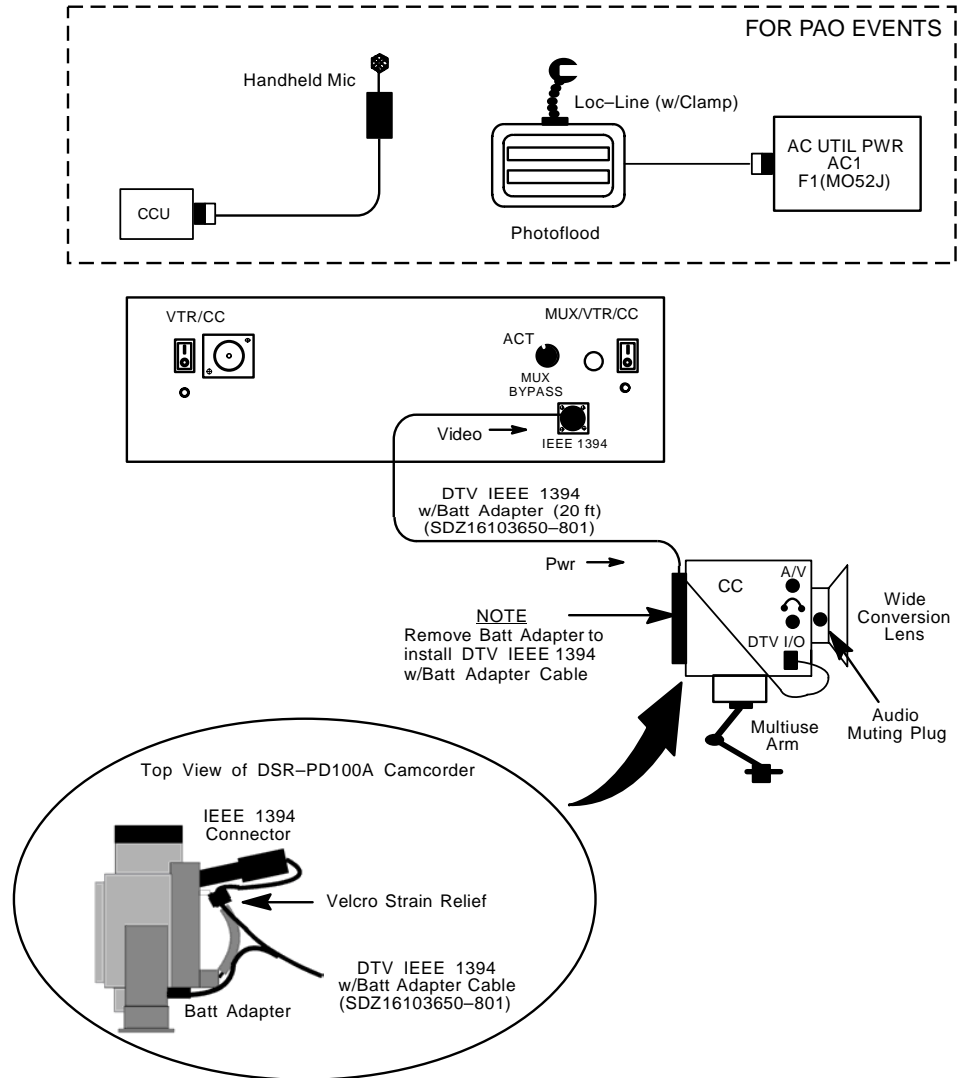
 - Flt Deck – ON
 - Lts in FOV – OFF as reqd
 - Lt Shades – install as reqd
 - Window Shades – install as reqd
- CC

 - √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 dnk signal:
 - MUX/VTR/CC PWR – on (LED on)
 - √MUX BYPASS – ACT
 - √CHANNEL 3 DATA LED – on



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SONY PD100 (Continued)

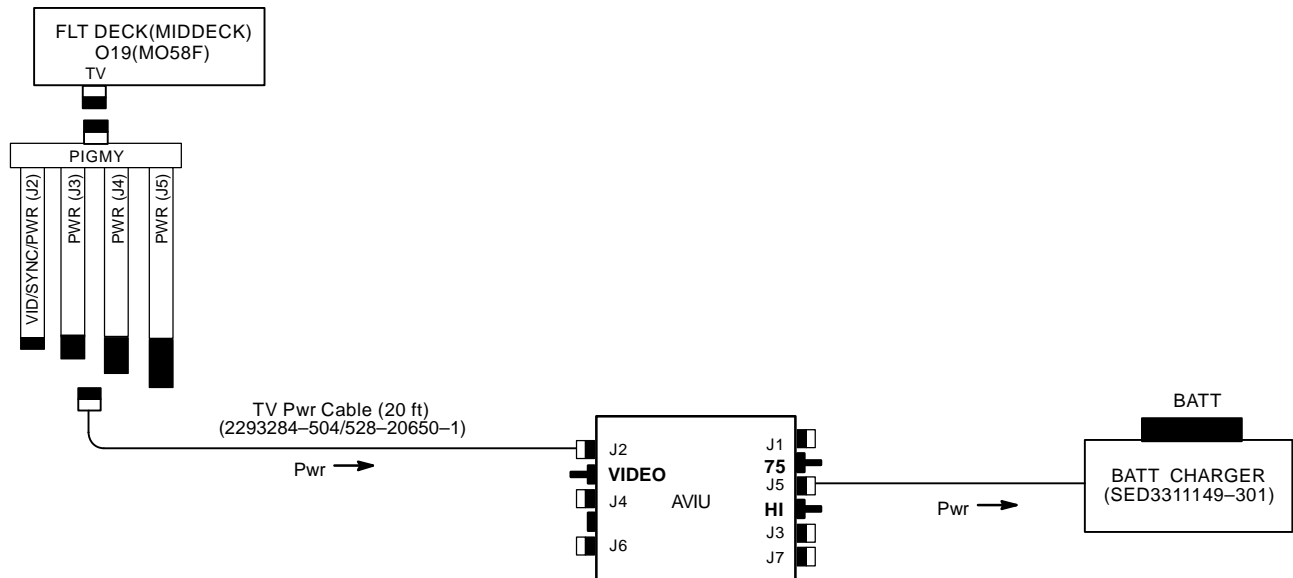
CC BATT CHARGING

1. Config H/W per dwg below
2. SYNC/VIDEO – VIDEO
HI-Z/75 – 75
PWR SELECT – HI

NOTE

When batt charger not in use, remove pwr

3. $\sqrt{\text{TV PWR}}$ – ON
4. Insert Batt in charger. Check charger LED for charge status (~2 hr)



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SONY PD100 (Continued)

PD100 TO PD100 VIA FIREWIRE

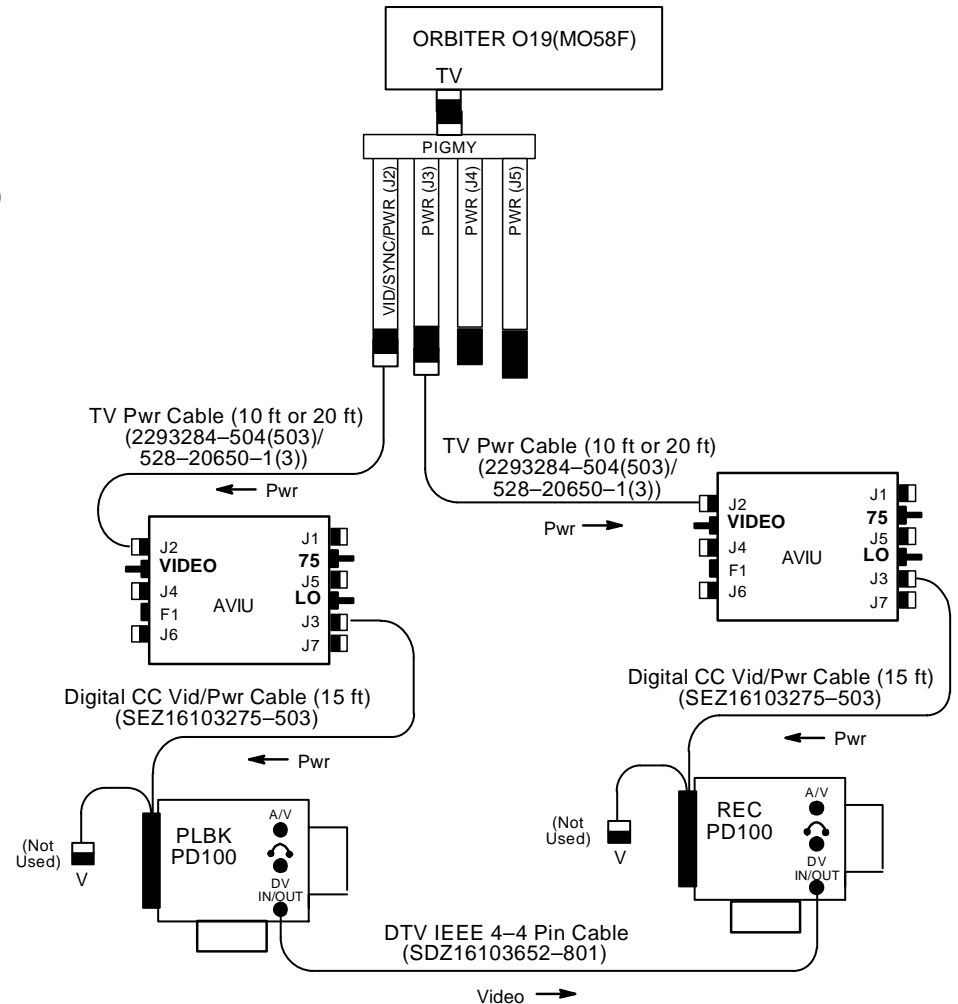
Config H/W per dwg at right

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

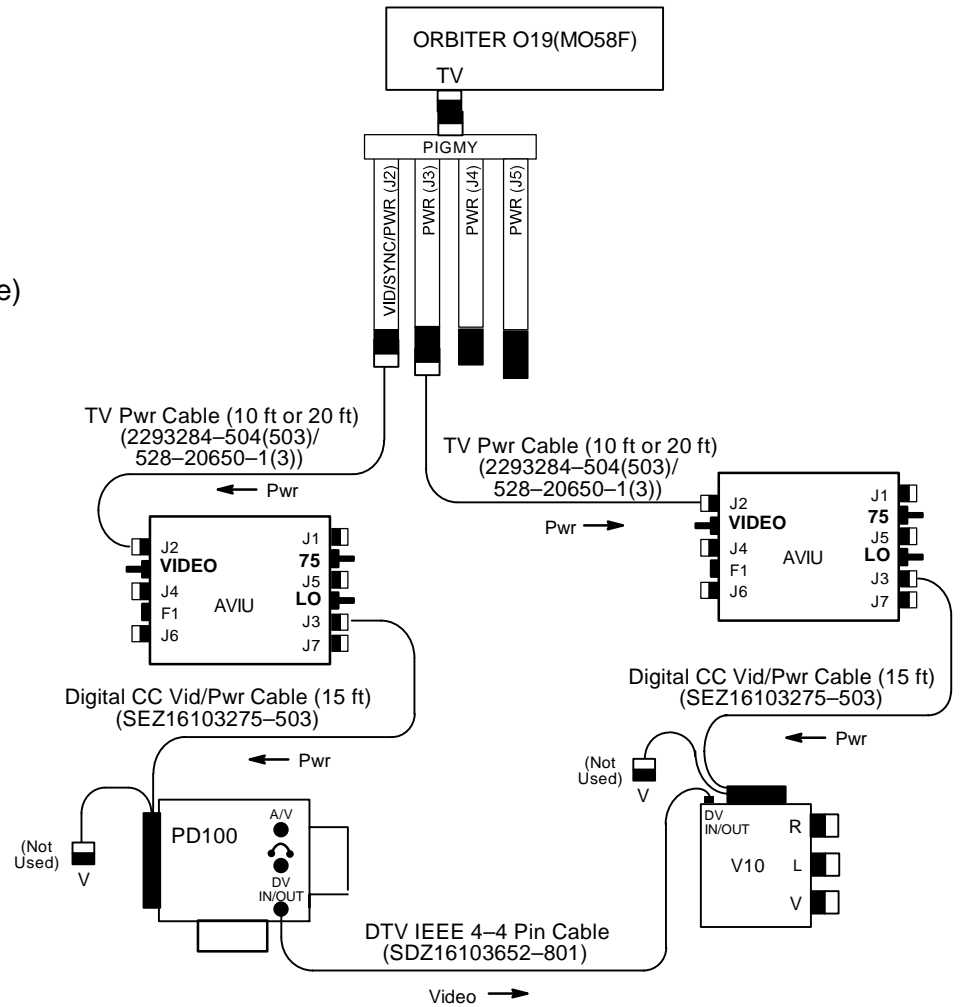


jsc48037_029.cnv

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.cvx

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

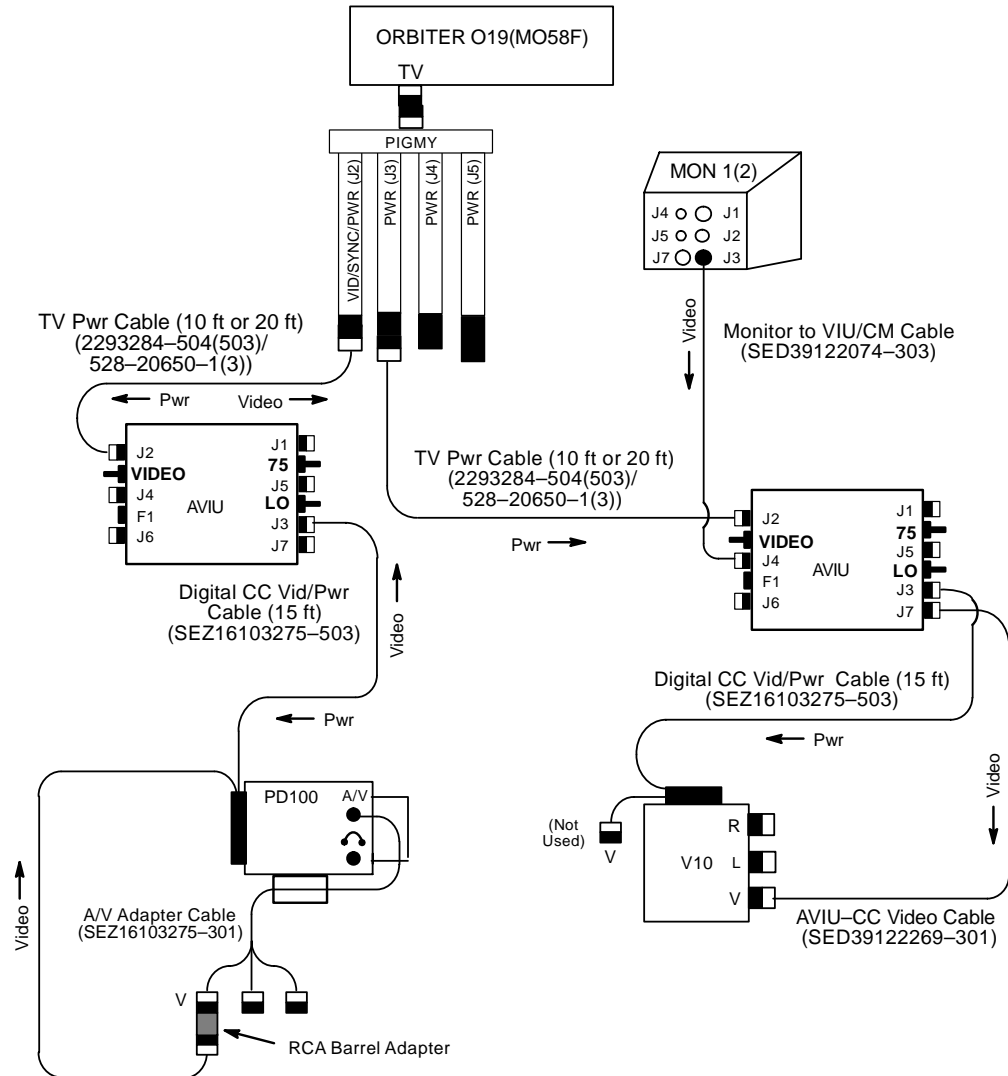
O19(MO58F) ✓TV PWR – ON

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



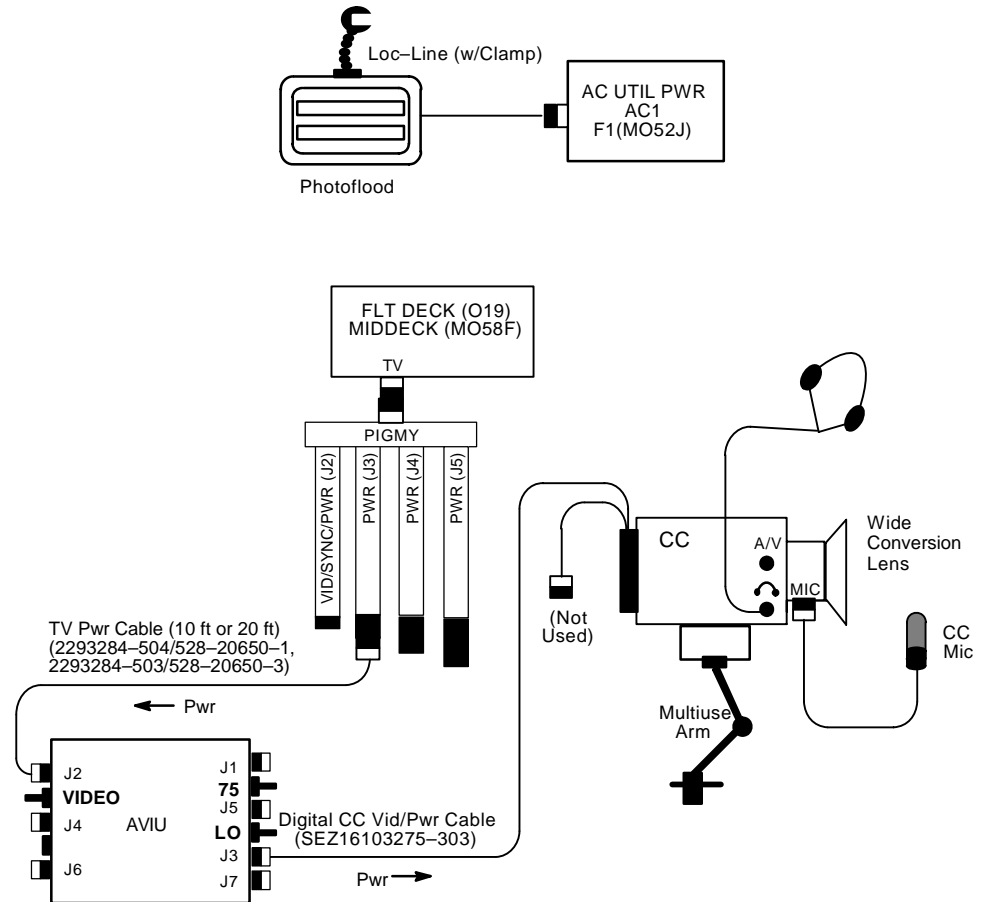
jsc48037_031.cnv

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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SONY V10

SONY V10

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

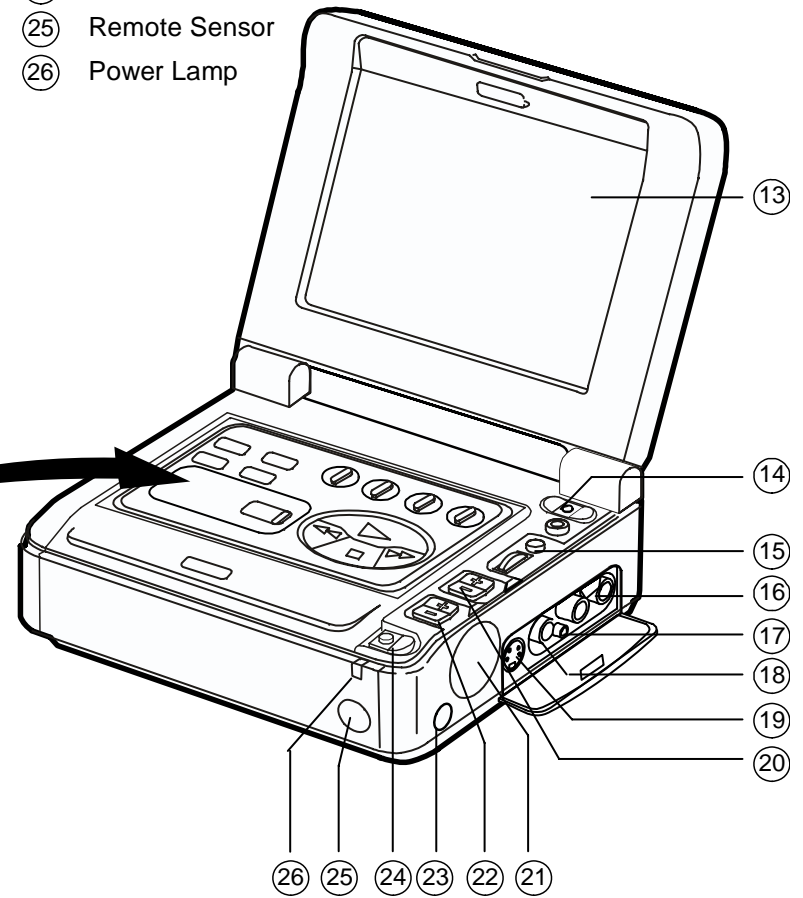
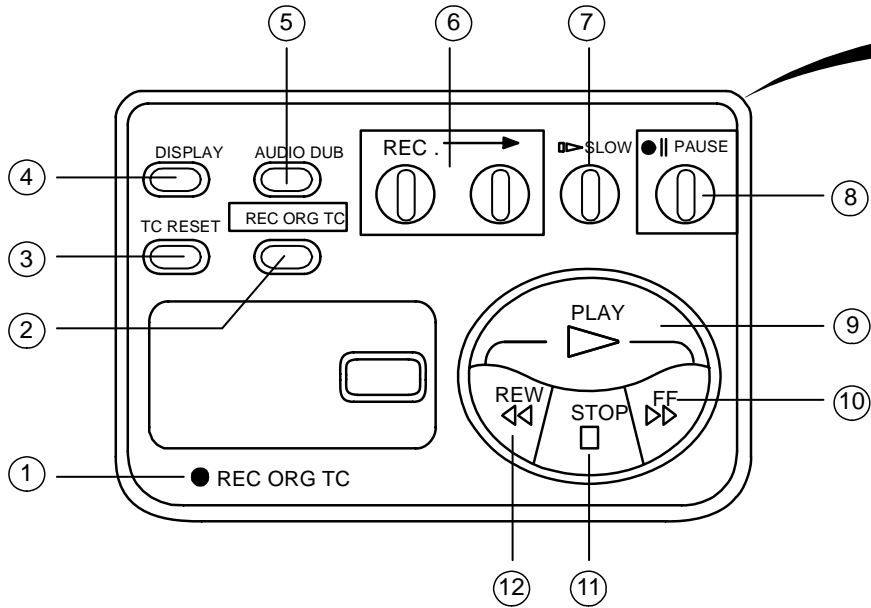
BODY WEIGHT: 2.00 lb

BATT WEIGHT: 0.41 lb

SONY V10 (Continued)

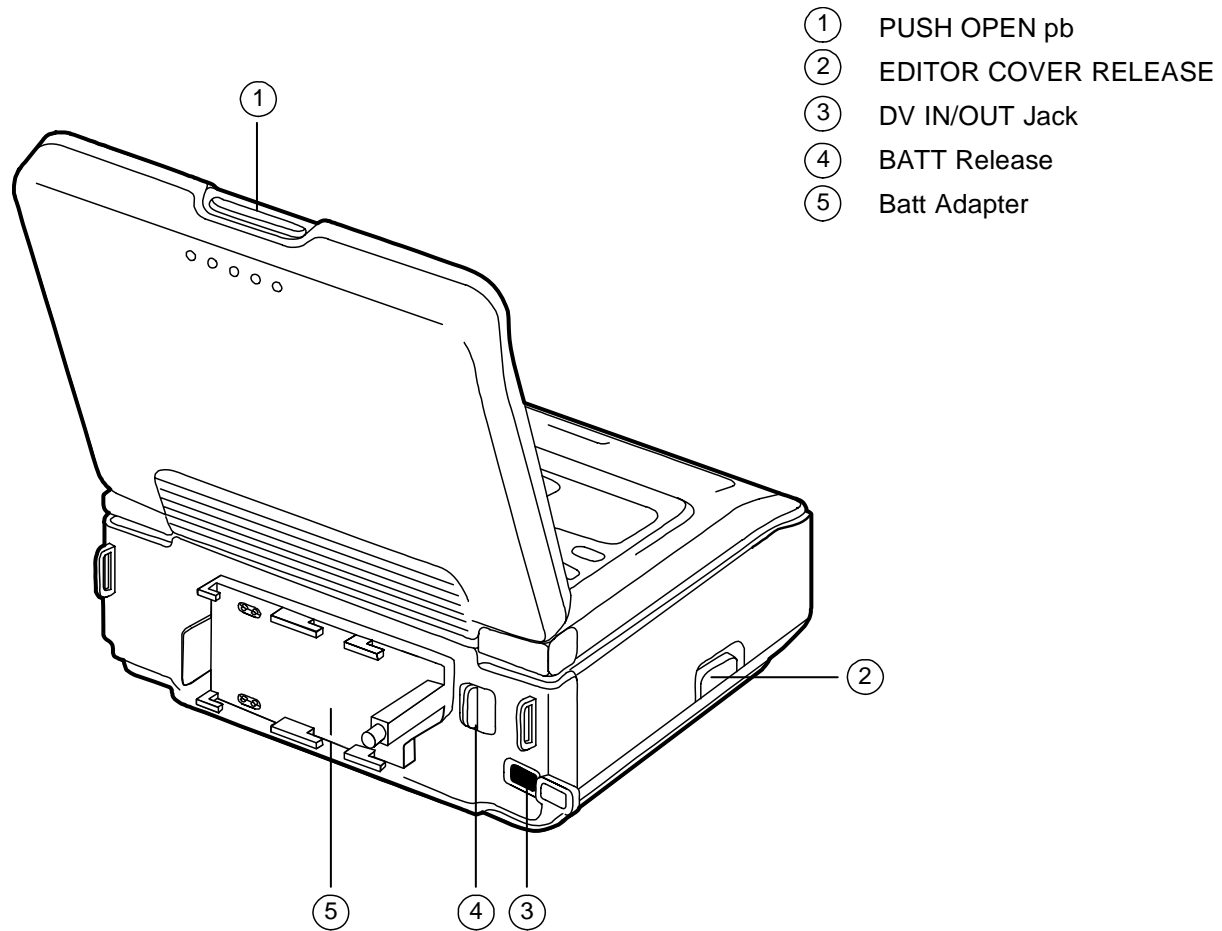
NOMENCLATURE

- | | | |
|-------------------------------|----------------------------------|------------------|
| ① REC ORG TC Lamp | ⑫ REW (rewind) pb | ⑳ Headphone Jack |
| ② REC ORG TC pb | ⑬ LCD Screen | ㉑ EJECT sw |
| ③ TC Reset pb | ⑭ POWER sw | ㉒ Remote Sensor |
| ④ DISPLAY pb | ⑮ MENU pb, Control dial | ㉓ Power Lamp |
| 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 | ㉀ S VIDEO Input/Output Jack | |
| ⑨ PLAY (playback) pb | ㉁ LCD BRIGHT pb | |
| ⑩ FF (fast Forward) pb | ㉂ Speaker | |
| ⑪ STOP pb | ㉃ Volume pb | |



SONY V10 (Continued)

NOMENCLATURE (Concluded)



jsc48037_038.cnv

SONY V10 (Continued)

NOMINAL MENU SETTINGS

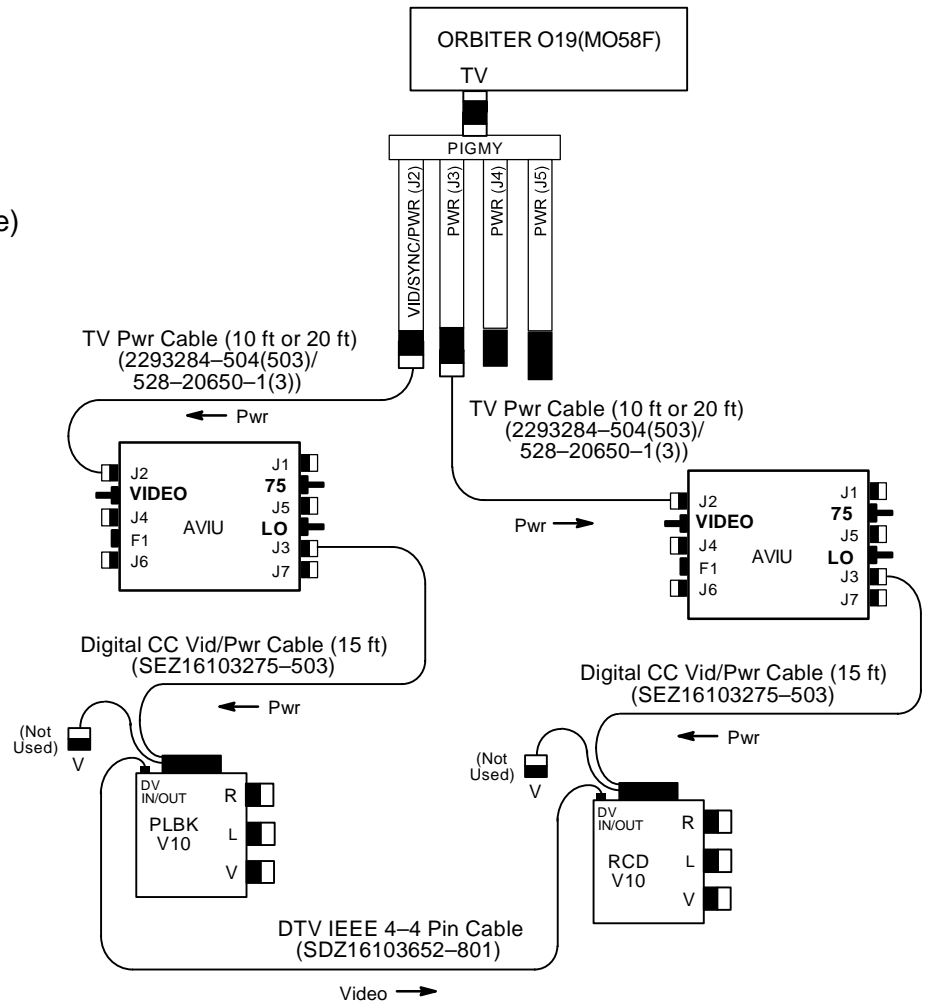
CMD – VTR4
HiFi SOUND – STEREO
AUDIO MODE – FS48K (non-default)
TIME CODE – DF
BEEP – ON
AUDIO MIX – “left” (ST1)
CM SEARCH – ON
DATA CODE – DATE/CAM
LCD COLOR – “center”
LCD HUE – “center”
DISPLAY – LCD
JOG AUDIO – OFF
CLOCK SET – set to GMT

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:
PAUSE pb – push (To PLAY) |
| RCD V10 | PAUSE pb – push (To REC) |
| PLBK V10 | When EDIT segment complete:
PAUSE pb – push (PAUSE) |
| RCD V10 | PAUSE pb – push (PAUSE) |



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PORTABLE MONITORS

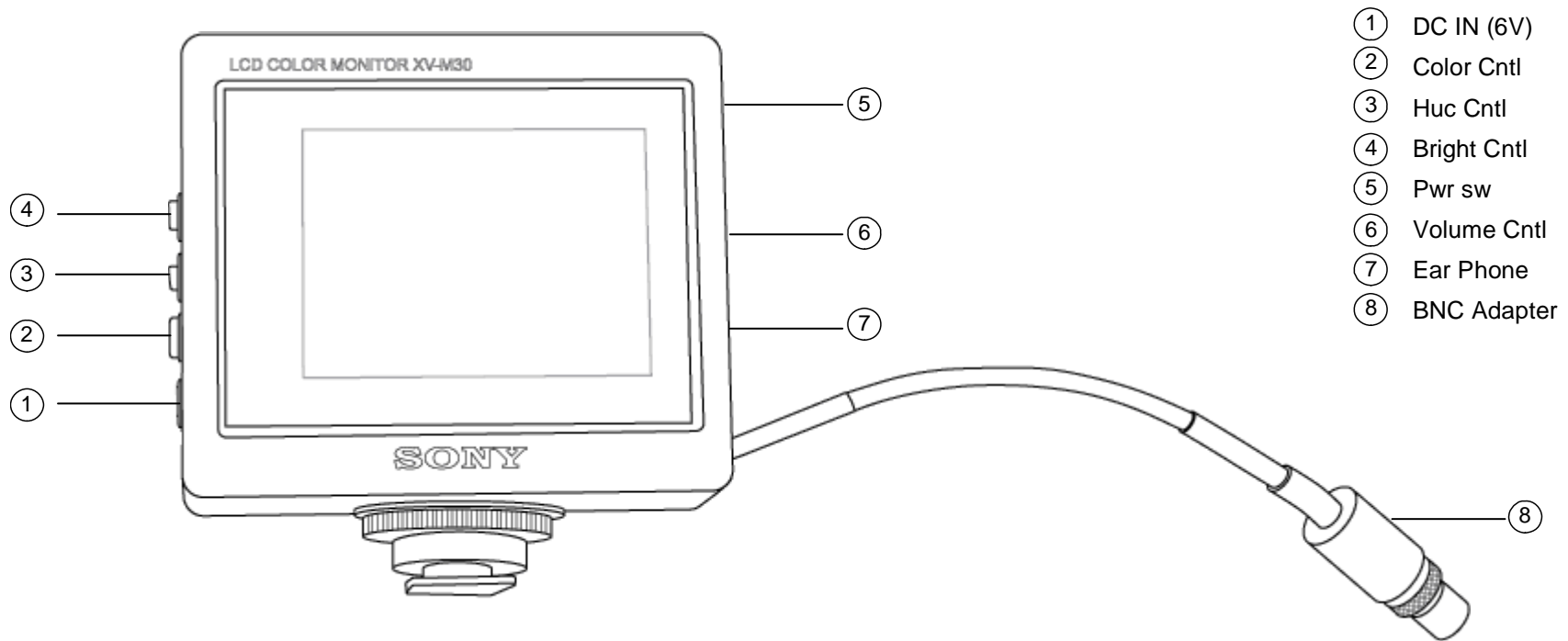
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PORTABLE MONITORS

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




- ① DC IN (6V)
- ② Color Cntl
- ③ Huc Cntl
- ④ Bright Cntl
- ⑤ Pwr sw
- ⑥ Volume Cntl
- ⑦ Ear Phone
- ⑧ BNC Adapter

Sony XV-M30

jsc48037_041.cnv

PORTABLE MONITORS (Continued)

A31p VIDEO CONVERTER

- A31p
1. √A31p Pwr – ON
 2. Connect A31p Video Adapter to A31p VID IN “”
 3. Connect appropriate hardware from video source to A31p Video Adapter Cable depending on desired video source per table below

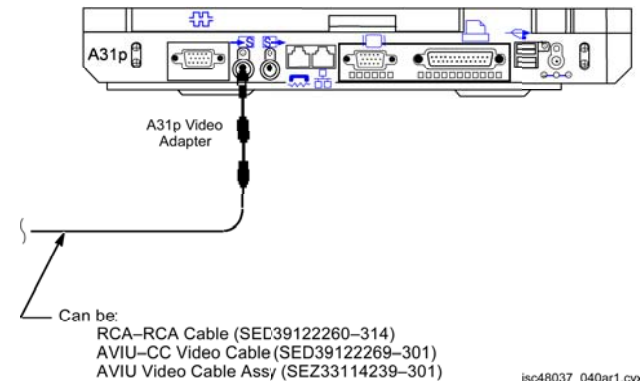
Video Source	Hardware (part #)	From	To	Cable Connections
PAYLOAD/DTV	• AVIU-CC Video Cable (15 ft) (SED39122269-301)	• L10A1 VTR OUT	• A31p Video Adapter	• BNC – RCA
Monitor 1(2) (option 1)	• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303) • AVIU (SED33111493-302/303) • AVIU Video Cable Assy (SEZ33114239-301)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

PORTABLE MONITORS (Continued)

A31p VIDEO CONVERTER (Concluded)

Video Source	Hardware (part #)	From	To	Cable Connections
ISS	<ul style="list-style-type: none"> • VPU Patch Cable (SED39136025-301) • Balanced Video Cable (SED33105778-301) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301) 	<ul style="list-style-type: none"> • VPU FROM ISS • VPU Patch Cable ----- • Bal/Unbal Xfmr 	<ul style="list-style-type: none"> • Balanced Video Cable • Bal/Unbal Xfmr ----- • A31p Video Adapter 	<ul style="list-style-type: none"> • Plug – Twinax • Twinax – Twinax ----- • BNC – RCA
Spare 1 (SSV)	<ul style="list-style-type: none"> • SSV to PDIP/CIP Cable (SED16103246-301) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301) 	<ul style="list-style-type: none"> • L11A2 PDIP/J107 ----- • Bal/Unbal Xfmr 	<ul style="list-style-type: none"> • Bal/Unbal Xfmr ----- • A31p Video Adapter 	<ul style="list-style-type: none"> • Circ – Twinax ----- • BNC – RCA
WVS	<ul style="list-style-type: none"> • AVIU-CC Video Cable (15 ft) (SED39122269-301) 	<ul style="list-style-type: none"> • R12A2 WIB XCVR1(2) UNBAL 	<ul style="list-style-type: none"> • A31p Video Adapter 	<ul style="list-style-type: none"> • BNC – RCA
PD100 Camc (option 1)	<ul style="list-style-type: none"> • PD100 A/V Adapter Cable (SEZ16103275-301) • RCA - RCA Cable (SED39122260-314) 	<ul style="list-style-type: none"> • PD100 A/V Port • A/V Adapter 	<ul style="list-style-type: none"> • RCA-RCA Cable (via female adapter) • A31p Video Adapter 	<ul style="list-style-type: none"> • Stereo – RCA • RCA – RCA
PD100 Camc (option 2)	<ul style="list-style-type: none"> • Y-C Cable (SED33104816-301) 	<ul style="list-style-type: none"> • PD100 S-Video Port 	<ul style="list-style-type: none"> • A31p Video In Port (No A31p Video Adapter) 	<ul style="list-style-type: none"> • S-Video – S-Video

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



PORTABLE MONITORS (Continued)

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 (15 ft) (SED39122269-301)	• L10A1 VTR OUT	• VID IN/OUT Cable	• BNC – RCA
Monitor 1(2) (option 1)	• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303) • AVIU (SED33111493-302/303) • AVIU Video Cable Assy (SEZ33114239-301)	• Mon/J3 ----- • AVIU/J5	• AVIU/J4 ----- • VID IN/OUT Cable	• Circ – Twinax ----- • Unique – RCA
Monitor 1(2) (option 2)	• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303) • AVIU (SED33111493-302/303) • Balanced Video Cable (SED33105778-301) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301)	• Mon/J3 ----- • AVIU/J6 • Balanced Video Cable • Bal/Unbal Xfmr	• AVIU/J4 ----- • Bal/Unbal xfmr • AVIU-CC Video Cable • VID IN/OUT Cable	• Circ – Twinax ----- • Twinax – Twinax ----- • BNC – RCA
Monitor 1(2) (option 3)	• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303) • AVIU (SED33111493-302/303) • AVIU-CC Video Cable (15 ft) (SED39122269-301)	• Mon/J3 ----- • AVIU/J7	• AVIU/J4 ----- • VID IN/OUT Cable	• Circ – Twinax ----- • BNC – RCA
Monitor 1(2) (option 4)	• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301)	• Mon/J3 ----- • Bal/Unbal Xfmr	• Bal/Unbal Xfmr ----- • VID IN/OUT Cable	• Circ – Twinax ----- • BNC – RCA

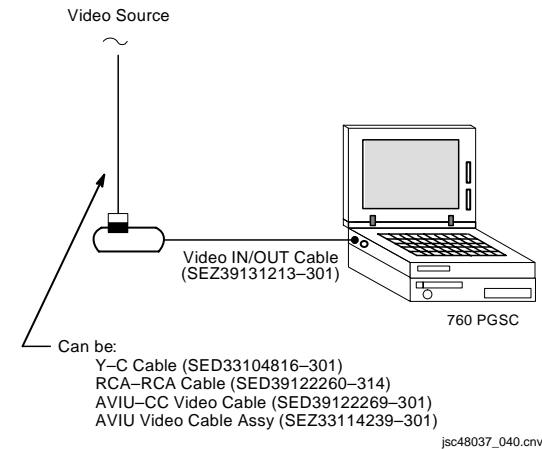
PORTABLE MONITORS (Continued)

PGSC VIDEO OVERLAY (Concluded)

Video Source	Hardware (part #)	From	To	Cable Connections
ISS	• VPU Patch Cable (SED39136025-301)	• VPU FROM ISS	• Bal/Unbal Xfmr	• Plug – Twinax
	• Balanced Video Cable (SED33105778-301) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301)	• VPU Patch Cable ----- • Bal/Unbal Xfmr	• Bal/Unbal Xfmr ----- • VID IN/OUT Cable	• Twinax – Twinax ----- • BNC - RCA
Spare 1 (SSV)	• SSV to PDIP/CIP Cable (SED16103246-301) • Bal/Unbal Xfmr (SED39124190-301) • AVIU-CC Video Cable (15 ft) (SED39122269-301)	• L11A2 PDIP/J107 ----- • Bal/Unbal Xfmr	• Bal/Unbal Xfmr ----- • VID IN/OUT Cable	• Circ – Twinax ----- • BNC – RCA
	• AVIU-CC Video Cable (15 ft) (SED39122269-301)	• R12A2 WIB XCVR1(2) UNBAL	• VID IN/OUT Cable	• BNC – RCA
PD100 Camc (option 1)	• PD100 A/V Adapter Cable (SEZ16103275-301) • RCA - RCA Cable (SED39122260-314)	• PD100 A/V Port • A/V Adapter	• RCA-RCA Cable (via female adapter) • VID IN/OUT Cable	• Stereo – RCA • RCA – RCA
PD100 Camc (option 2)	• Y-C Cable (SED33104816-301)	• PD100 S-Video Port	• VID IN/OUT Cable	• S-Video – S-Video

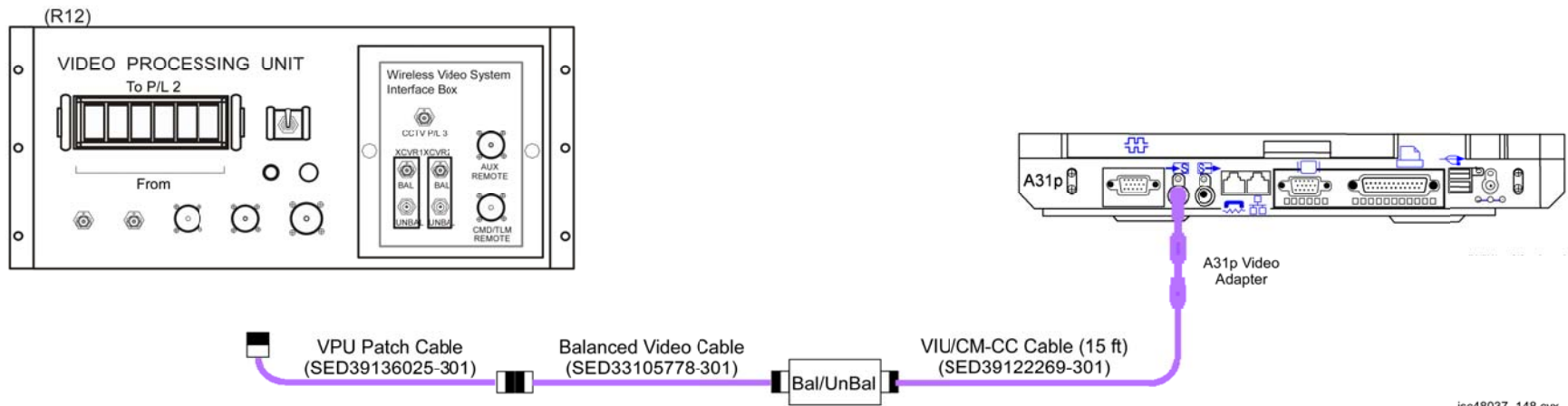
4. Config video source
5. Double-click Shuttle Apps > Video Overlay
6. ✓ Video overlay displayed

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



PORTABLE MONITORS (Concluded)

VPU REPEATER



jsc48037_148.cvx

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CCTV

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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°

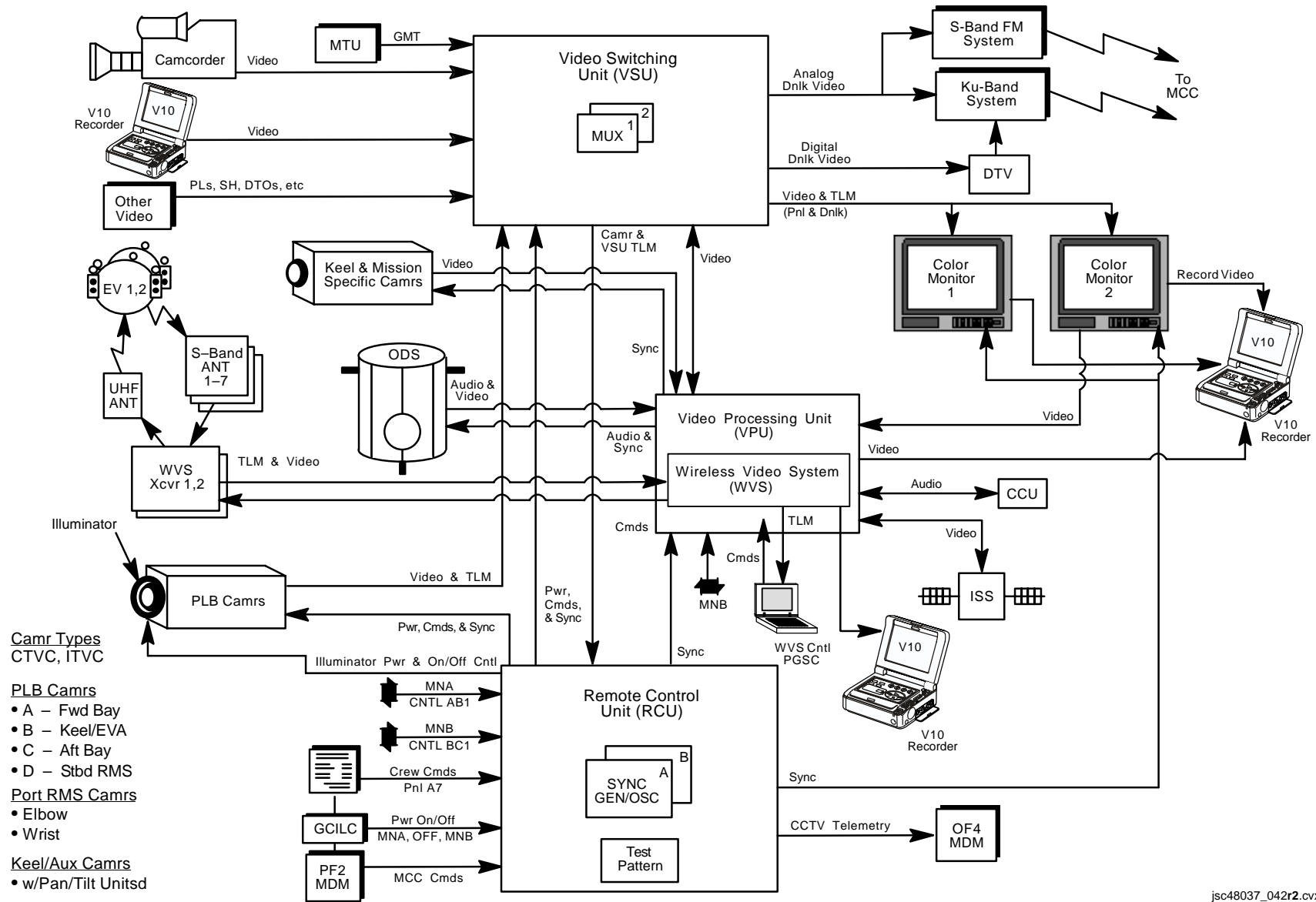
ILLUMINATOR DATA

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)

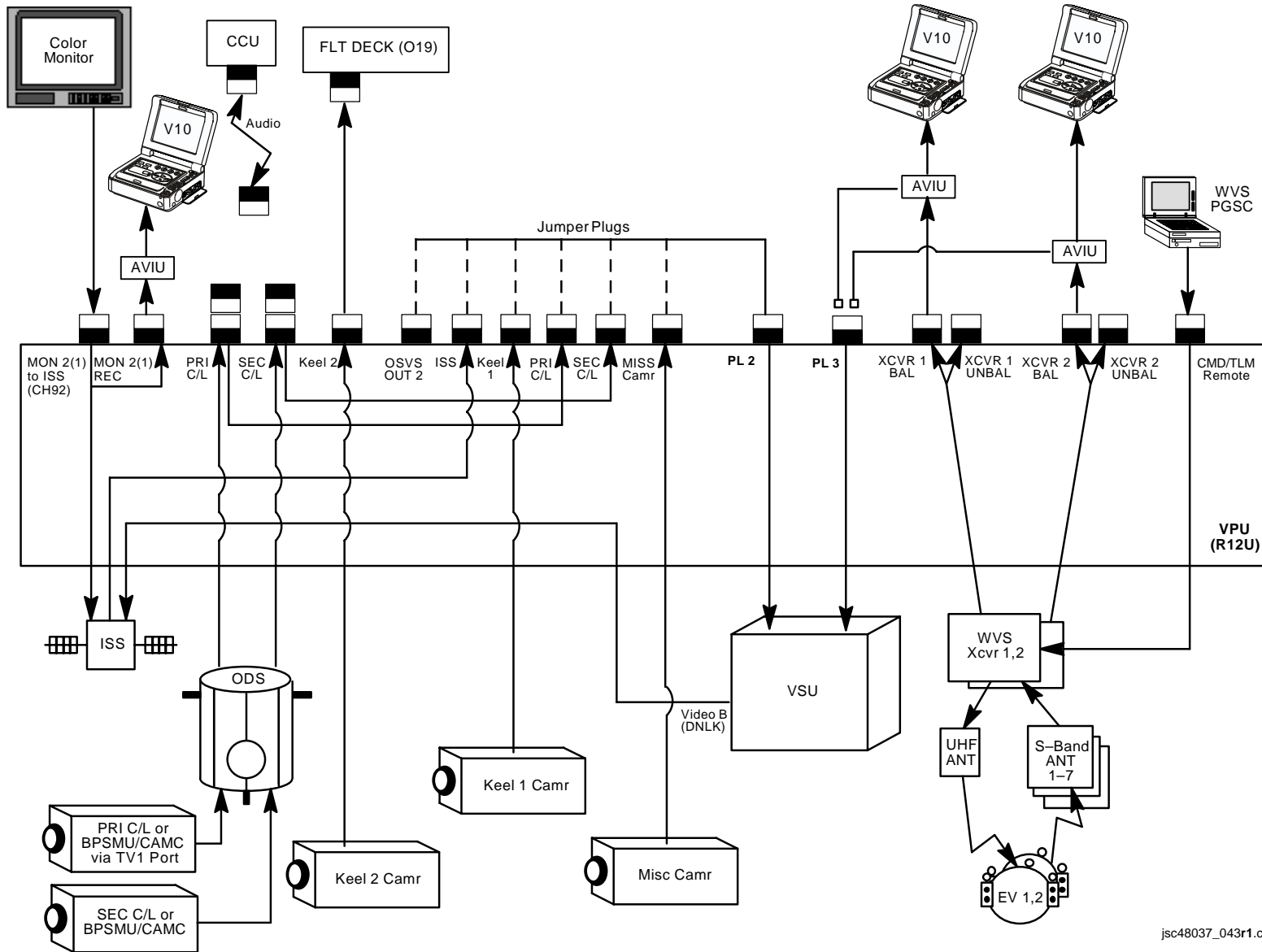
CCTV SYSTEM OVERVIEW



jsc48037_042r2.cvx

CCTV (Continued)

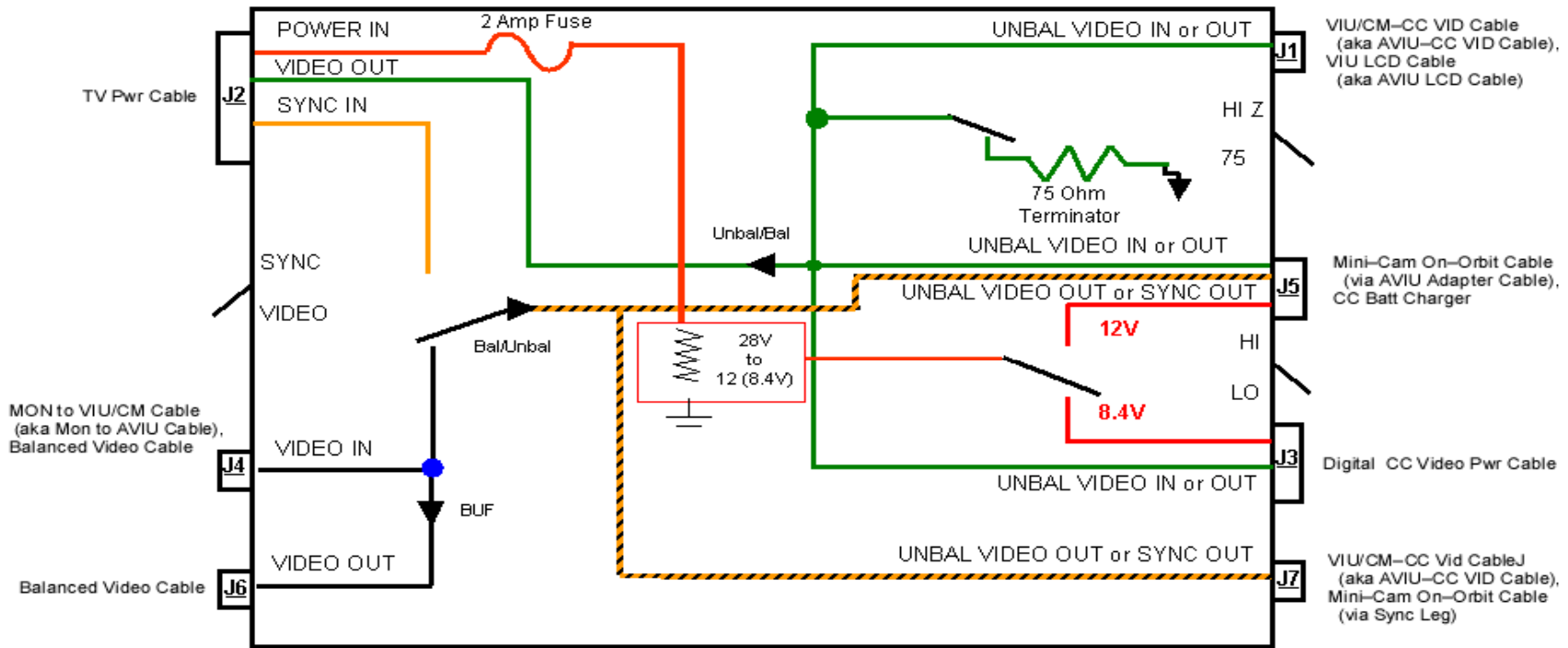
VPU/WIB VIDEO ROUTING OVERVIEW



jsc48037_043r1.cvx

CCTV (Continued)

AVIU OVERVIEW



isc48037_044r1.cvx

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

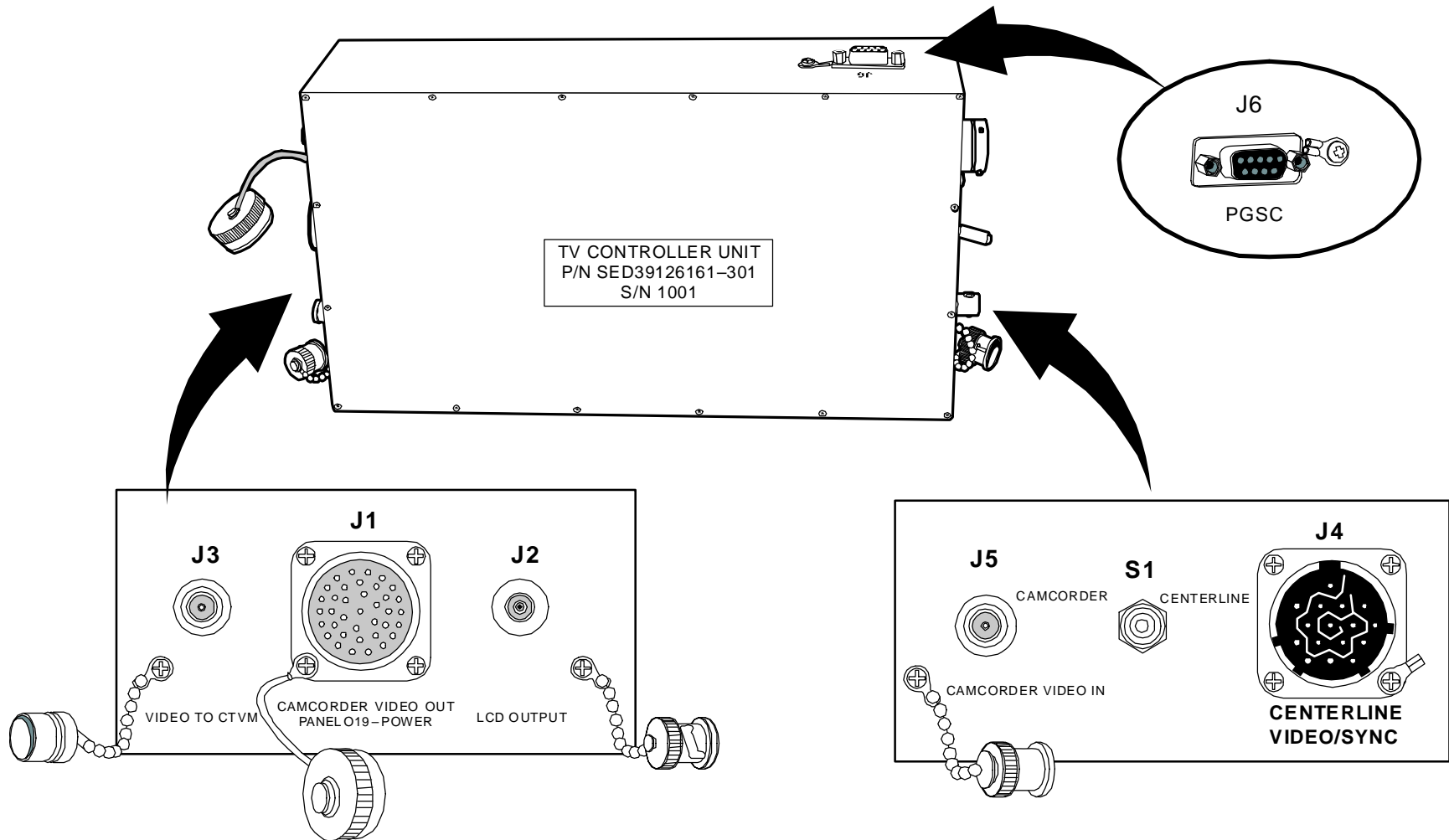
HI-Z/75 sw

- 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

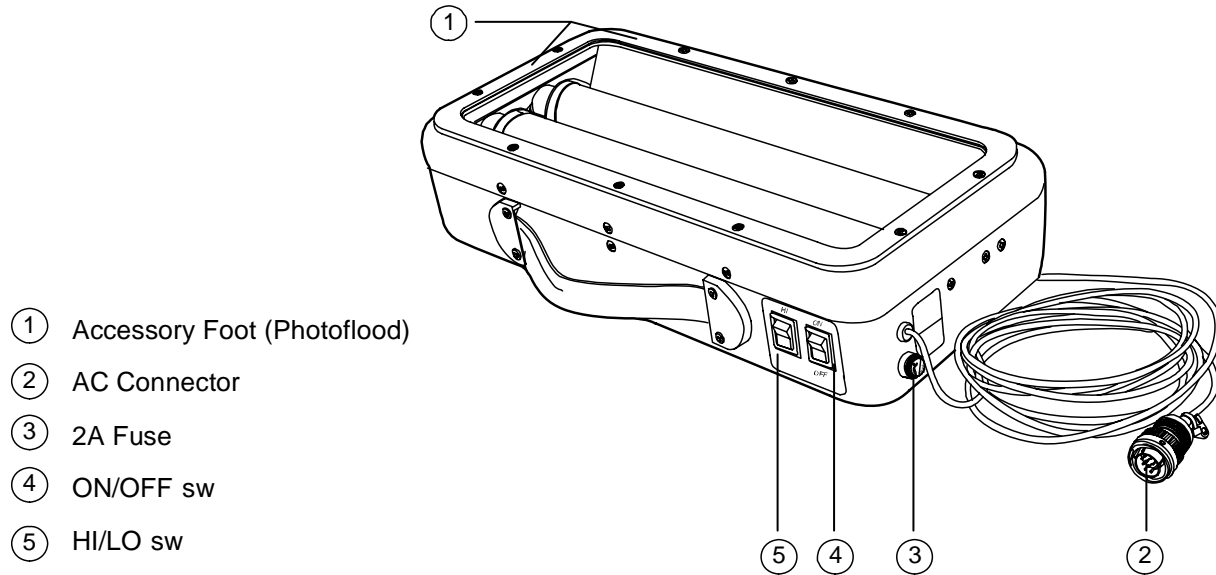
- HI – 12V output at J5
- LO – 8.4V output at J3

CCTV (Continued)
TVCU



jsc48037_045.cnv

CCTV (Continued)
PHOTO FLOODLIGHT



- ① Accessory Foot (Photoflood)
- ② AC Connector
- ③ 2A Fuse
- ④ ON/OFF sw
- ⑤ HI/LO sw

jsc48037_047.cnv

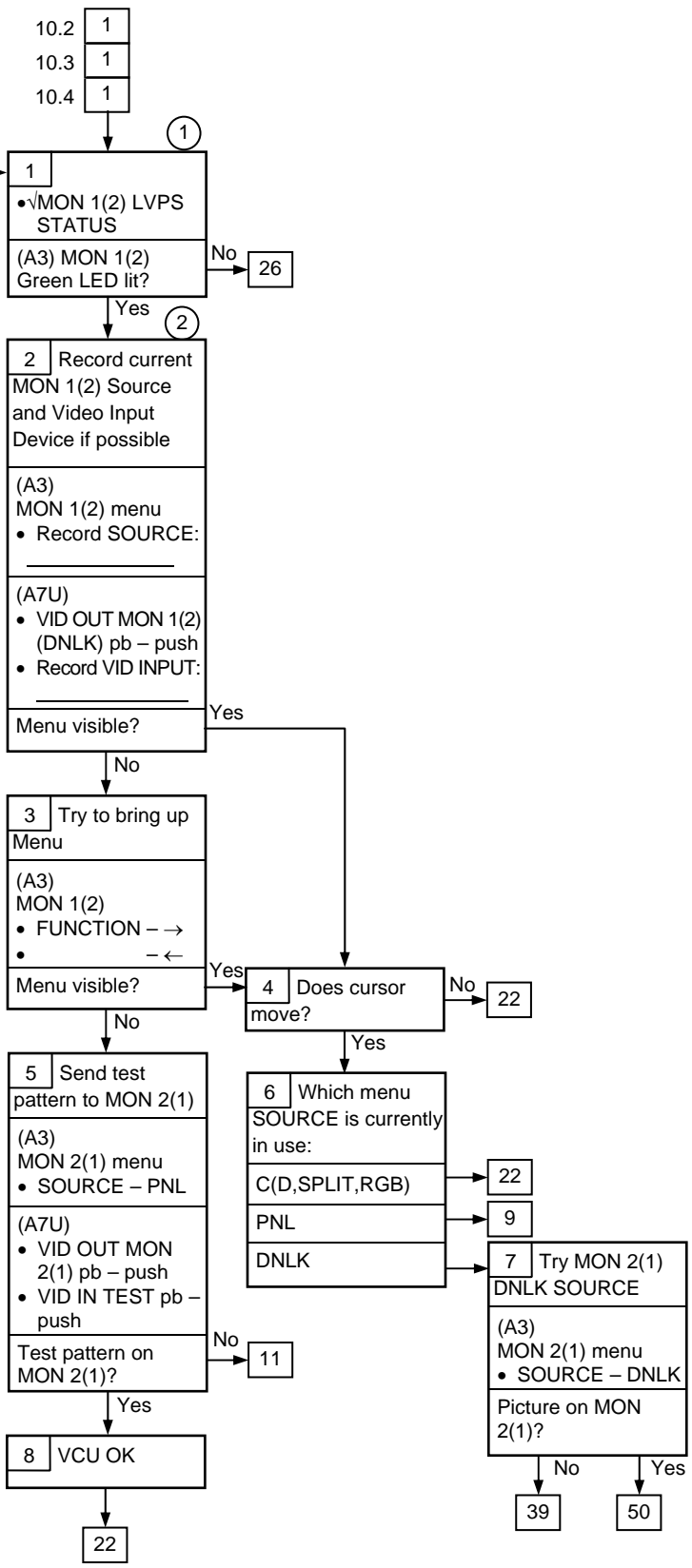
CCTV

10.1 NO MONITOR PICTURE/MENU

No Picture on Monitor 1(2)

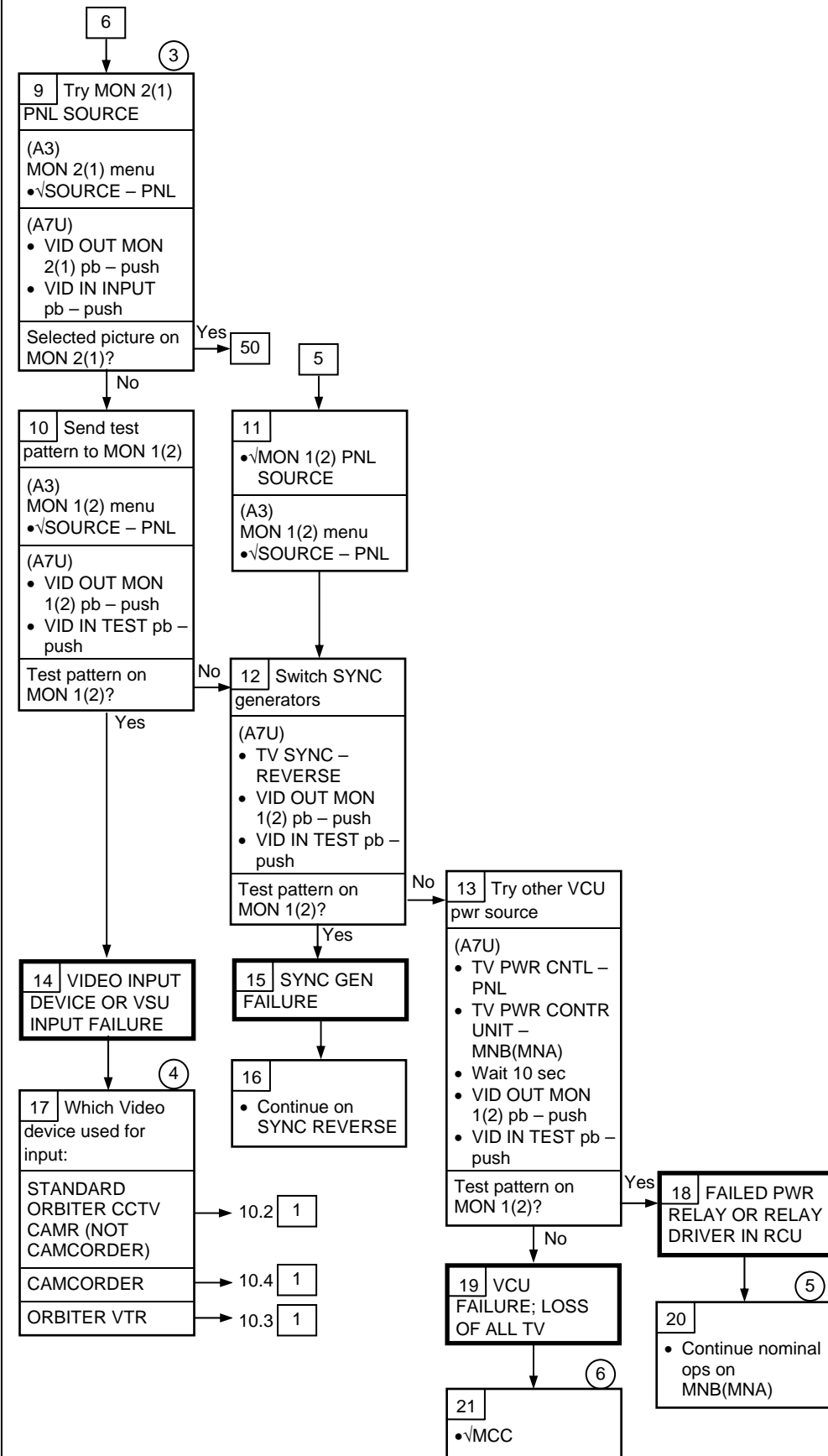
Nominal Config:

- (R14:D)
 cb MNA TV C AFT
 BAY CAMR/PAN-TILT - cl
 CAMR HTR - cl
 PAN-TILT HTR - cl
 cb MNA TV CONTR UNIT - cl
 cb MNA TV MON 1 - cl
 cb MNB TV A FWD BAY CAMR/PAN-TILT - cl
 CAMR HTR - cl
 PAN-TILT HTR - cl
 cb MNB TV CONTR UNIT - cl
 cb MNB TV MON 2 - cl
 cb MNC TV B KEEL/EVA CAMR/PAN-TILT - cl
 CAMR HTR - cl
 PAN-TILT HTR - cl
 cb MNC TV CAB - cl
 (R14:E)
 cb MNA D STBD RMS TV CAMR/PAN-TILT - cl
 CMR HTR - cl
 PAN-TILT HTR - cl
 cb MNB RMS PORT RMS TV CAMR/PAN-TILT - cl
 CAMR HTR - cl
 PAN-TILT HTR - cl
 (A7U)
 TV PWR CNTL - CMD
 TV PWR CONTR UNIT - MNA(MNB)
 TV SYNC - NORM
 TV DNLK - ENA
 (A3)
 MON 1(2)
 SOURCE - as reqd
 SYNC - INT
 PWR - ON
 MODE - AUTO
 GUNS - R,G,B - ON



- ① LVPS = low voltage pwr supply
- ② Current SOURCE and INPUT recorded here will be used in subsequent mal blocks

CCTV 10.1 (Cont)

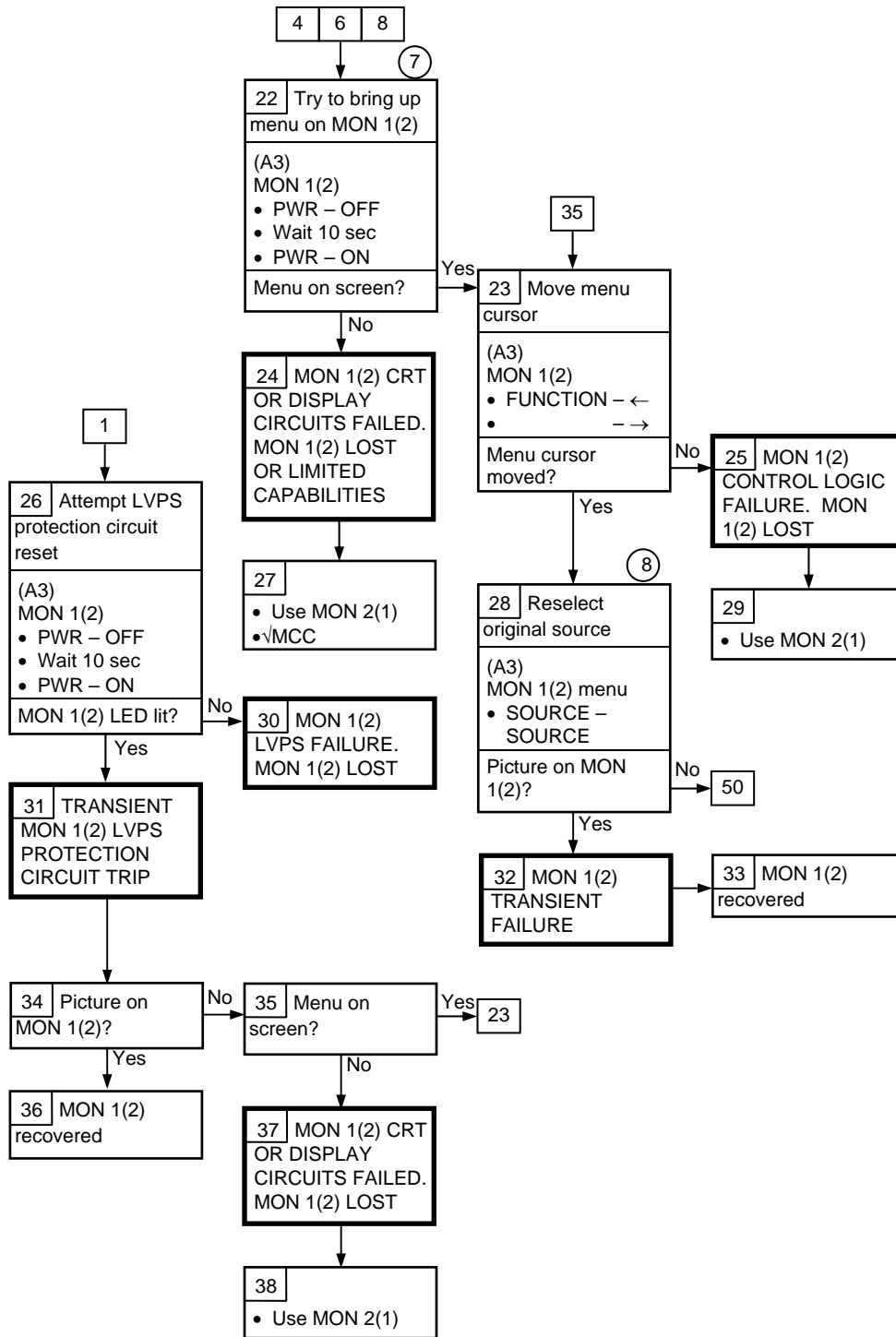


③ INPUT used here was recorded in block 2

④ Video Input Device is the device connected to INPUT which was recorded in block 2

⑤ All TV config in VCU will be lost. All camrs must be pwr'd up and reselected

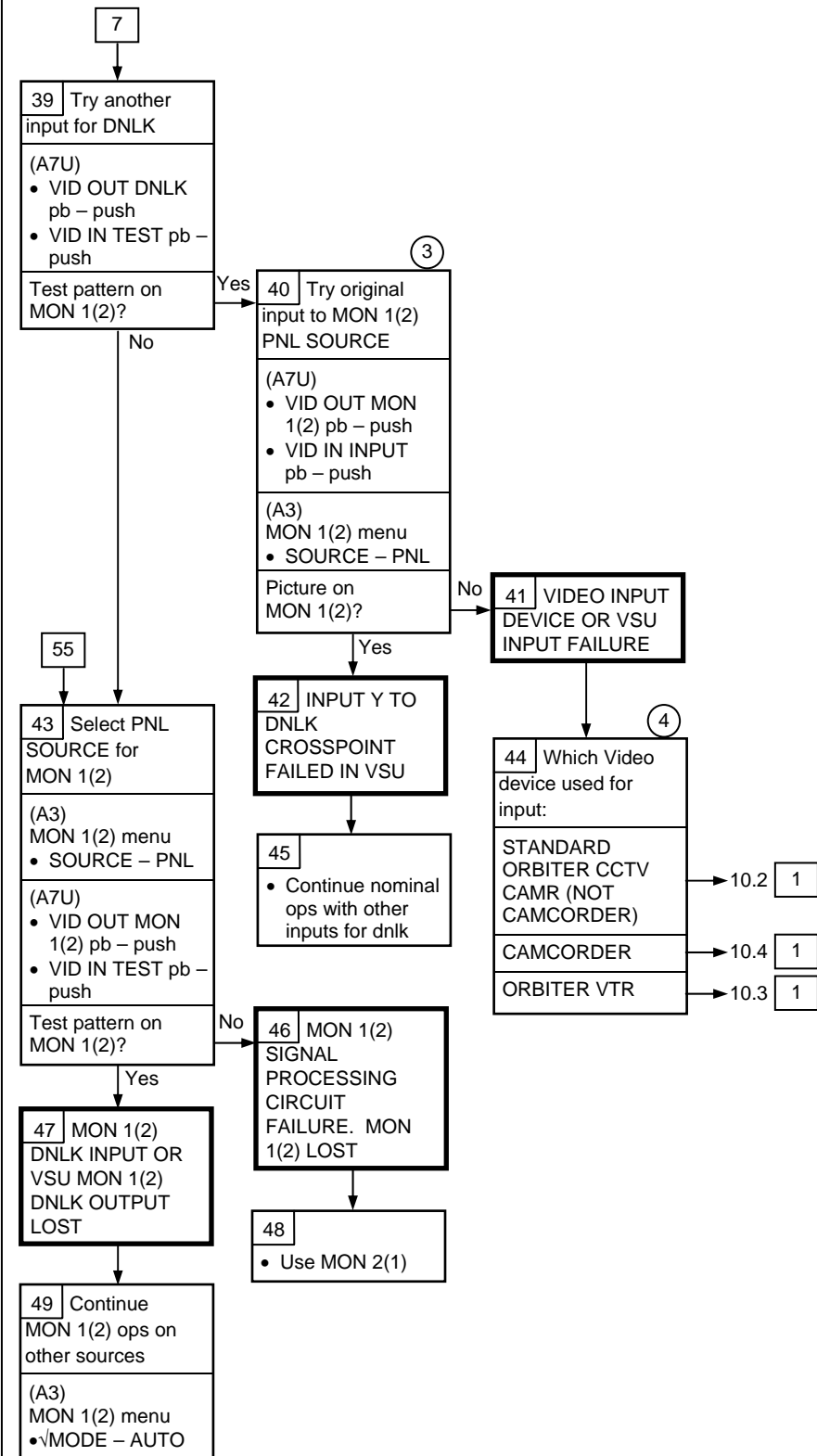
⑥ Standalone MON 1(2) ops may be possible on inputs C,D, or RGB if connected and also if input SOURCE generates its own sync



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

8
SOURCE is the source recorded in block 2

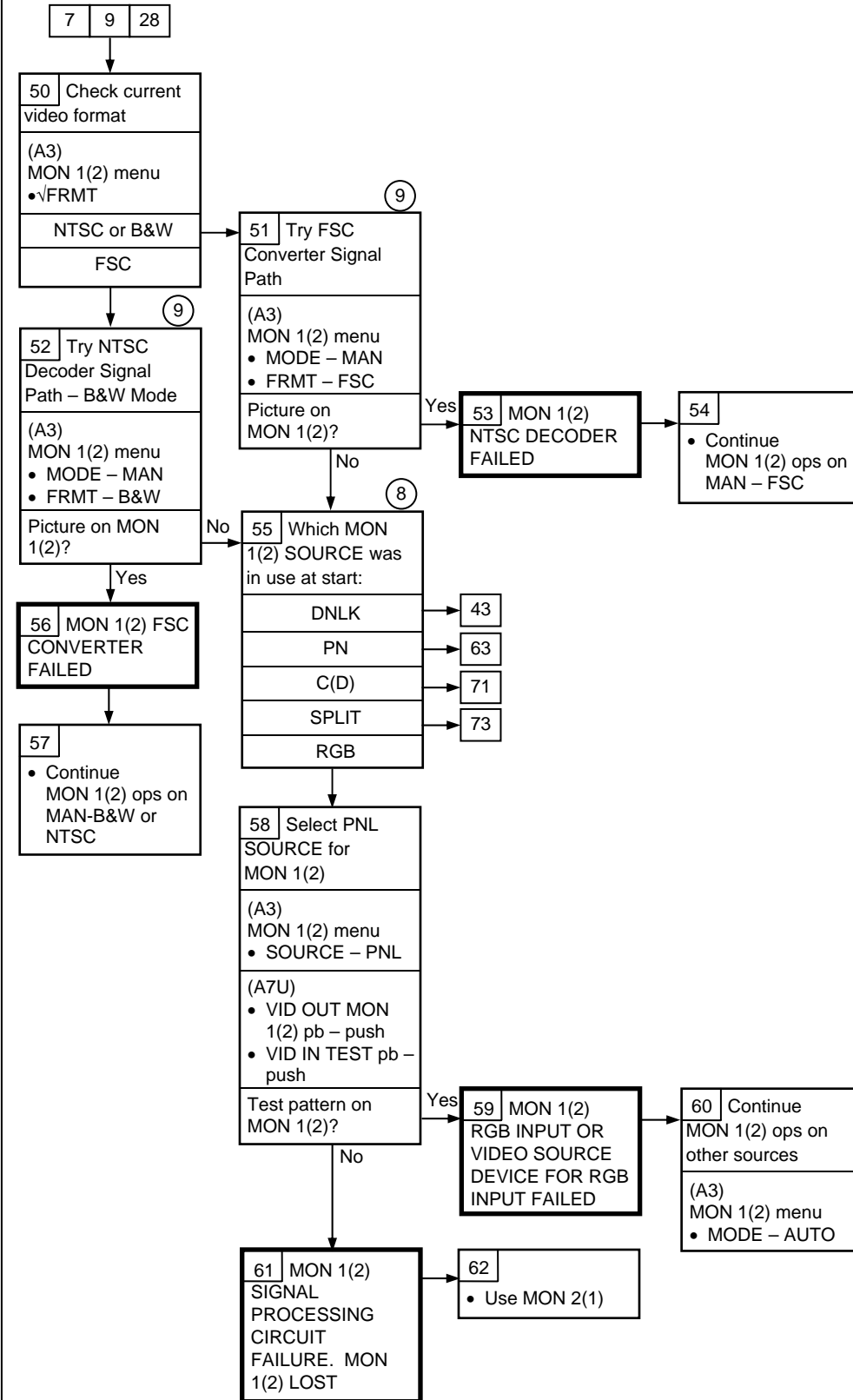
CCTV 10.1 (Cont)



③ INPUT used here was recorded in block 2

④ Video Input Device is the device connected to INPUT which was recorded in block 2

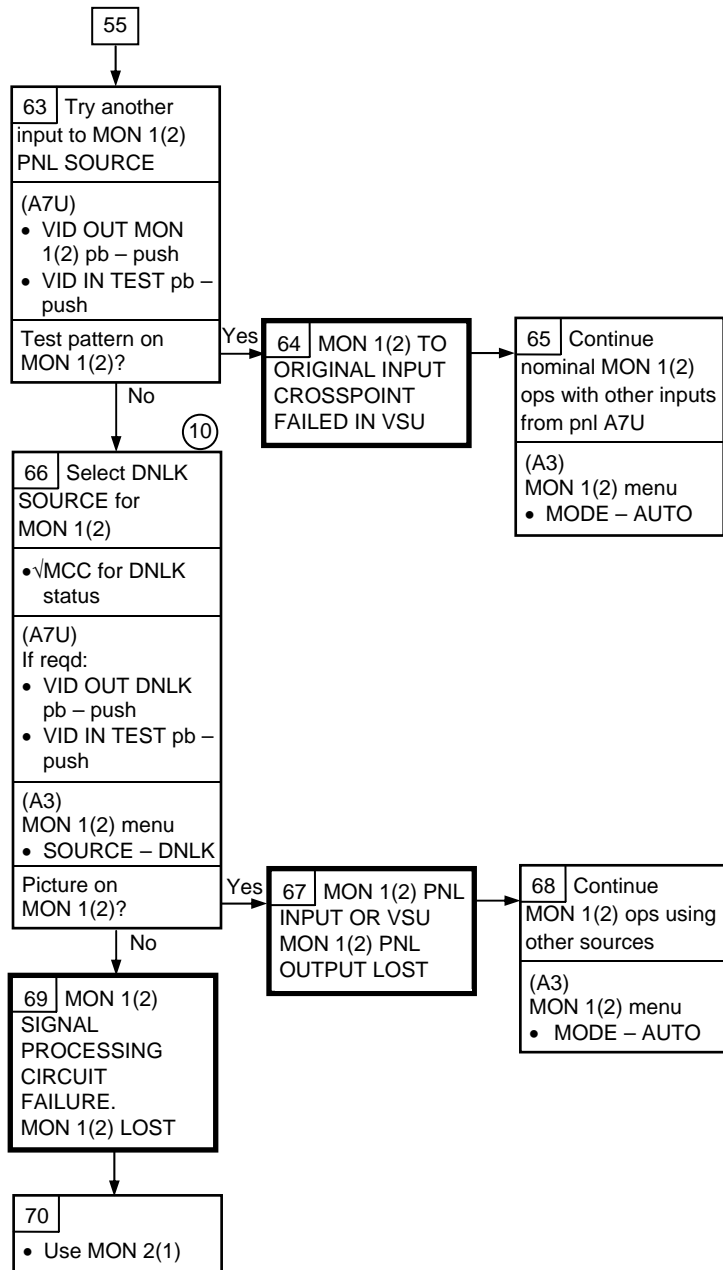
CCTV 10.1 (Cont)



8 SOURCE is the source recorded in block 2

9 Picture will be B&W with possible flicker

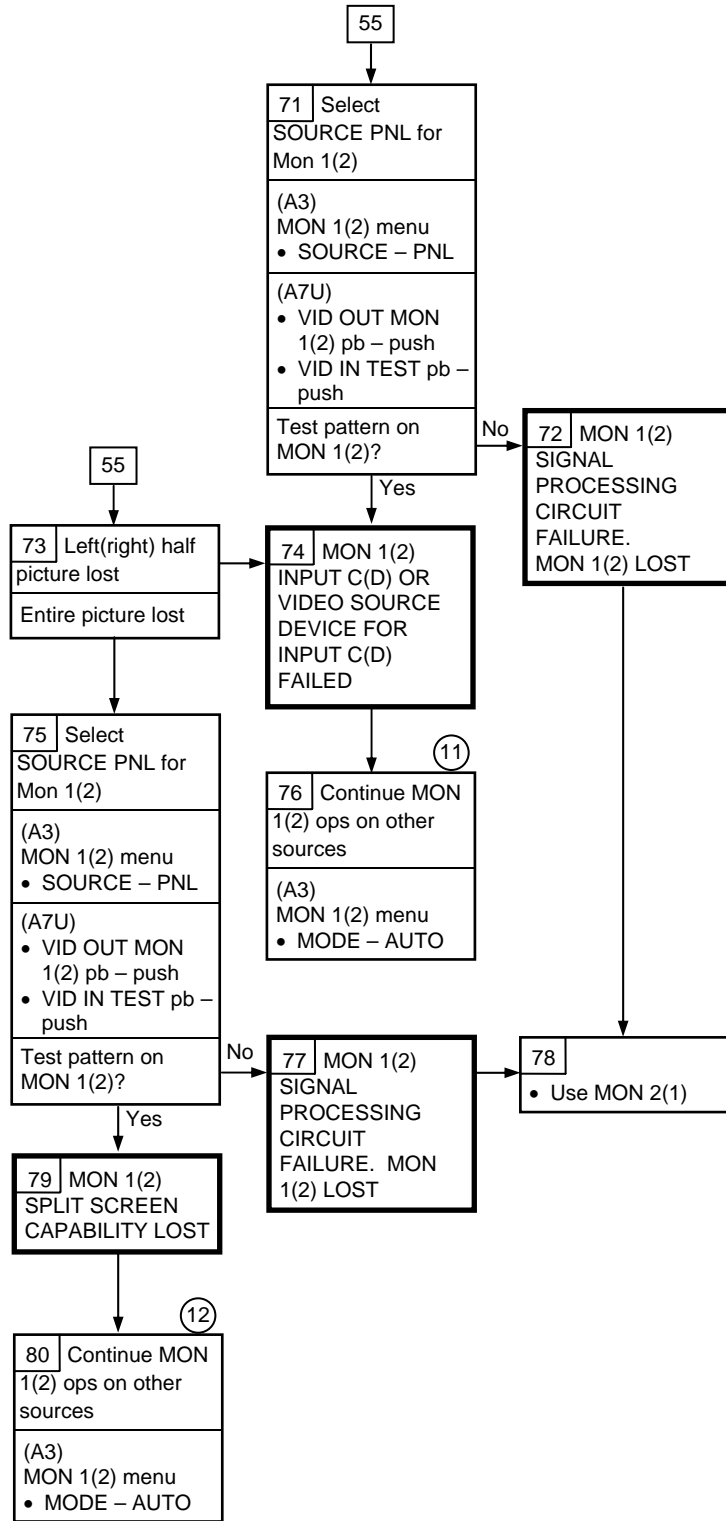
CCTV 10.1 (Cont)



⑩
If DNLK in progress, selecting test pattern to DNLK not reqd. MCC will advise on DNLK status

CCTV

10.1 (Cont)



(11)
Recovery of video source device may be possible

(12)
Inputs C,D may be useable without SPLIT

CCTV

10.2 NO CAMR VIDEO

No Camr Video

Nominal Config:

(R14:D)
 cb MNA TV C AFT
 BAY CAMR/PAN-
 TILT – cl
 CAMR HTR – cl
 PAN-TILT HTR –
 cl

cb MNA TV CONTR
 UNIT – cl

cb MNA TV MON 1 –
 cl

cb MNB TV A FWD
 BAY CAMR/PAN-
 TILT – cl
 CAMR HTR – cl
 PAN-TILT HTR –
 cl

cb MNB TV CONTR
 UNIT – cl

cb MNB TV MON 2 –
 cl

cb MNC TV B KEEL/
 EVA CAMR/PAN-
 TILT – cl
 CAMR HTR – cl
 PAN-TILT HTR –
 cl

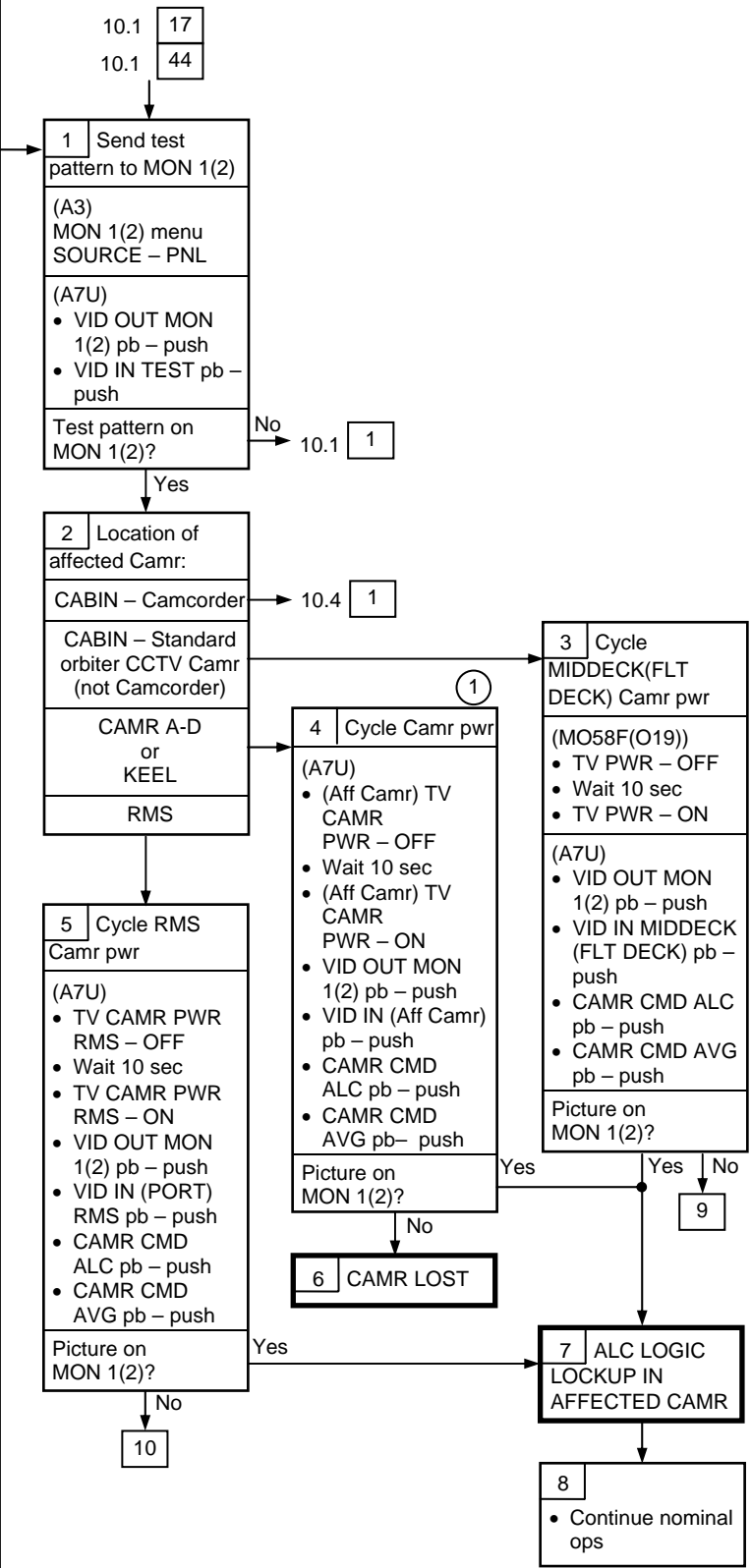
cb MNC TV CAB – cl

(R14:E)
 cb MNA D STBD
 RMS TV CAMR/
 PAN-TILT – cl
 CMR HTR – cl
 PAN-TILT HTR –
 cl

cb MNB RMS PORT
 RMS TV CAMR/
 PAN-TILT – cl
 CAMR HTR – cl
 PAN-TILT HTR –
 cl

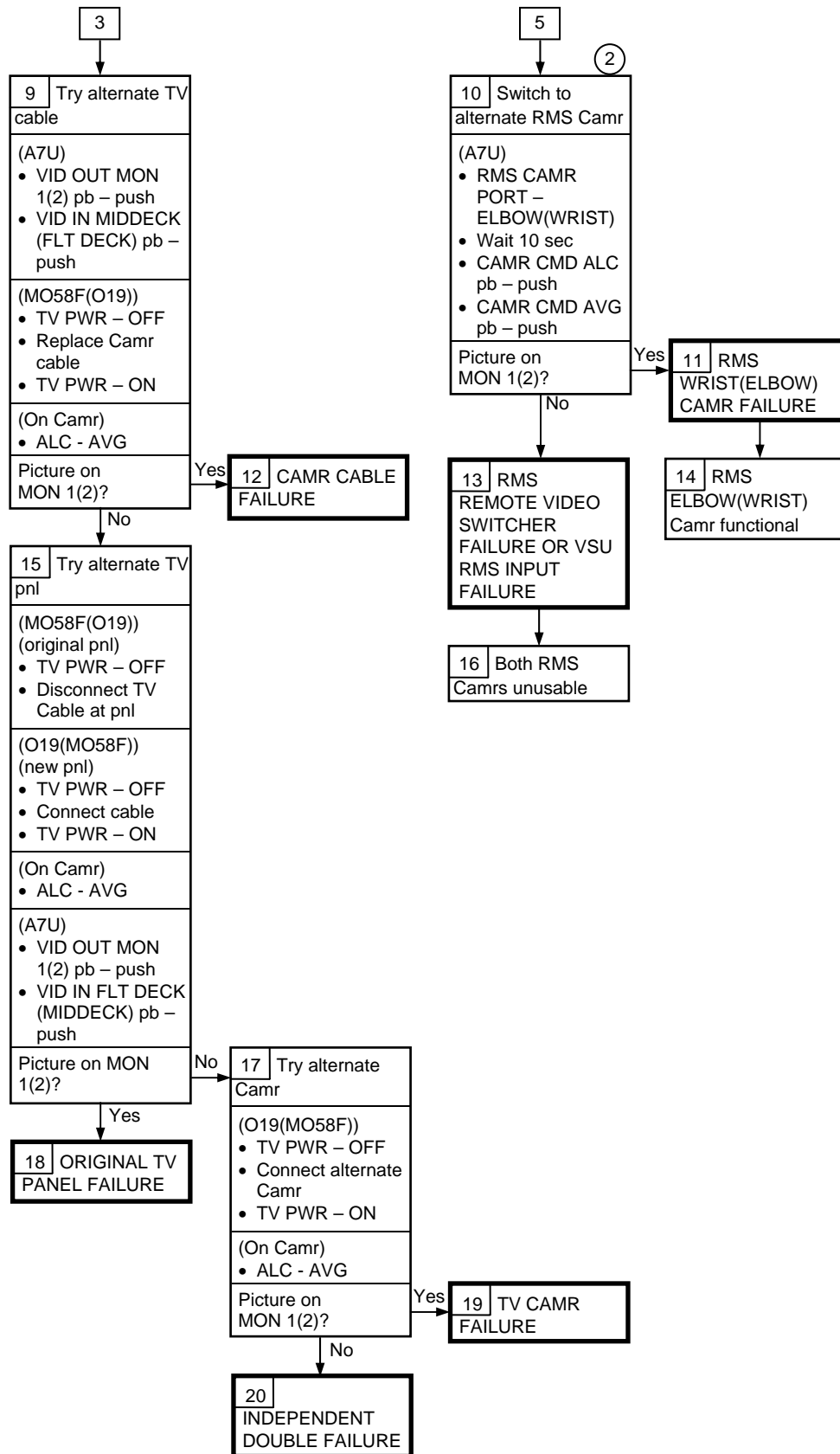
(A7U)
 TV PWR CNTL –
 CMD
 TV PWR CONTR
 UNIT –
 MNA(MNB)
 TV SYNC – NORM
 TV DNK – ENA

(A3)
 MON 1(2)
 SOURCE – as reqd
 SYNC – INT
 PWR – ON
 MODE – AUTO
 GUNS – R,G,B –
 ON



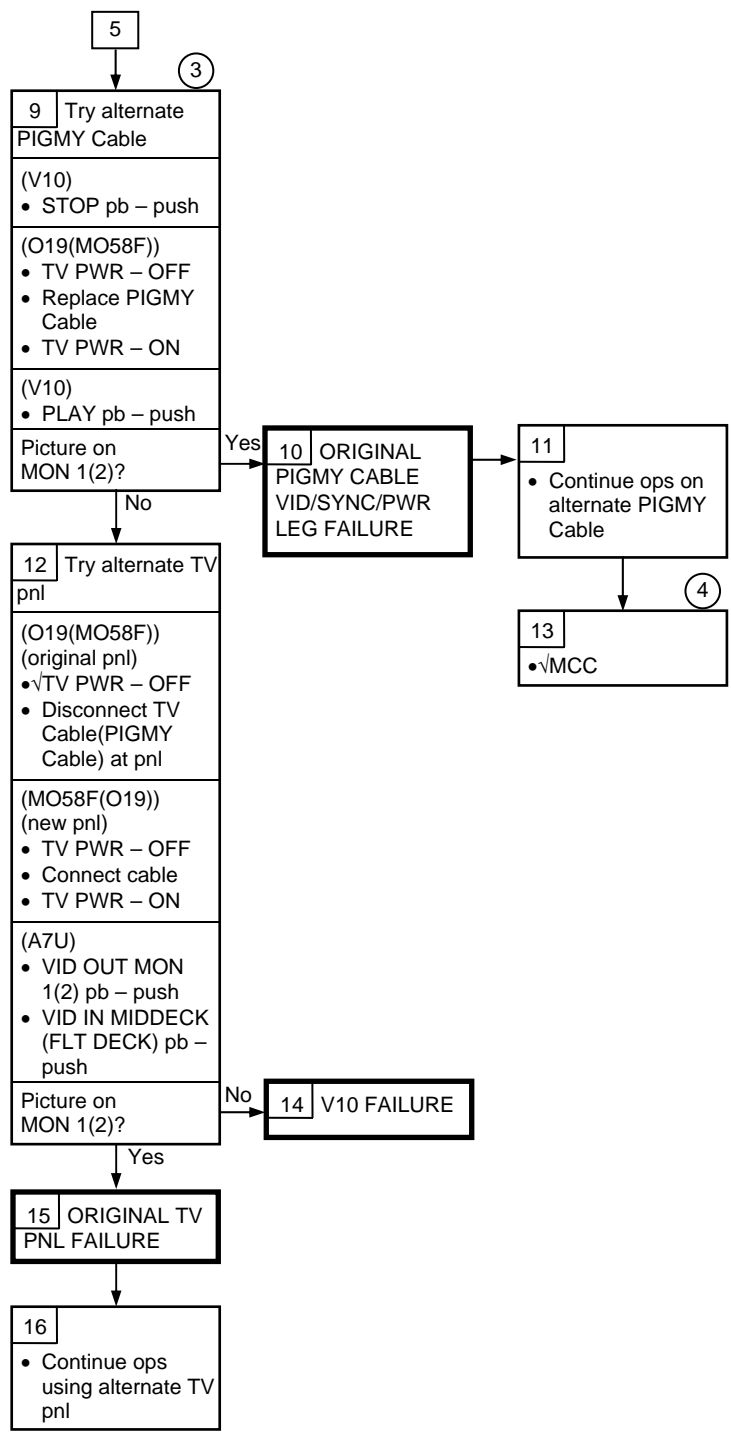
①
 KEEL Camr pwr control and KEEL Camr Video inputs are mission specific

CCTV 10.2 (Cont)



②
If currently selected to WRIST(ELBOW) then select ELBOW(WRIST)

CCTV 10.3 (Cont)



③
√MCC if alternate
equip avail

④
IFM for AVIU(cables)
may be possible

CCTV

10.4 NO CAMCORDER VIDEO ON COLOR TV MONITOR

10.1 17
 10.1 44
 10.2 2

No Camcorder Video

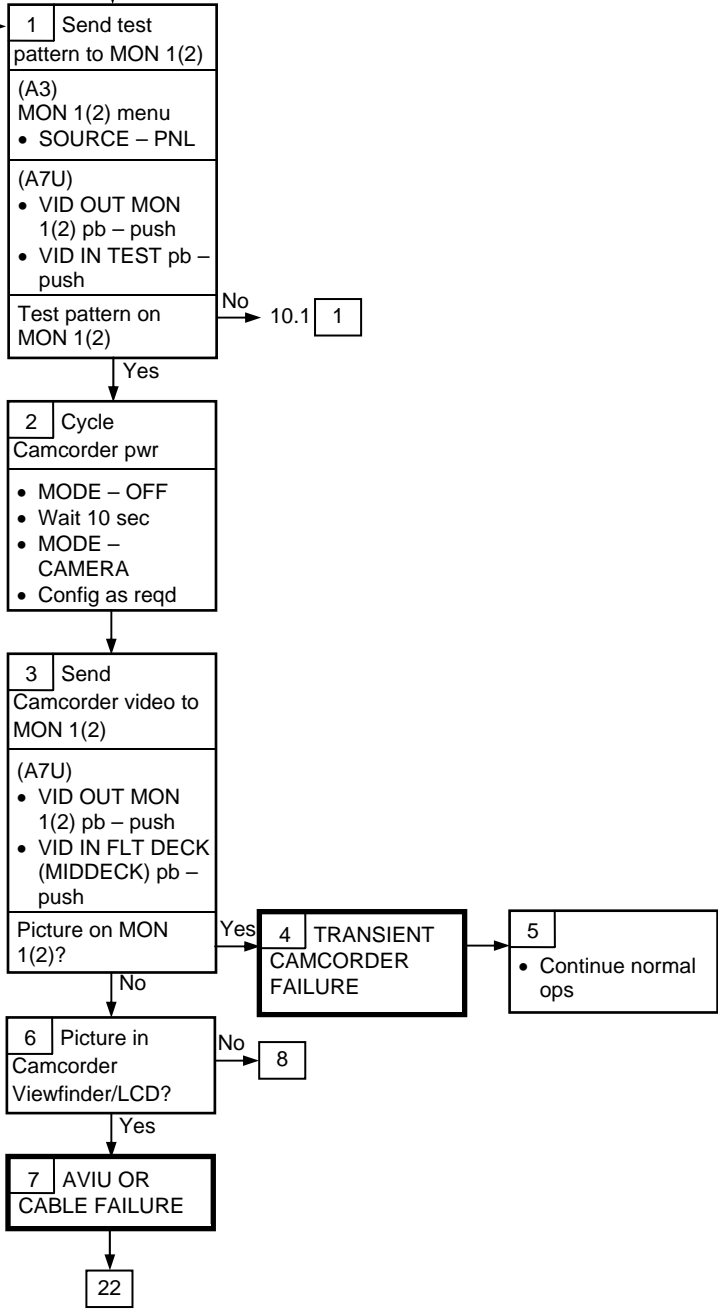
Nominal Config:

(R14:D)
 cb MNA TV CONTR UNIT - cl
 cb MNA TV MON 1 - cl
 cb MNB TV CONTR UNIT - cl
 cb MNB TV MON 2 - cl
 cb MNC TV CAB - cl

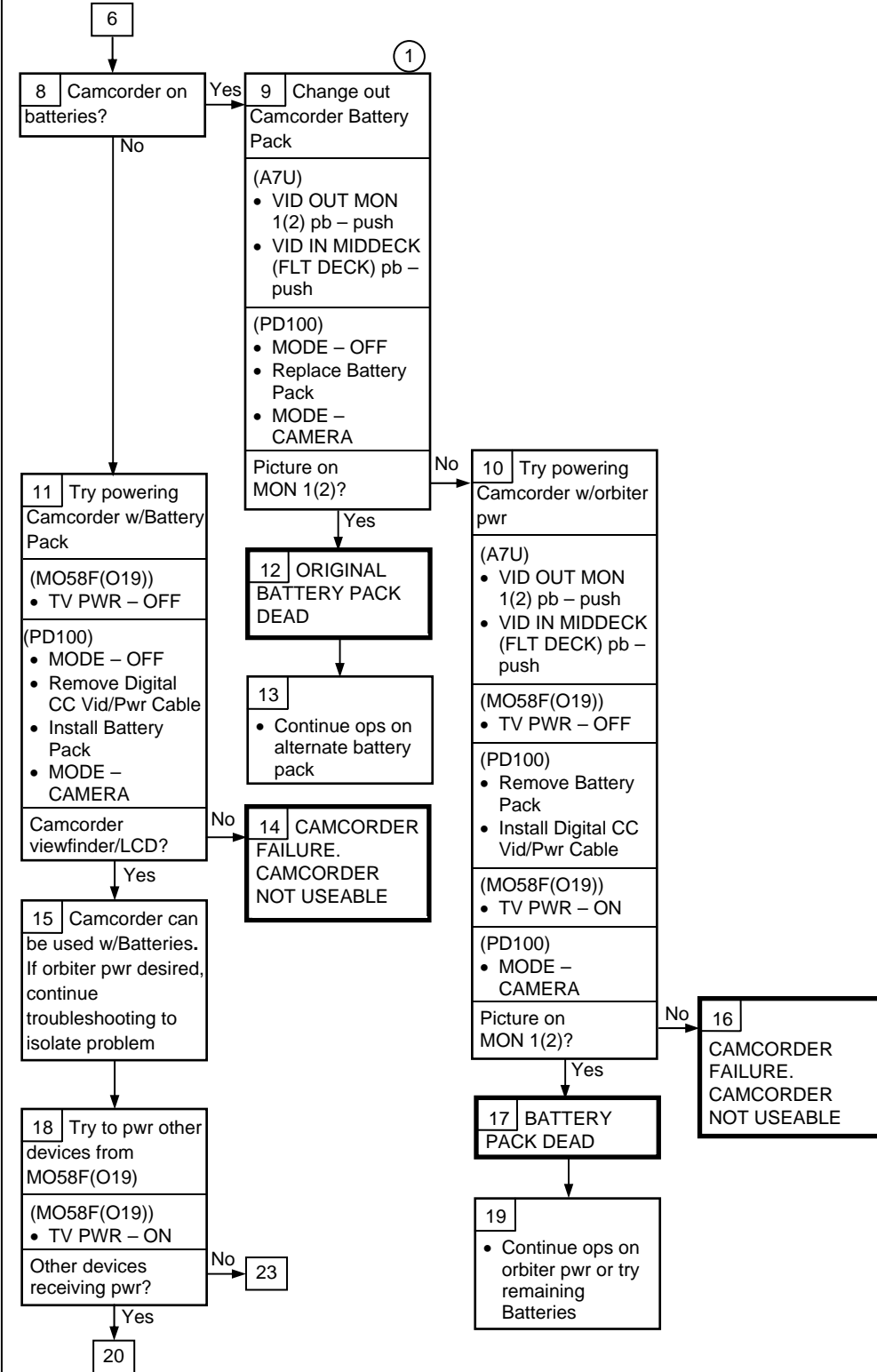
(A7U)
 TV PWR CNTL - CMD
 TV PWR CONTR UNIT - MNA(MNB)
 TV SYNC - NORM
 TV DNK - ENA

(A3)
 MON 1(2)
 SOURCE - as reqd
 SYNC - INT
 PWR - ON
 MODE - AUTO
 GUNS - R,G,B - ON

(PD100)
 MODE - CAMERA

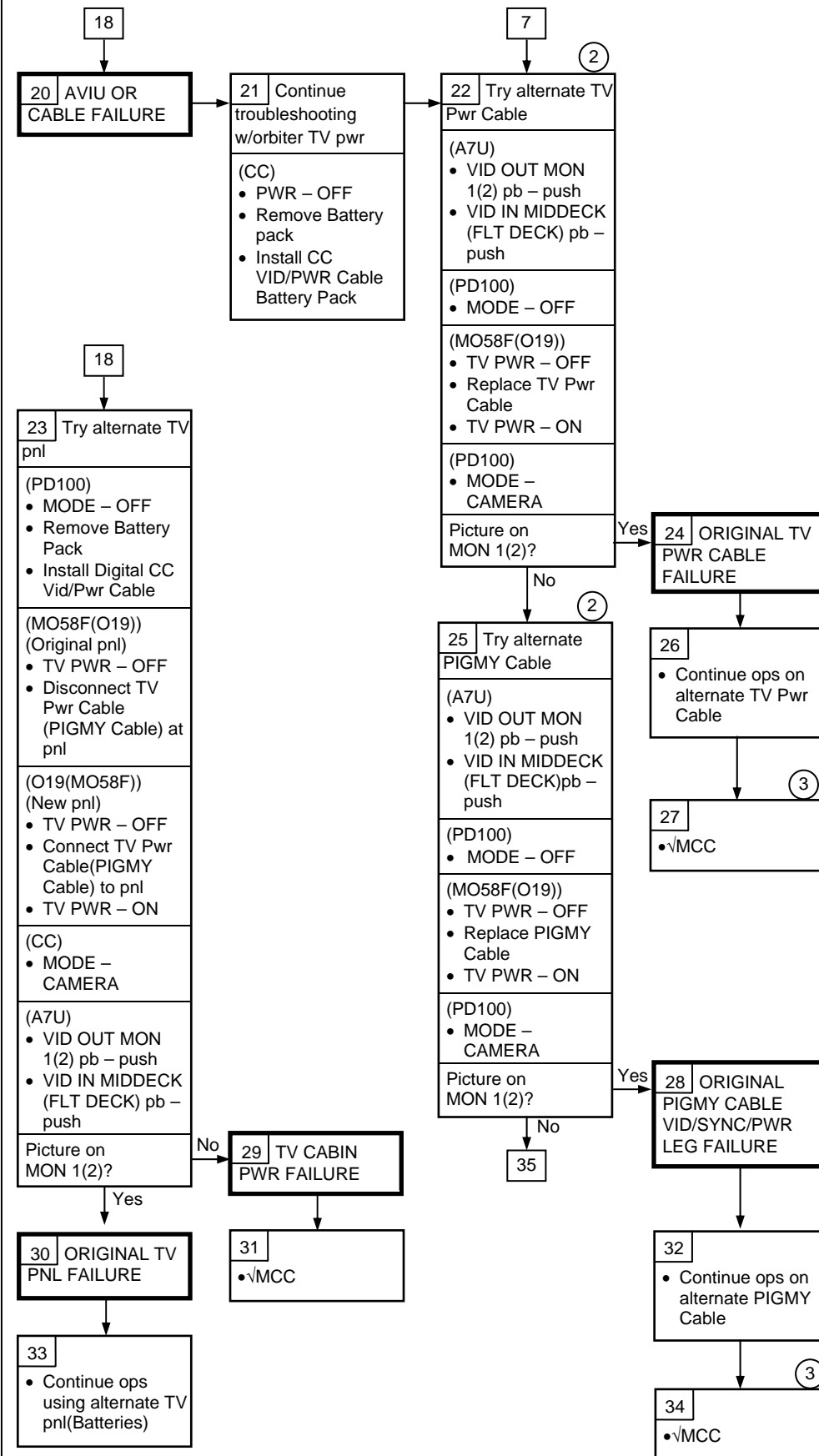


CCTV 10.4 (Cont)



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

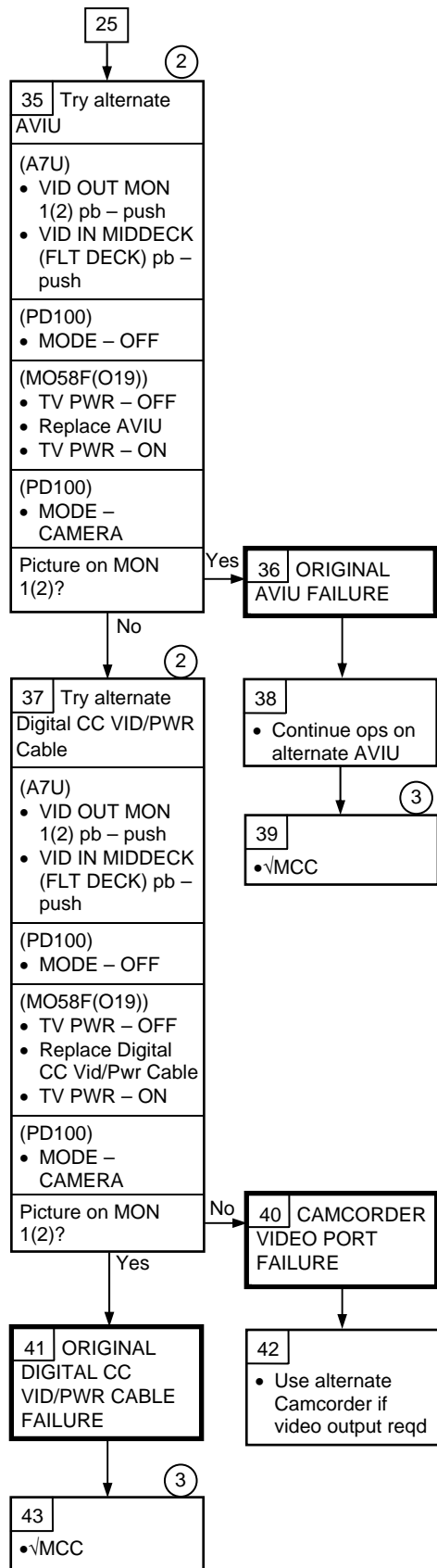
CCTV 10.4 (Cont)



②
√MCC if alternate equip not avail

③
IFM for AVIU or cables may be possible

CCTV 10.4 (Cont)



②
√MCC if alternate
equip not avail

③
IFM for AVIU or
cables may be
possible

CCTV

10.5 RMS TV cb OPENS

Port RMS TV Camr/Pan-Tilt cb Opens

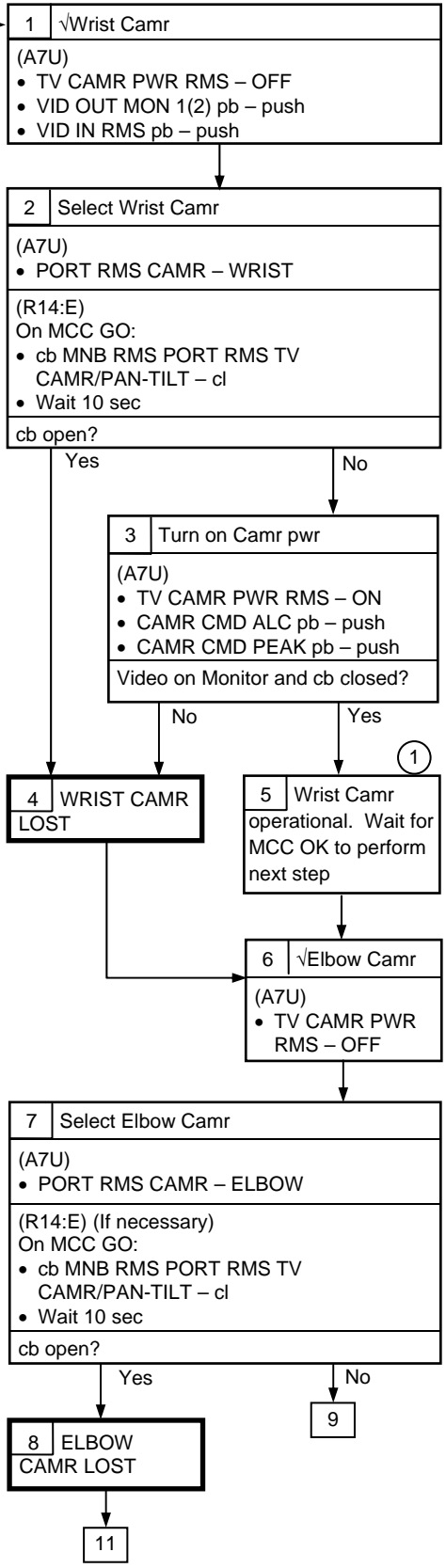
Nominal Config:

(R14:D)
 cb MNA TV CONTR UNIT – cl
 cb MNA TV MON 1 – cl
 cb MNB TV CONTR UNIT – cl
 cb MNB TV MON 2 – cl
 cb MNC TV CAB – cl

(R14:E)
 cb MNB RMS PORT RMS TV CAMR/PAN-TILT – cl
 CAMR HTR – cl
 PAN-TILT HTR – cl

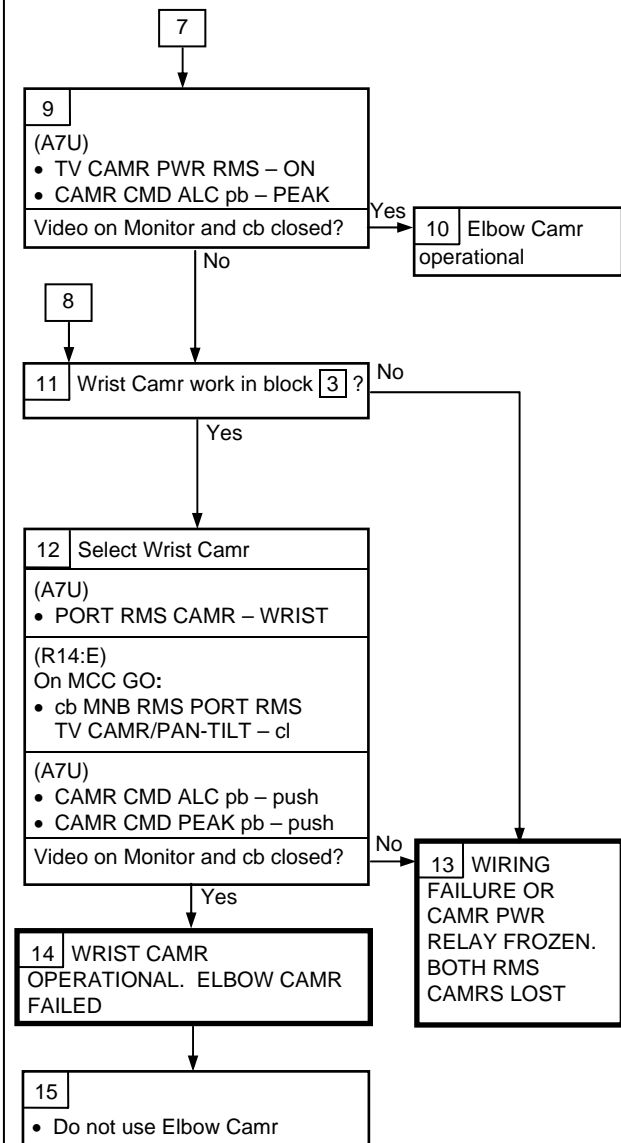
(A7U)
 TV PWR CNTL – CMD
 TV PWR CONTR UNIT – MNA(MNB)
 TV SYNC – NORM
 TV DNLK – ENA

(A3)
 MON 1(2) SOURCE – as reqd
 SYNC – INT
 PWR – ON



① Pwr routed to both Camrs at all times and switched inside Camrs. Short occurring in one Camr may cause loss of pwr to both Camrs on RMS. Decision to proceed based on current spikes, if any, and importance of RMS Camrs to remainder of mission

CCTV 10.5 (Cont)



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CENTERLINE (C/L) CAMR

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C/L CAMR

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)

Unstow PRI C/L Camr, PRI C/L TV Camr Harness Assy per stowage plan

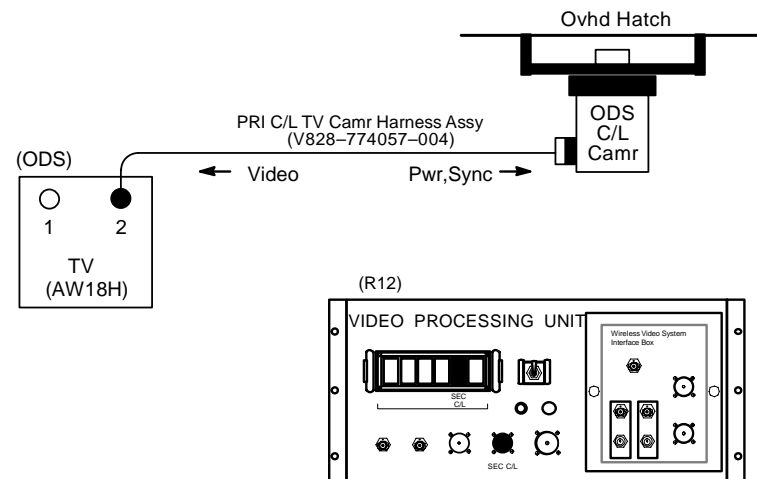
NOTE

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

ODS ✓ODS C/L Camr Brkt mounted securely
 Mount PRI 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) ✓cb SW PWR 1 (CB2) – cl
 (SSP 2) C/L CAM PWR – SEC ON

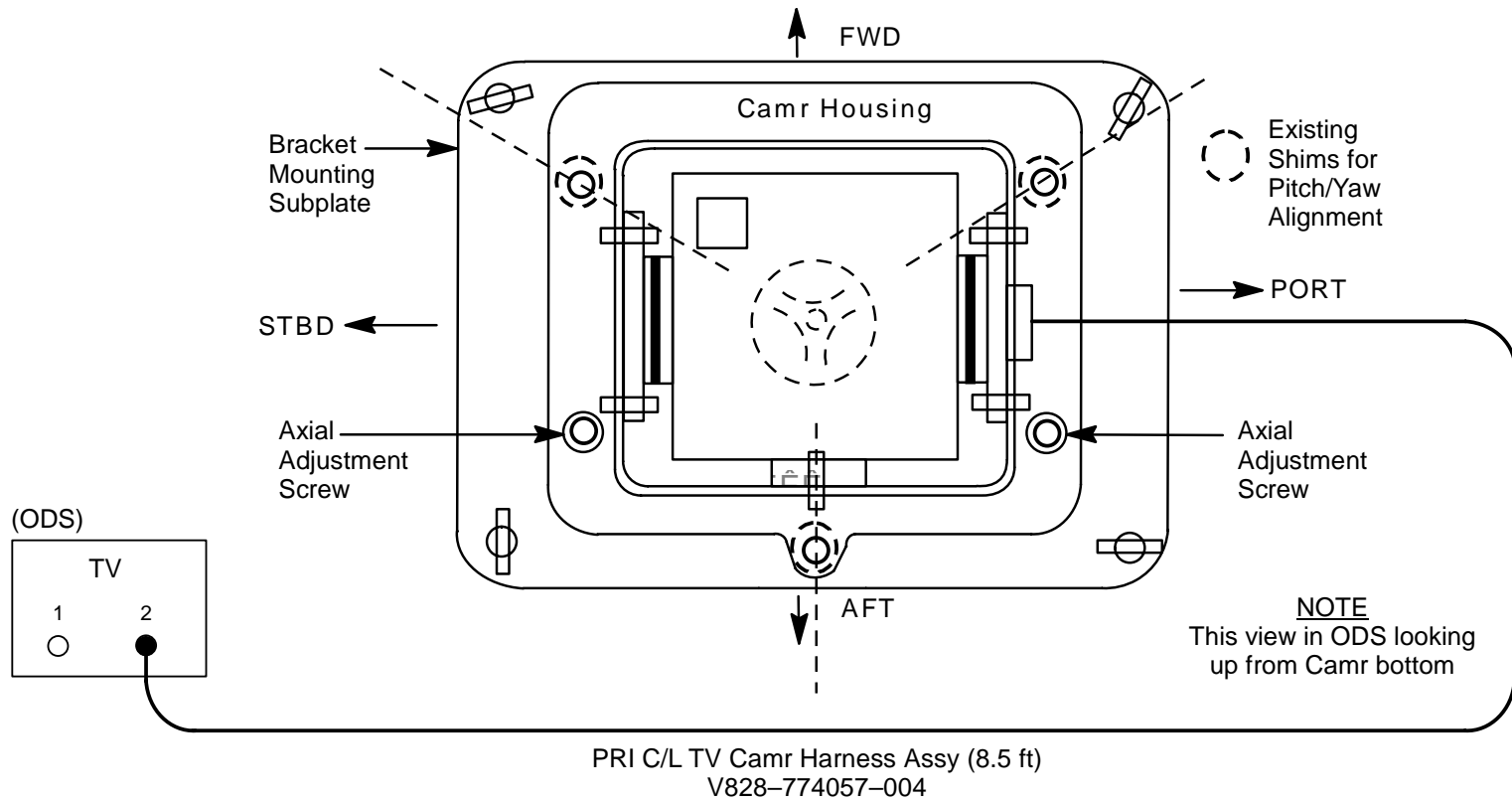


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CENTERLINE (C/L) CAMR (Continued)

C/L CAMR INSTALL (Continued)

2. Camr Position Verification



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CENTERLINE (C/L) CAMR (Continued)

I

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

NOTE

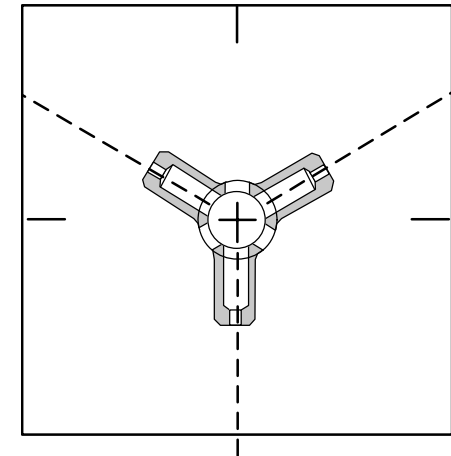
Green xhairs on monitor may move off center in calibration target when zooming in,out. Xhair will be closest to center at full zoom in position

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 ~10-40° zoom range of Camr

Report results of both alignment verifications (at 10° and 40°) 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



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CENTERLINE (C/L) CAMR (Continued)

C/L CAMR VIDEO TROUBLESHOOT

1. ✓C/L Camr nominal config:
- ODS Camr SSF/STS sw – STS
 - PRI 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 (It ON)
 - L12 (SSP 1) ✓cb SW PWR 1 (CB2) – cl
 - (SSP 2) 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 PRI 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 |
| L12 (SSP 2) | Unstow SEC C/L TV Camr Harness Assy per stowage plan
Disconnect PRI C/L TV Camr Harness Assy from ODS TV1 port and PRI C/L Camr
Connect SEC C/L TV Camr Harness Assy to ODS TV1 and PRI C/L Camr
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 SEC C/L Camr:

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

Unstow SEC C/L TV Camr per stowage plan
Disconnect SEC C/L TV Camr Harness Assy from PRI C/L Camr
Remove PRI C/L Camr from ODS C/L Camr Brkt
Mount SEC C/L Camr to ODS C/L Camr Brkt
Connect SEC C/L TV Camr Harness Assy to SEC 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 xhair 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 xhair within target circle

5. Install SEC C/L Camr using PRI C/L Camr Harness Assy and ODS TV Port 2 (no change to VPU selections) per stowage plan:

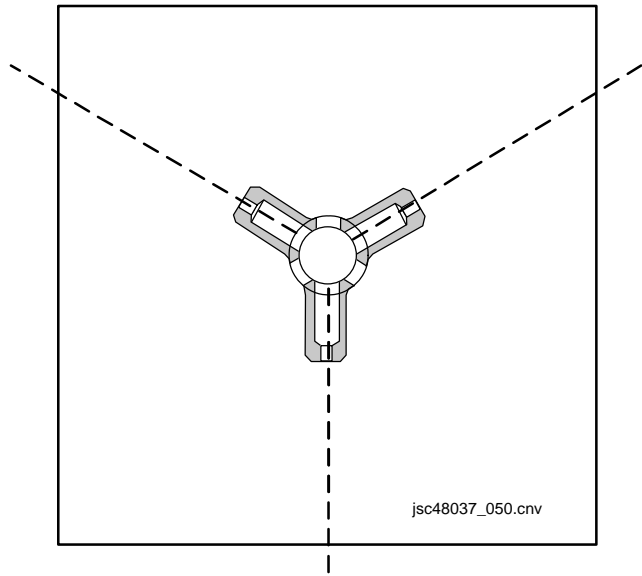
A7	CAMR CMD IRIS – CL (hold 8 sec)
L12 (SSP 2)	C/L CAM PWR – OFF
ODS	Disconnect Camr Harness Assy from PRI C/L Camr
	Replace PRI C/L Camr w/SEC C/L Camr
	Connect Camr Harness Assy to SEC C/L Camr
L12 (SSP 2)	C/L CAMR PWR – SEC ON
A7	ALC pb – push
	AVG pb – push

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

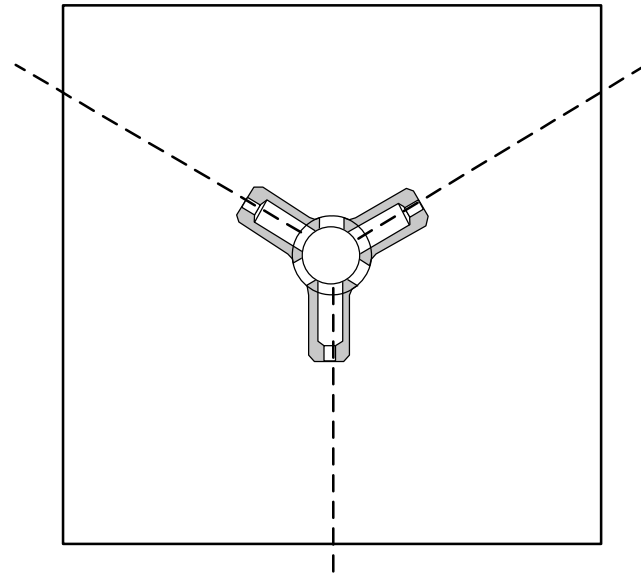
6. Repeat step 4 for SEC C/L Camr
7. If shimming both PRI and SEC C/L Camrs fails to bring xhair within target circle, re-install Camr w/best alignment. Report which Camr installed
8. √MCC to determine if ODS CENTERLINE CAMR ANGULAR ALIGNMENT (IFM, PROCEDURES M THRU R) reqd

CENTERLINE (C/L) CAMR (Continued)

C/L CAMR MISALIGNMENT (Concluded)



PRI C/L CAMR



SEC C/L CAMR

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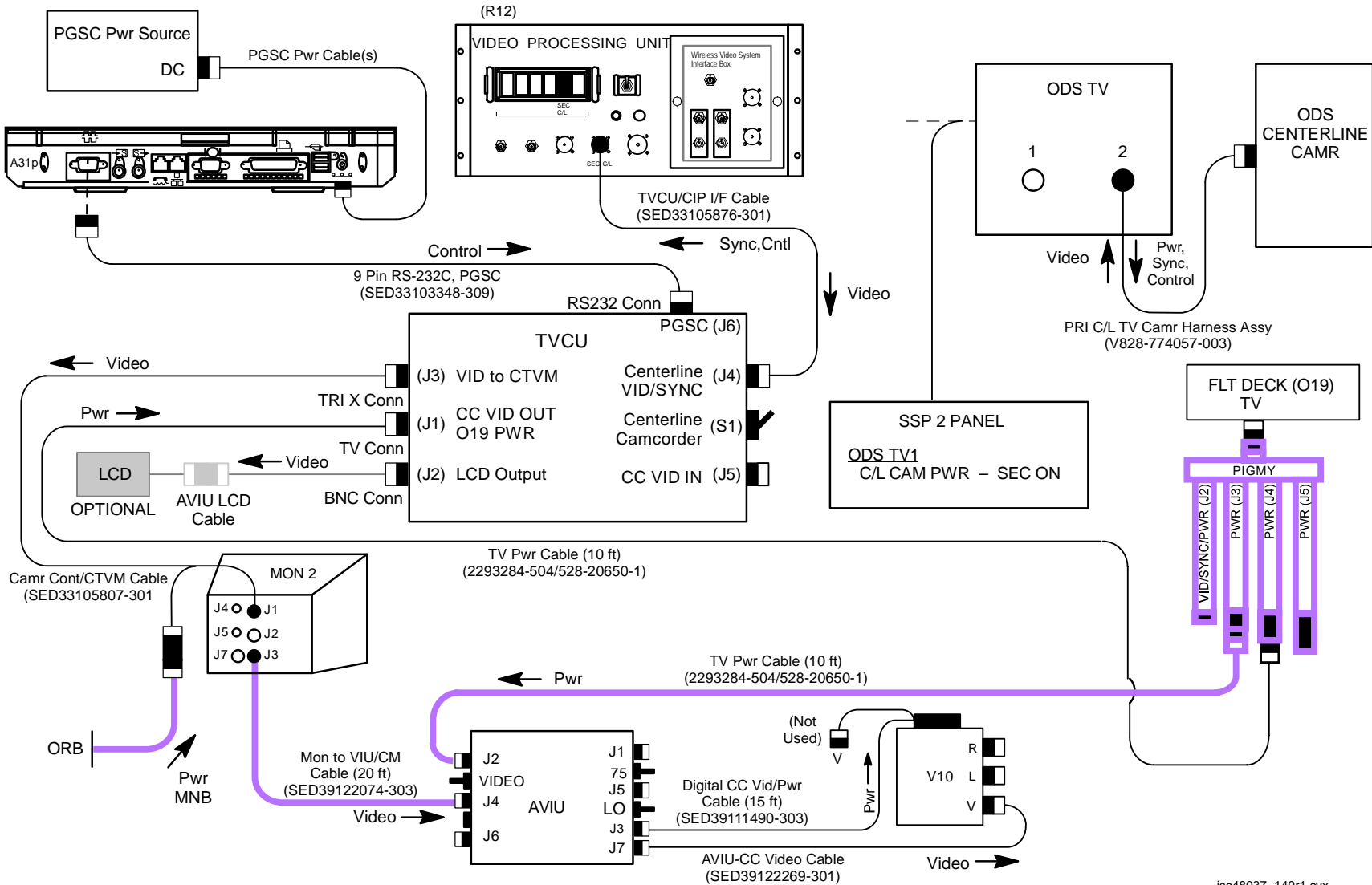
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR OPS FOR VSU FAIL

	1. <u>Setup</u>							
	Obtain:		TVCU		2. <u>Activation</u>			
	TVCU/CIP I/F Cable		O19		CENTERLINE/CAMCORDER sw – CENTERLINE			
	TVCU		L12		TV Pwr – ON			
	Camr Cont/CTVM Cable		(SSP 2)		C/L CAM PWR – SEC ON			
	TV Pwr Cable (20 ft) (2)							
	AVIU LCD Cable				PGSC PWR SOURCE – ON			
	LCD		A31p		PGSC – ON			
	RS-232 Cable							
	PGSC		R14:D		cb MNB TV MON 2 – cl			
	PGSC Pwr Cable(s)		A3		MON 2 PWR – ON			
	PIGMY							
	AVIU		V10		PWR – ON (LED on)			
	V10				√Tape – Installed			
	MON to VIU/CM Cable							
	Digital CC VID/PWR Cable		LCD		PWR – ON			
	AVIU-CC VID Cable							
			A31p		RUN TV CONTROLLER program			
A3	√MON 2 PWR – OFF				SHUTTLE Aps (double-click)			
R14:D	cb MNB TV MON 2 – op				TV Controller (double-click)			
A3	Disconnect Pwr MNB from MON 2 J1				Sel 'YES' in dialog box			
					CTVC CONTROLLER menu			
	Config per dwg, 11-11				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)

A31p 3. Deactivation
 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

I

DTV

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DTV

DTV

SPECIFICATIONS

VIP

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

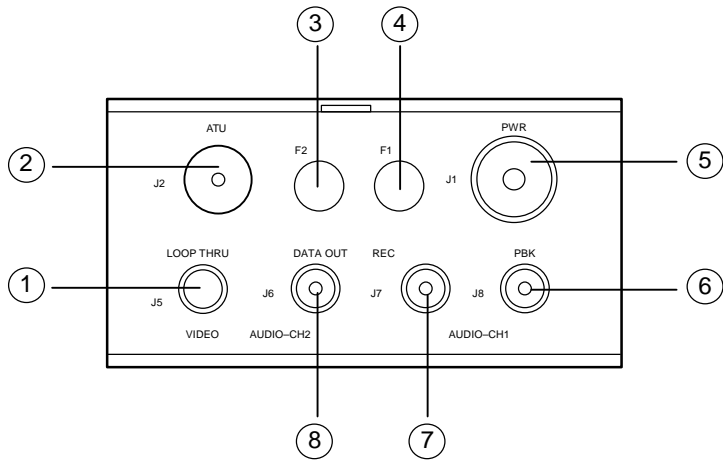
MUX

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)

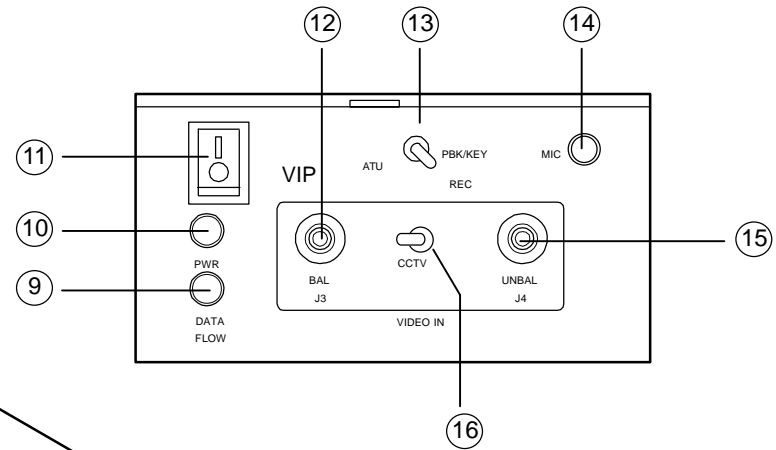
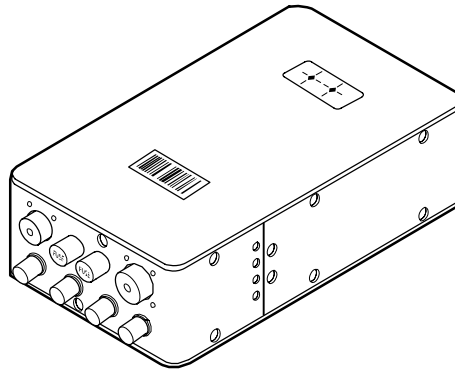
NOMENCLATURE

VIP



BACK

- ① Video Loop Thru Connector (J5)
- ② ATU Audio Connector (J2)
- ③ F2: 2-Amp Fuse
- ④ F1: 5-Amp Fuse
- ⑤ AC Pwr Connector (J1)
- ⑥ Playback Audio Connector (J8)
- ⑦ Record Audio Connector (J7)
- ⑧ Interval DATA OUT Connector (J6)



FRONT

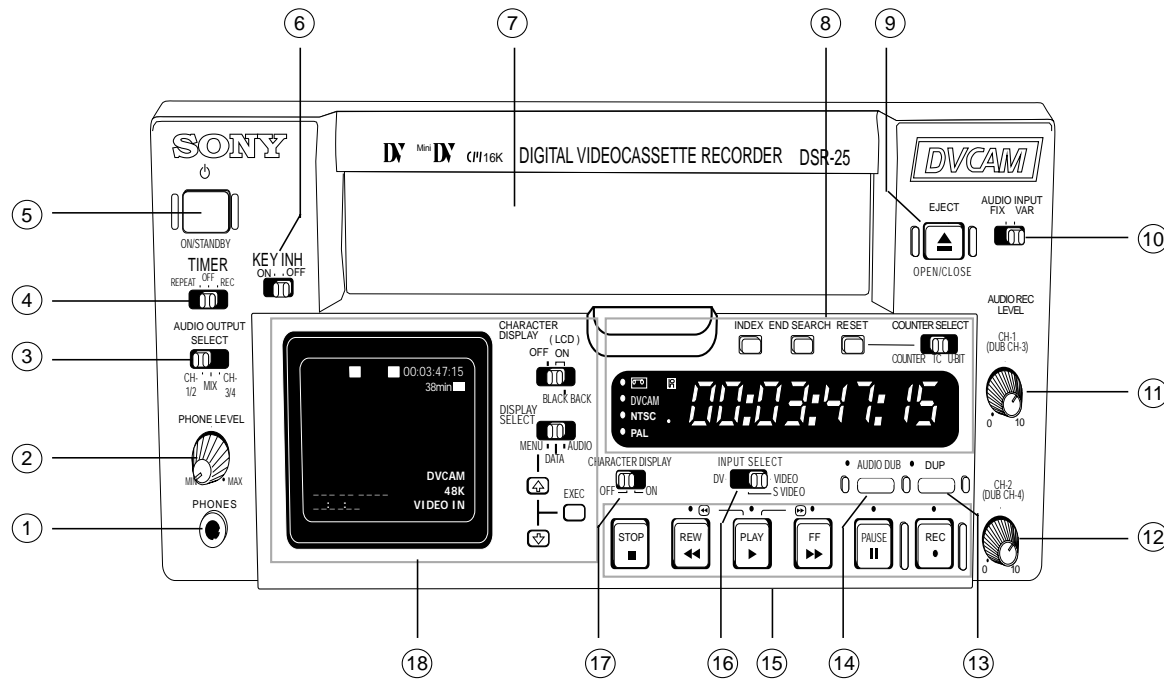
- ⑨ Data Flow LED (green)
- ⑩ PWR LED (green)
- ⑪ PWR sw
- ⑫ Balanced Video Connector (J3)
- ⑬ ATU sw
- ⑭ PLAYBACK/KEY MIC LED
- ⑮ Unbalanced Video Connector (J4)
- ⑯ CCTV VIDEO IN sw

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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 (CH 1/2)
- 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 (OFF)
- ⑱ Monitor Display and Controls

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DTV (Continued)

NOMENCLATURE (Continued)

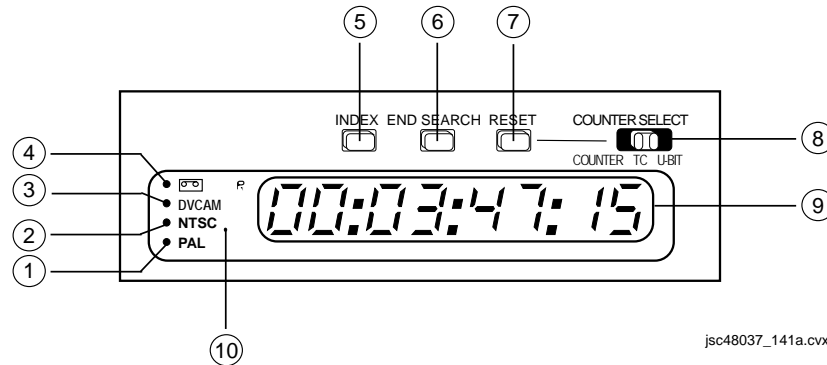
VTR (SONY DSR-25) – FRONT PANEL (Concluded)

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 (Default = CH 1/2)	Determines which audio channels are output in 32 kHz mode only
④	TIMER sw (Default = 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 (Default = OFF)	Disables all pbs when ON
⑦	Cassette Compartment	Tape insertion location, door opened/closed via EJECT pb
⑧	Display windows and controls	See 12-6 for details
⑨	EJECT pb	Opens/closes cassette compartment door and ejects tape, if installed
⑩	AUDIO INPUT sw (Default = 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
⑫	CH-2 AUDIO REC LEVEL kb (N/A)	Controls audio level for VI data
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 12-7 for details
⑯	INPUT SELECT sw (Default = VIDEO)	Determines which video input jack the VTR will process
⑰	CHARACTER DISPLAY sw (Default = OFF)	Determines if VTR monitor text is displayed in VTR OUT video
⑱	Monitor Display and Controls	See 12-8 for details

DTV (Continued)

NOMENCLATURE (Continued)

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

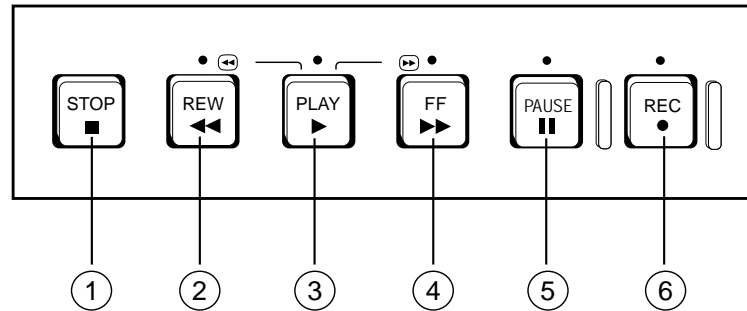


①	PAL Indicator/Amber (not used)	Lit when NTSC/PAL sw is in PAL posn or PAL formatted video being processed by the VTR
②	NTSC Indicator/Amber (on)	Lit when NTSC/PAL sw is in NTSC posn or NTSC formatted video being processed by the VTR
③	DVCAM Indicator/Amber (on)	Lit when the VTR is playing a DVCAM-formatted 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 (DD:HH:MM:SS)
	TC	Time code
	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



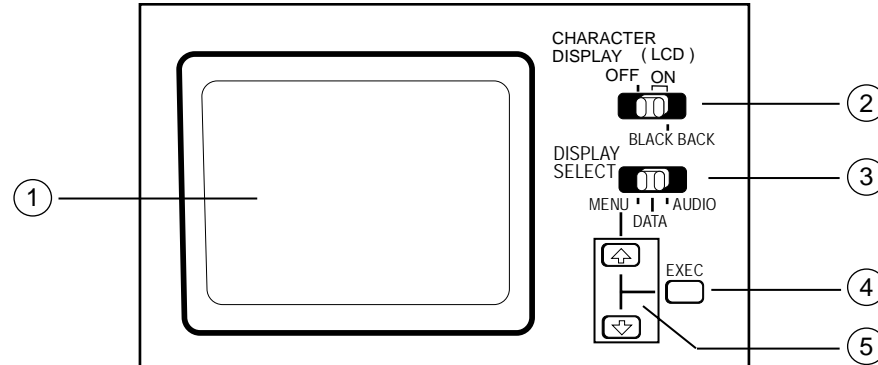
jsc48037_141b.cvx

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



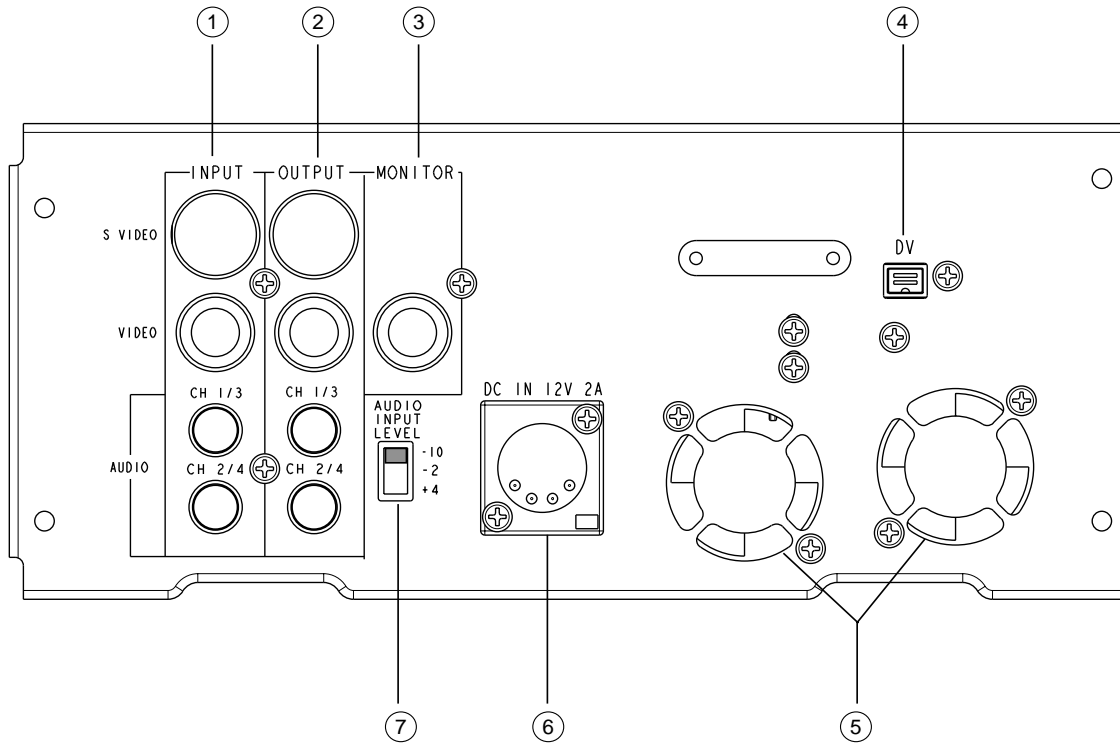
jsc48037_141c.cvx

①	LCD Monitor	Displays playback(live) video and superimposed text, audio levels, and menu data
②	CHARACTER DISPLAY (LCD) sw (Default = ON)	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 through 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 Fan (two)
- ⑥ DC IN Connector
- ⑦ AUDIO INPUT LEVEL sw (-10)

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DTV (Continued)

NOMENCLATURE (Continued)

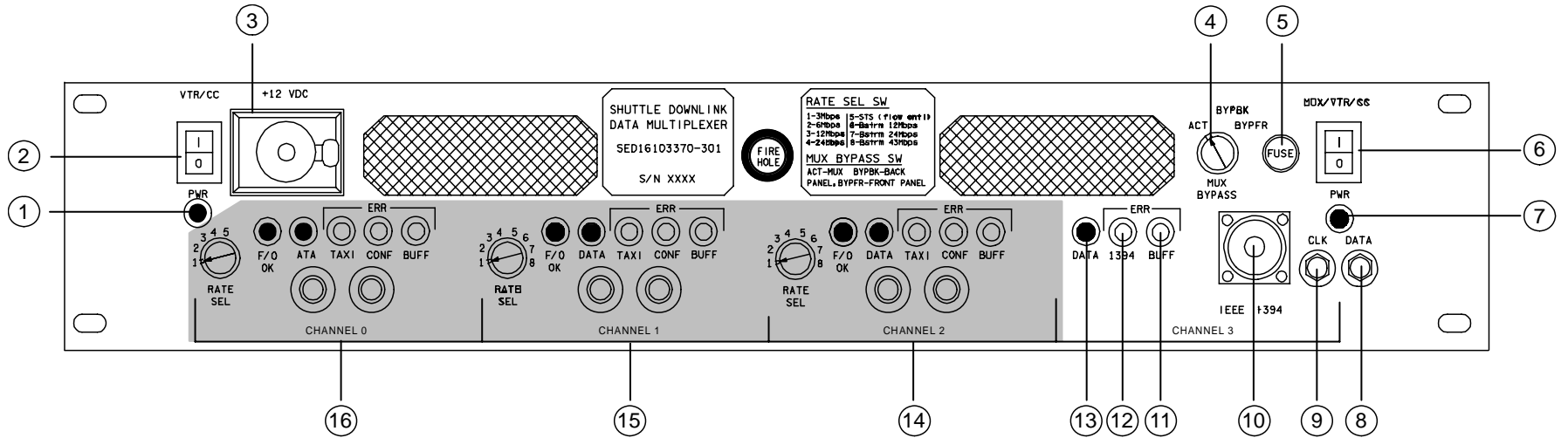
VTR (SONY DSR-25) – REAR PANEL (Concluded)

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 (No VI data)
	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. Default is -10. Is ignored in the VAR setting

DTV (Continued)

NOMENCLATURE (Continued)

MUX – FRONT



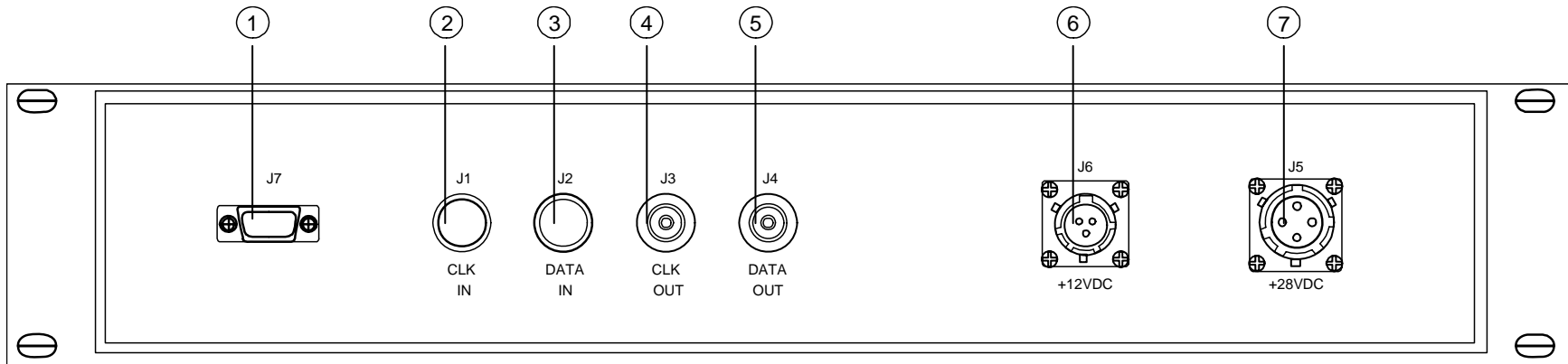
- | | |
|---------------------------|---------------------------------------|
| ① VTR/CC PWR LED (green) | ⑨ BYPFR CLOCK Connector |
| ② VTR/CC PWR sw | ⑩ IEEE 1394 Connector |
| ③ +12 VDC Connector (N/A) | ⑪ CHANNEL 3 BUFFER ERROR LED (yellow) |
| ④ MUX BYPASS sw | ⑫ CHANNEL 3 1394 ERROR LED (yellow) |
| 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)

jsc48037_059.cnv

DTV (Continued)

VTR (SONY DSR-25) NOMINAL MENU SETTINGS

MENU	SUB MENU
TC (TC/UB SET)	TC PRESET – N/A
	UB PRESET – N/A
	DV IN TC – INTERNAL
	TC MAKE – REGEN
	TC RUN – REC RUN
	TC FORMAT – AUTO

CM (CM SET)	CM SEARCH – ON
	TITLE DISP – ON
	LABEL DISP – ON
	TAPE LABEL – N/A
	ITEM ERASE – N/A
	ERASE ALL – N/A

DISP (DISPLAY SET)	DATA CODE – DATE (non-default)
	EE/PB SEL – EE
	LTR SIZE – NORMAL
	COLOR BAR – OFF
	DATE DISP – M/D/Y
	TIME DISP – 24H

V (VIDEO SET)	PB YNR – OFF
	PB CNR – OFF

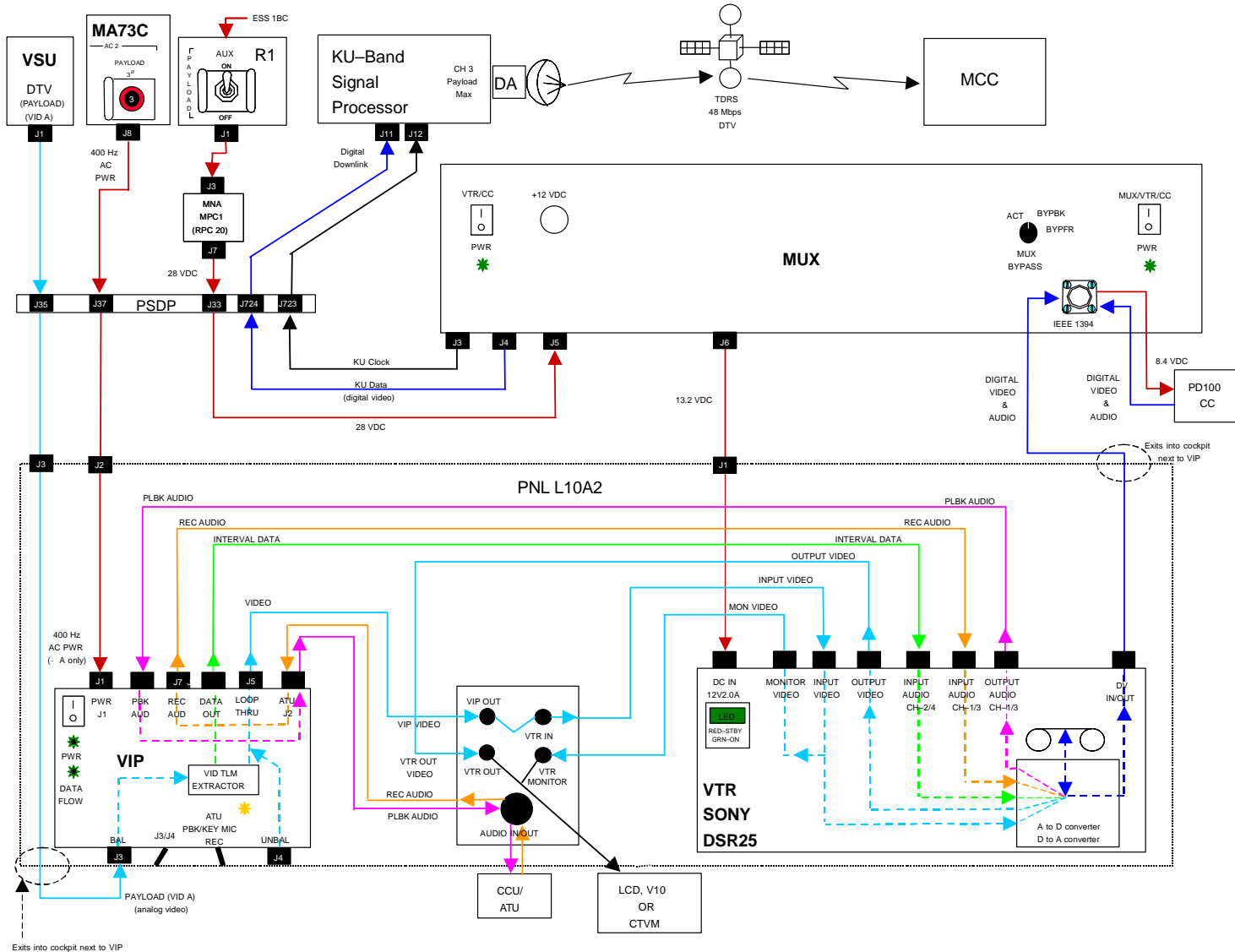
MENU	SUB MENU
A (AUDIO SET)	AUDIO MODE – FS48k (non-default)
	JOG AUDIO – OFF

VTR (VTR SET)	REC MODE – DVCAM
	AUTO INDEX – ON
	STILL PICT – AUTO
	FF/REW SPD – FF/REW
	DUPLICATE – N/A
	DV EE OUT – ON (non-default)
STILL TIME – 1 MIN (non-default)	
	FROM STILL – STOP

ETC (OTHERS)	COMMANDER – WIRELESS
	AC ON MODE – POWER ON (non-default)
	AUTO STBY – DISABLE
	BEEP – ON
	LCD BRIGHT – mid
	LCD COLOR – mid
	CLOCK SET – GMT
HRS METER – N/A	

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 pb – 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
- MON 2 If using CTVM:
 - √SOURCE – C
- R1 √PL AUX – ON
- MA73C √cb AC2 PL 3Φ – cl
- L10 (MUX)
 (VIP) √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**
- (VTR) √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) √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
- L10 (MUX)
 (VTR) √IEEE 1394 male cable connected to IEEE 1394 port
 - DISPLAY SELECT – MENU
 - ↓ pb – VTR, EXEC pb – push
 - ↓ pb – DVEE OUT, √ON
 - DISPLAY SELECT – DATA
- (MUX) √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) If CHANNEL 3 1394,BUFF LEDs – on, signal not reaching MUX for processing
 (VTR) | ON/STANDBY pb – push (red LED on)
- PD100 | If PD100:
 | PWR – OFF
- L10 (MUX) | MUX/VTR/CC PWR – off, wait 5 sec, on
 (VTR) | √ON/STANDBY LED – green
- PD100 | If PD100:
 | PWR – CAMERA
- | If no joy:
 | Repeat pwrndn per previous steps
 | Disconnect,reconnect IEEE 1394 cable
 | Repeat pwrup per previous steps
- | If no joy, √MCC
- | 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) DISPLAY SELECT – AUDIO
 √CHANNEL 2 AUDIO LEVEL METER indicates signal
 If signal indicated, LED failed
 Notify MCC, continue Nom Ops
 DISPLAY SELECT – DATA
(VIP) 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 pb – 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 pb – 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
DISPLAY SELECT – DATA

If no joy, √MCC

BPSMU

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BPSMU

BPSMU

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

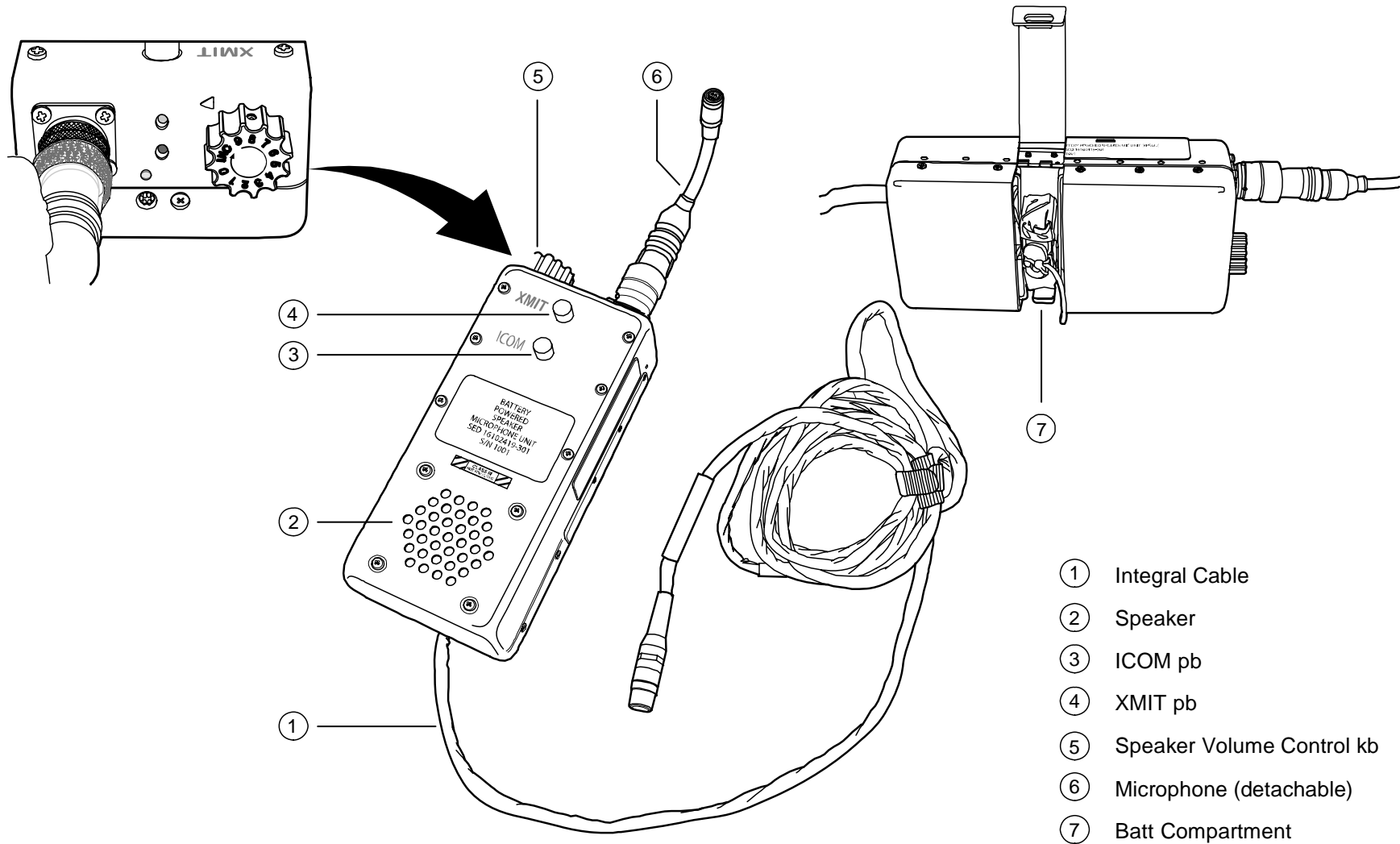
BPSMU CABLES – TV CONNECTIONS

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



jsc48037_068.cnv

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
 A7

PWR – ON (LED on)
 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

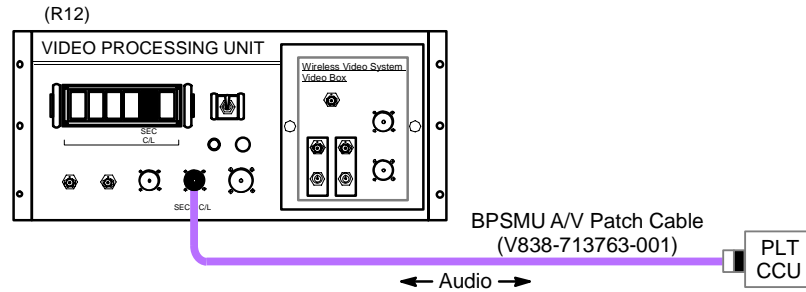
√CC video

O9

5. Config Comm System

R 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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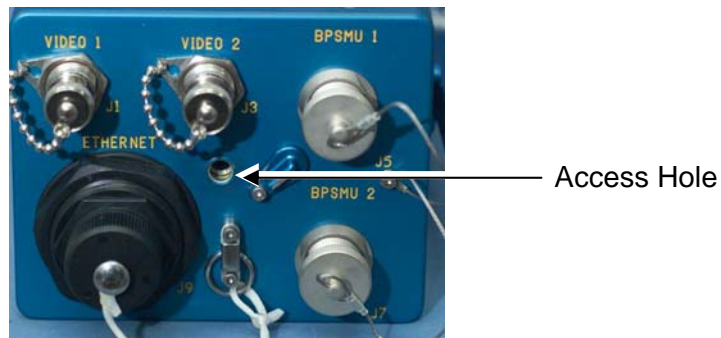
BPSMU (Continued)

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)



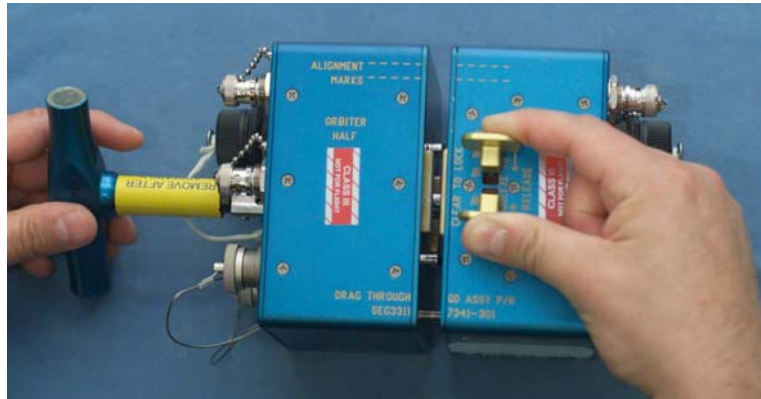
4. Remove Alignment Tool from Drag Through QD Handle Stowage (unthread ccw)
5. Place two Drag Through QD halves together, but not mated, and insert Alignment Tool into access hole



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.

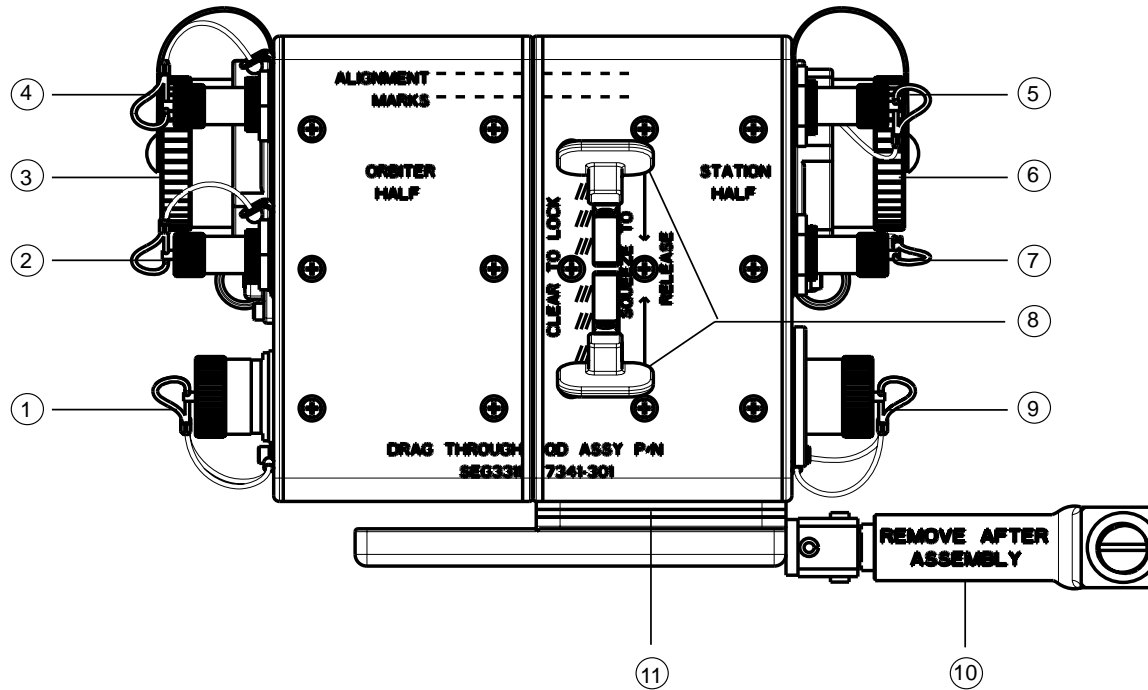


DRAG THROUGH QD DEACTIVATION

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

BPSMU (Continued)

DRAG THROUGH QD NOMENCLATURE



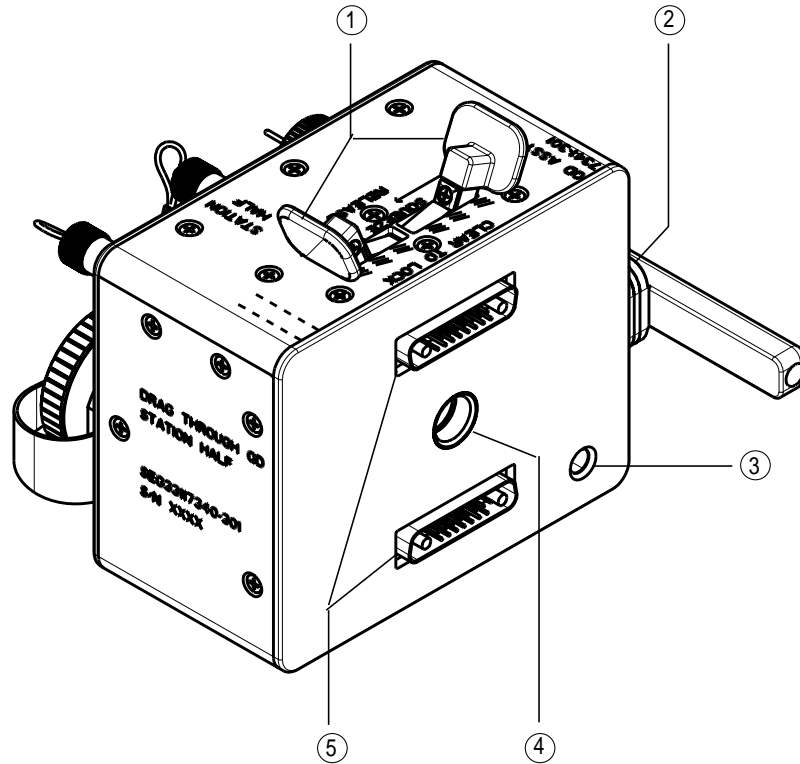
- | | |
|---|---|
| ① BPSMU #1 (J5), BPSMU #2 (J7) directly below | ⑦ Video #2 (J4) |
| ② Video #2 (J3) | ⑧ Quick Release Lever |
| ③ Ethernet (J9) | ⑨ BPSMU #1 (J6), BPSMU #2 (J8) directly below |
| ④ Video #1 (J1) | ⑩ Alignment Tool |
| ⑤ Video #1 (J2) | ⑪ Alignment Tool Holder |
| ⑥ Ethernet (J10)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

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BPSMU (Continued)

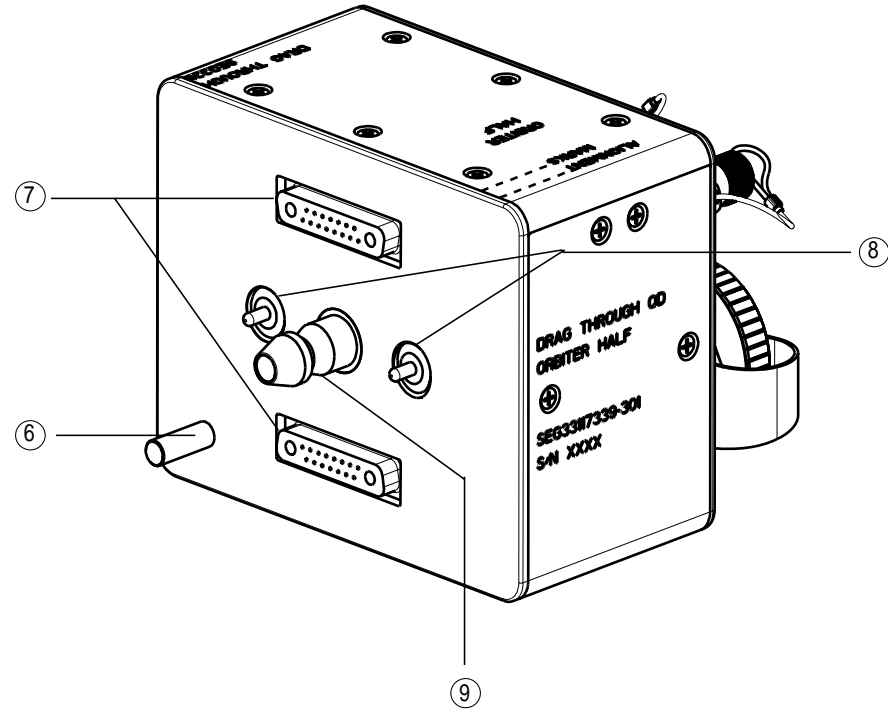
DRAG THROUGH QD NOMENCLATURE (Continued)

STATION HALF



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

ORBITER HALF

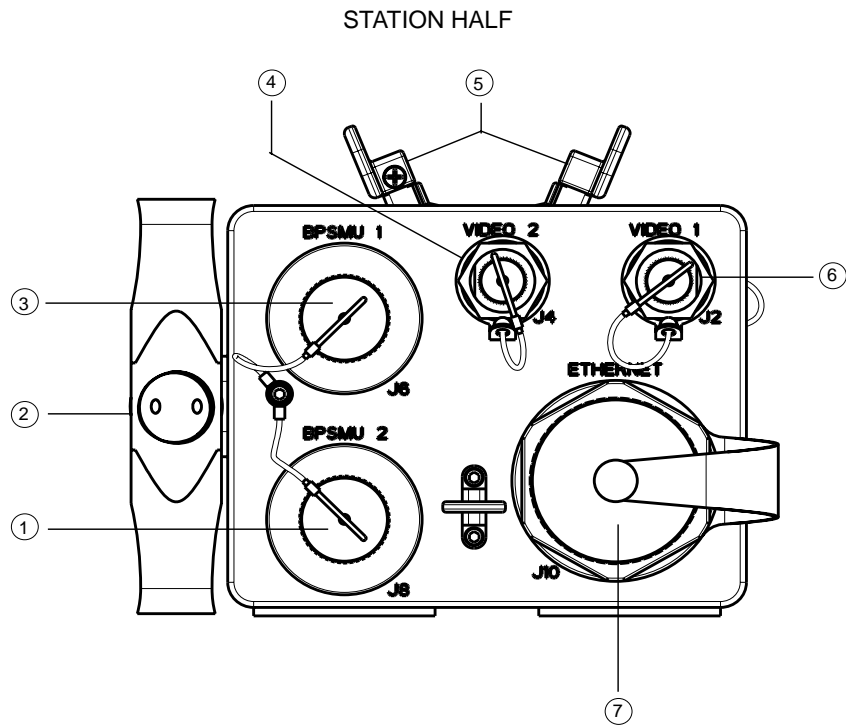


- ⑥ Alignment Pin
- ⑦ DB25 Female Connector
- ⑧ Ball Plunger
- ⑨ Center Locking Pin

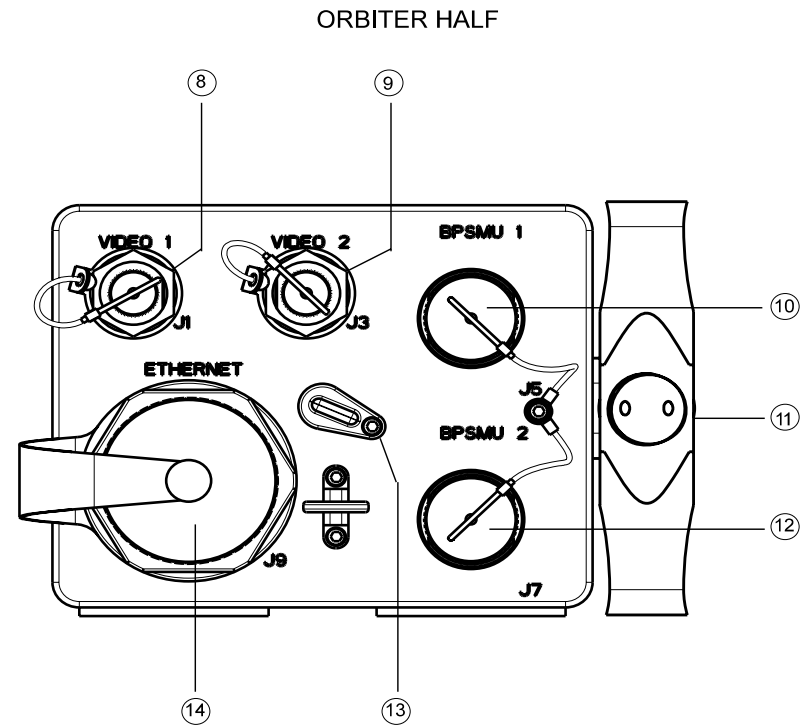
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BPSMU (Concluded)

DRAG THROUGH QD NOMENCLATURE (Concluded)



- ① BPSMU #2 (J8)
- ② Alignment Tool
- ③ BPSMU #1 (J6)
- ④ Video #2 (J4)
- ⑤ Quick Release Lever
- ⑥ Video #1 (J2)
- ⑦ Ethernet (J10)



- ⑧ Video #1 (J1)
- ⑨ Video #2 (J3)
- ⑩ BPSMU #1 (J5)
- ⑪ Alignment Tool
- ⑫ BPSMU #2 (J7)
- ⑬ Alignment Tool Access Hole Cover
- ⑭ Ethernet (J9)

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MINI-CAM

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LENS DATA.....	14-2
BRACKET DATA	14-2
NOMENCLATURE.....	14-3

MINI-CAM

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

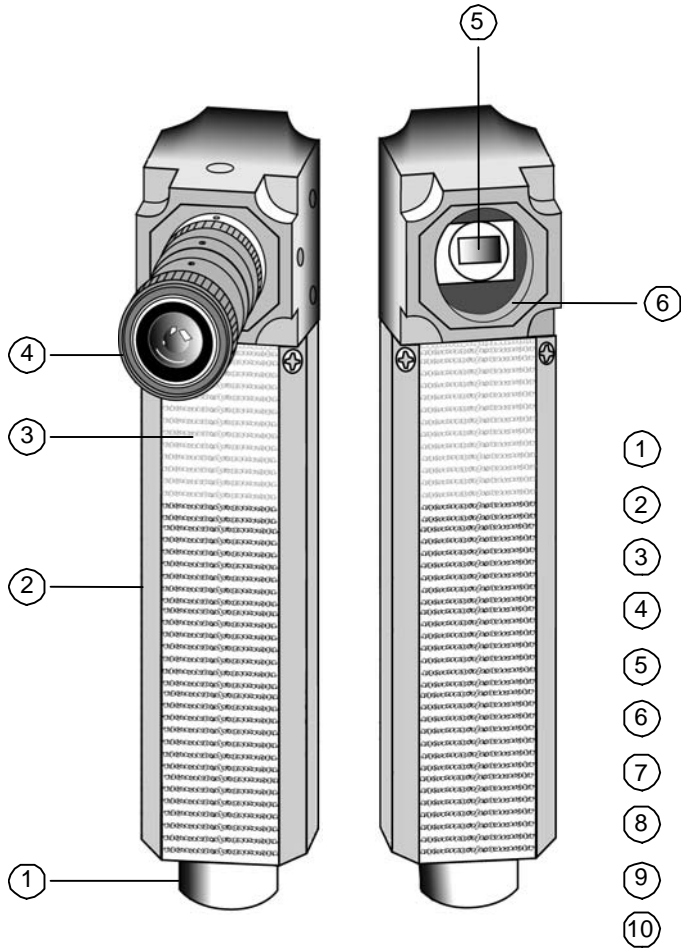
Lens	Aperture Range (f/stop)	Approximate Horizontal Field of View (FOV)	Minimum Focus Distance	Weight (lb)	Configuration Used
3.5mm	f/1.8-f/16	84.87°	Fixed	0.10	Glareshield, Aft Window
6.0mm	f/1.4-f/16	56.15°	0.3m	0.10	Aft Window
12.0mm	f/1.4-f/16	29.86°	0.5m	0.10	HUD
23.0mm	f/1.4-f/22	15.8°	0.2m	0.31	

BRACKET DATA

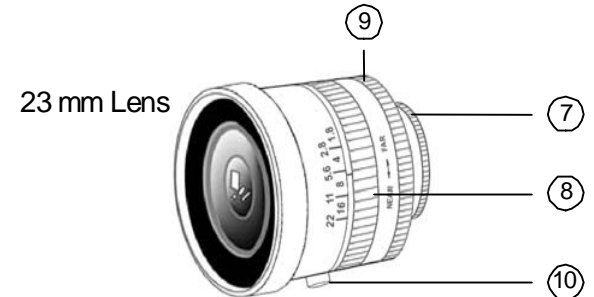
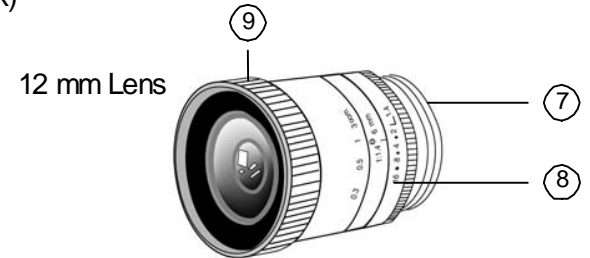
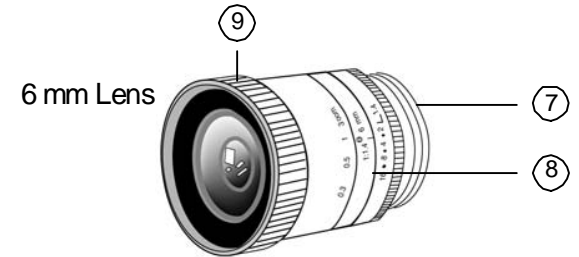
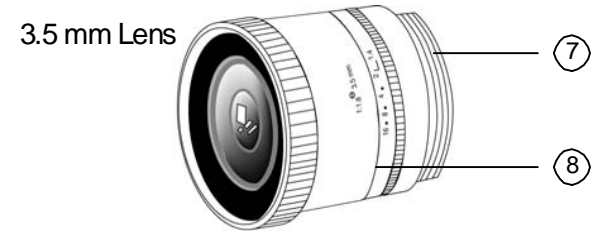
Bracket	Dimensions		Mount Type
	Length	Width	
Glareshield	9.5 in - 10.5 in	2 in	Velcro w/FDF Tether
Rear Window	12 in - 20 in	2 in	Velcro w/FDF Tether
HUD	4.5-in base 1.5-in extension 2-in rise	N/A	Thumbscrew w/Tie Wrap

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)**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

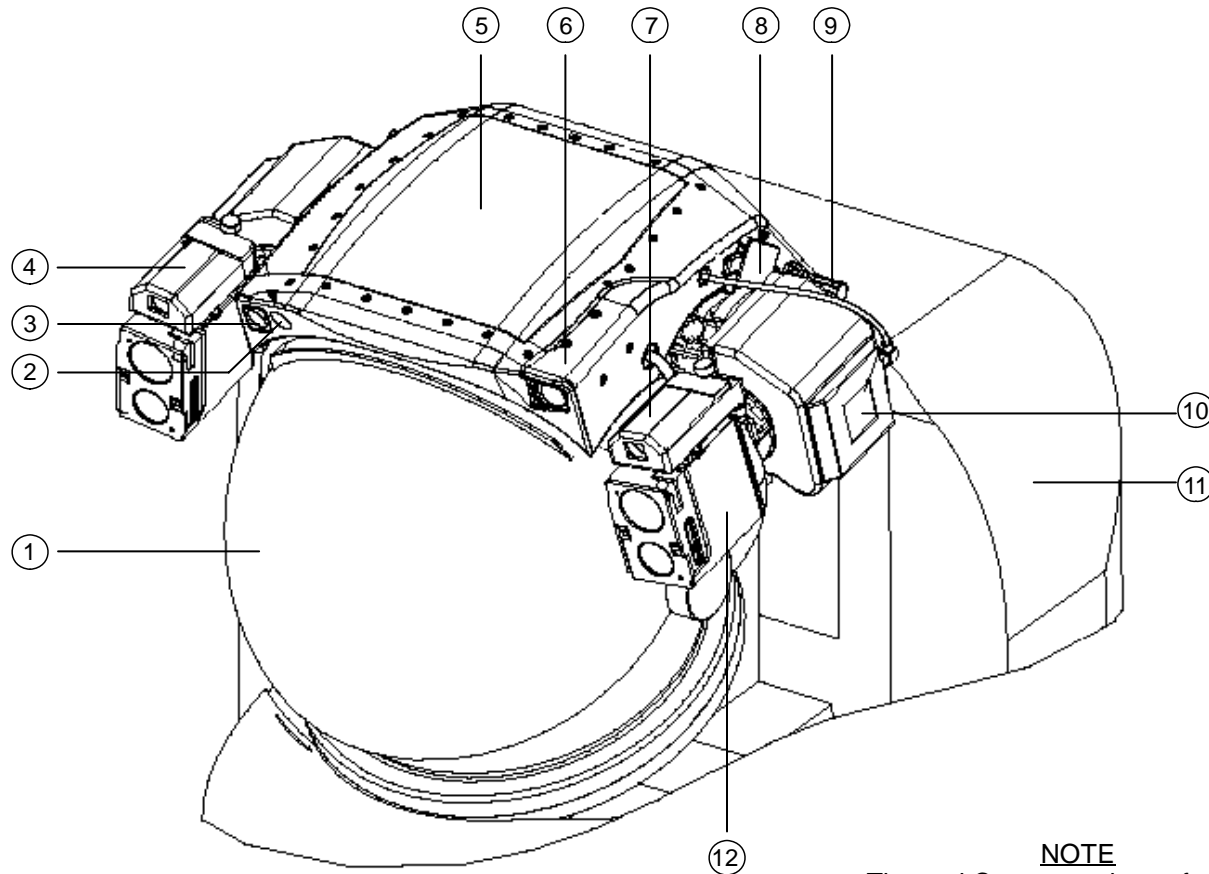
TELEMETRY/VIDEO LINK: S-BAND

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)

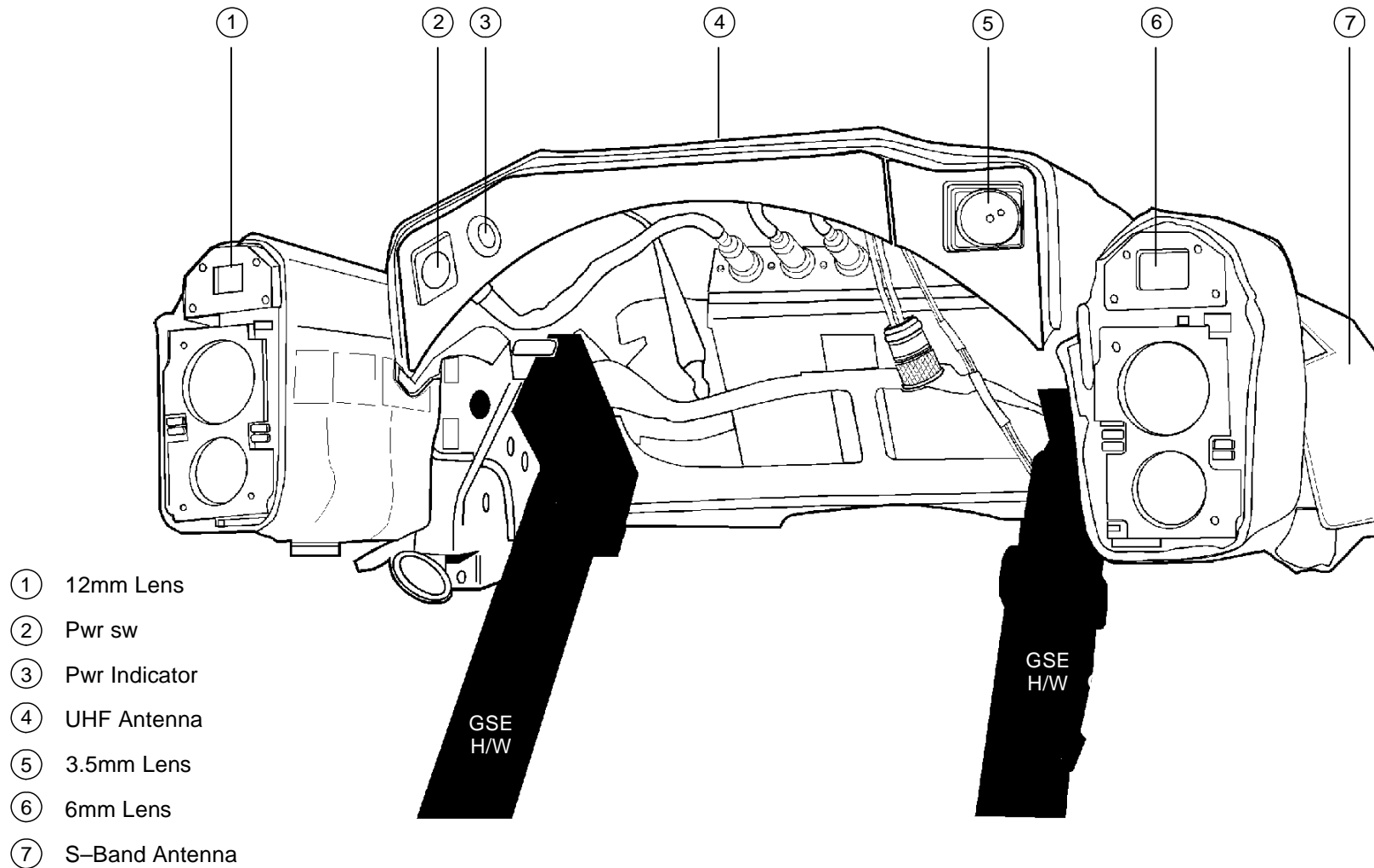
NOTE
Thermal Cover not shown for clarity

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WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE (Continued)

RF CAMR MOUNTED TO EMU HELMET LIGHT

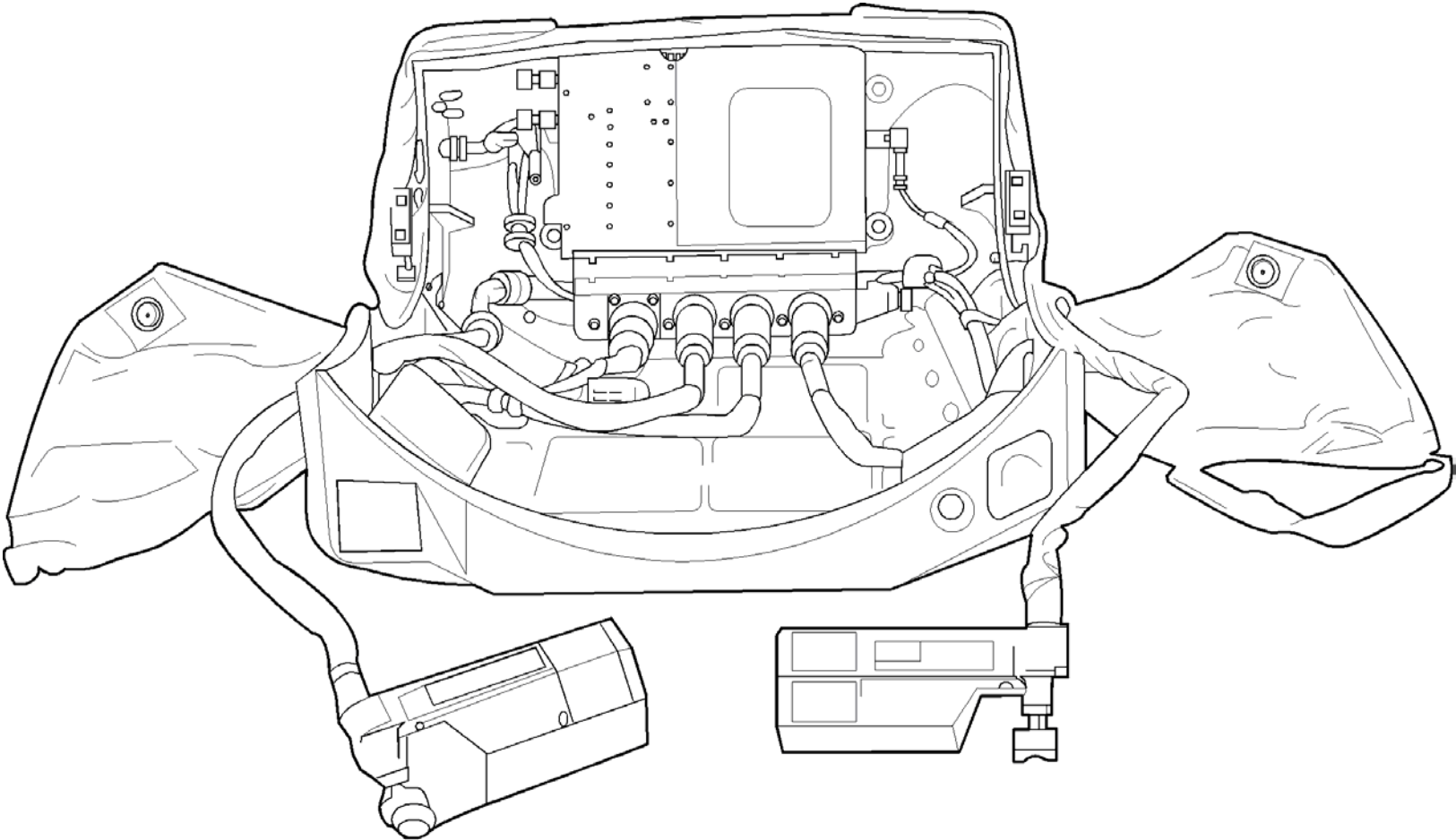


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WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE (Concluded)

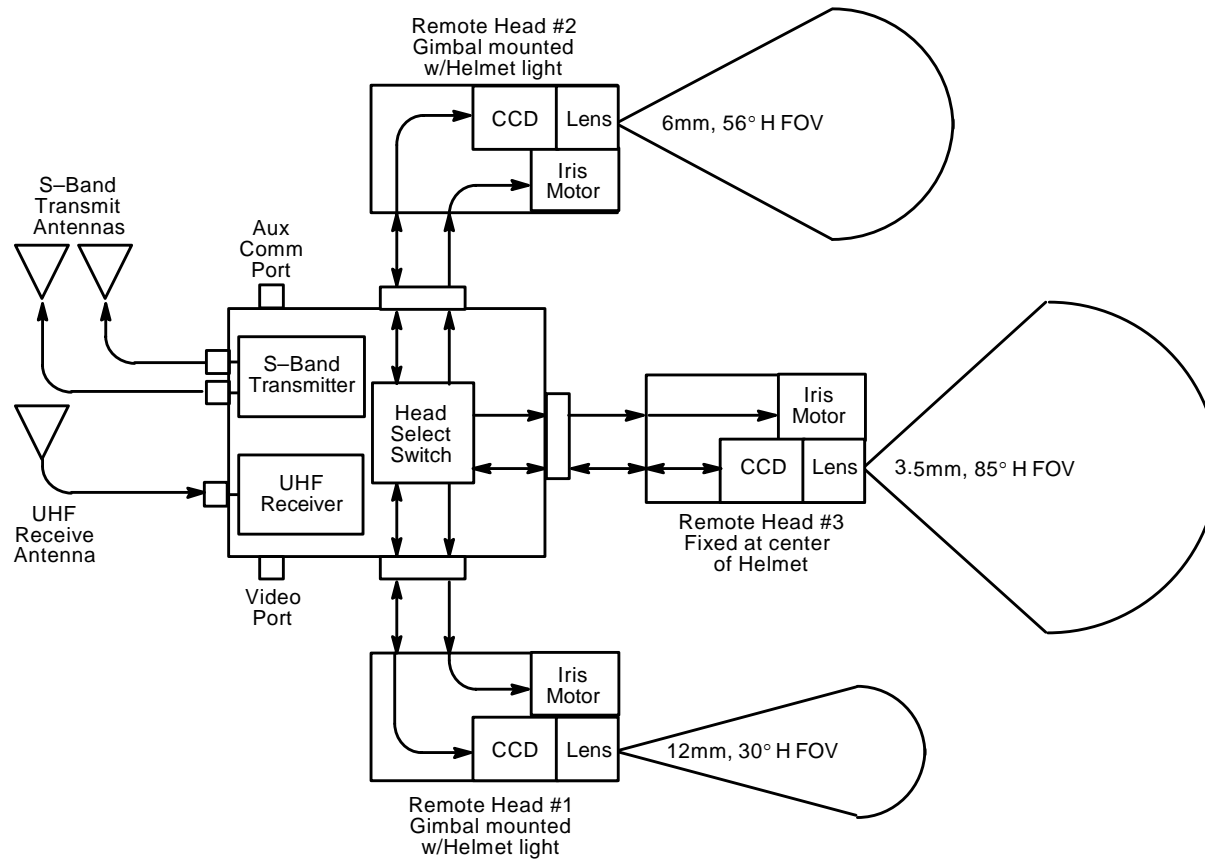
RF CAMR SHELL



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WIRELESS VIDEO SYSTEM (WVS) (Continued)

RF CAMR ELECTRONICS

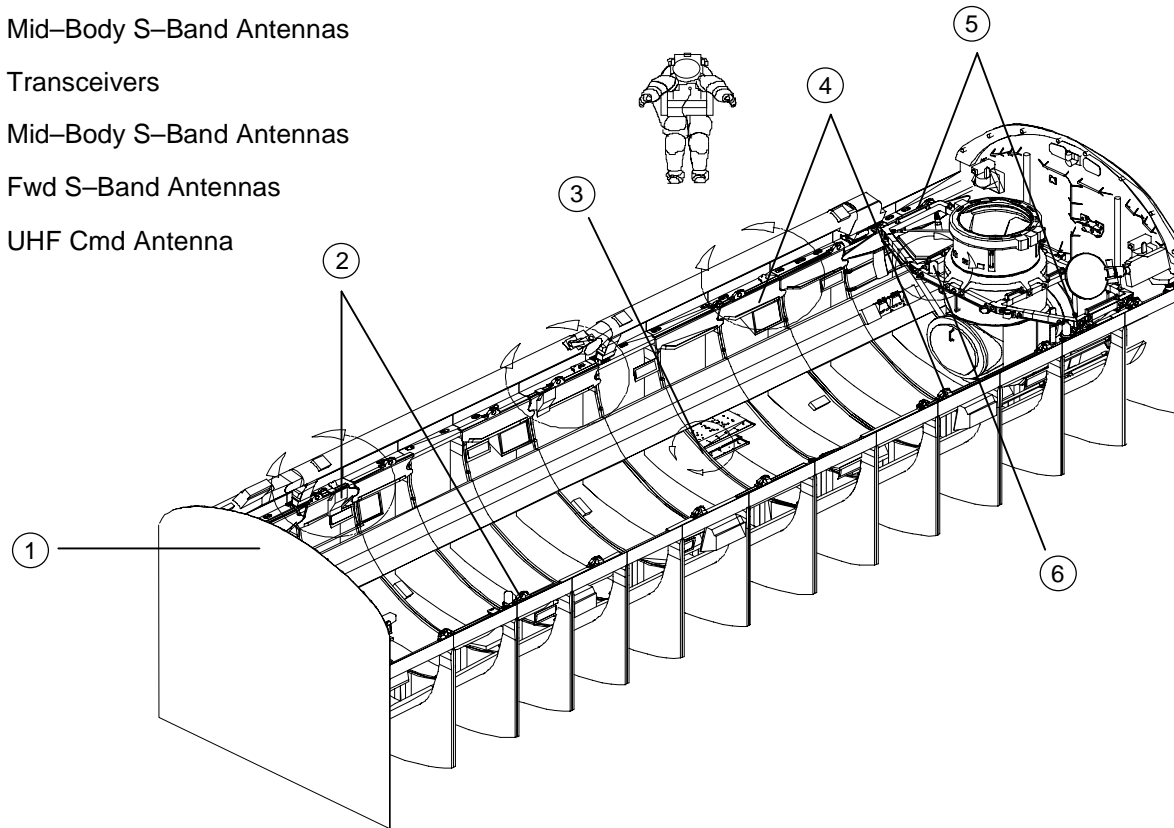


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WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS PLB MOUNTED H/W

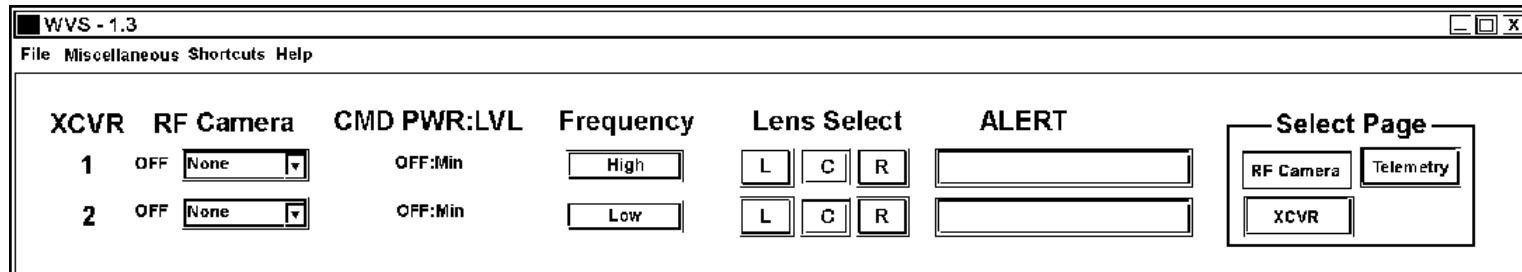
- ① Aft Bulkhead Antenna
- ② Mid-Body S-Band Antennas
- ③ Transceivers
- ④ Mid-Body S-Band Antennas
- ⑤ Fwd S-Band Antennas
- ⑥ UHF Cmd Antenna



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WIRELESS VIDEO SYSTEM (WVS) (Continued)

SOFTWARE – TOP STATUS AREA



jsc48037_080.cnv

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

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

RF CAMERA Pulldown

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

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

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

Frequency Status/Cmd
[High / Low]

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

Lens Select Cmd
[L,C,R]

Selects operational lens. Default is Center

ALERT Msg Display

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

The screenshot displays the WVS - 1.3 software interface for the RF CAMR page. The window title is "WVS - 1.3" and the menu bar includes "File", "Miscellaneous", "Shortcuts", and "Help".

XCVR | **RF Camera** | **CMD PWR:LVL** | **Frequency** | **Lens Select** | **ALERT** | **Select Page**

1 OFF None [None] OFF:Min High [L] [C] [R] [Empty] [Empty]
2 OFF None [None] OFF:Min Low [L] [C] [R] [Empty] [Empty]

None C None C

Lens Iris Control Close [Left] [Right] Open [Bar]
Electronic Shutter [Auto]
White Balance Control [Auto]

Advanced Control

Automatic Gain Control [Disabled]
Power [ON] [OFF] [MUTE]
S-Band Level [Dynamic]

The interface is divided into two main columns for camera 1 and camera 2. Each column has a top section for basic settings (XCVR, RF Camera, CMD PWR:LVL, Frequency, Lens Select, ALERT) and a bottom section for advanced controls (Lens Iris Control, Electronic Shutter, White Balance Control, Automatic Gain Control, Power, S-Band Level). The "Select Page" box on the right contains buttons for "RF Camera", "Telemetry", and "XCVR".

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

WS - 1.3
File Miscellaneous Shortcuts Help

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

Transceiver 1

CMD Power

Antenna

Transceiver 2

CMD Power

Antenna

Advance Controls

Chroma Stablizer

IF

CMD Level

Chroma Stablizer

IF

CMD Level

jsc48037_082.cnv

WIRELESS VIDEO SYSTEM (WVS) (Continued)

SOFTWARE – XCVR PAGE (Concluded)

CMD Power
[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

Antenna
[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

Chroma Stabilizer
[On,Off]

NOT USED

Intermediate Frequency (IF)
[Wide,Narrow]

Controls bandwidth sampled for RF Camr return signal. Changed to Narrow during signal strength troubleshooting

CMD Level
[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
[] [] [X]

File Miscellaneous Shortcuts Help

XCVR

1 OFF

2 OFF

RF Camera

OFF:Min

OFF:Min

CMD PWR LVL

High

Low

Frequency

L C R

L C R

Lens Select

L C R

L C R

ALERT

Select Page

RF Camera Telemetry

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	32 M
??? -1 M RM	-1.00 M	-1 M	0.00 M	0.00 M	32 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

RF CAMERA

Displays RF Camr title

Lens

Displays currently selected lens

[L,C,R]

UHF Signal Strength

Displays cmd link signal strength in dB seen at RF Camr

[nom = -120 to -59]

UHF RX Good

NOT USED

Pwr Voltage

Displays RF Camr system voltage

[nom = 12.8]

Pwr Amperes

Displays RF Camr system current

[nom = 0.40]

Temperature Electronics

Displays RF Camr electronics temp in degC. Alert range = -30° to -35° C and +80° to +85° degC. Caution range = <-35° and >+85° degC

[nom = 13 to 30]

Temperature L,C,R

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

[nom = 0 to 33]

Transceiver Telemetry

XCVR 1,2 Temperature

Displays XCVR temp in degC. Alert range = -40° to -35° C and +80° to +85° C. Caution range = <-40° and >85° C

[nom = 18 to 37]

S-Band Signal Strength

Displays return signal strength seen at XVCR in dB

[nom = 97.5 to -10.5]

S-Band Antenna Select

Displays which S-Band antenna the XCVR is using to get video signal

S-Band Antenna Mode

Displays XCVR antenna selection mode

[Auto,Manual]

Power Voltage

Displays XCVR system voltage

[nom = 12.42]

Power Amperes

Displays XCVR system current

[nom = 1.10]

Quads 1,2

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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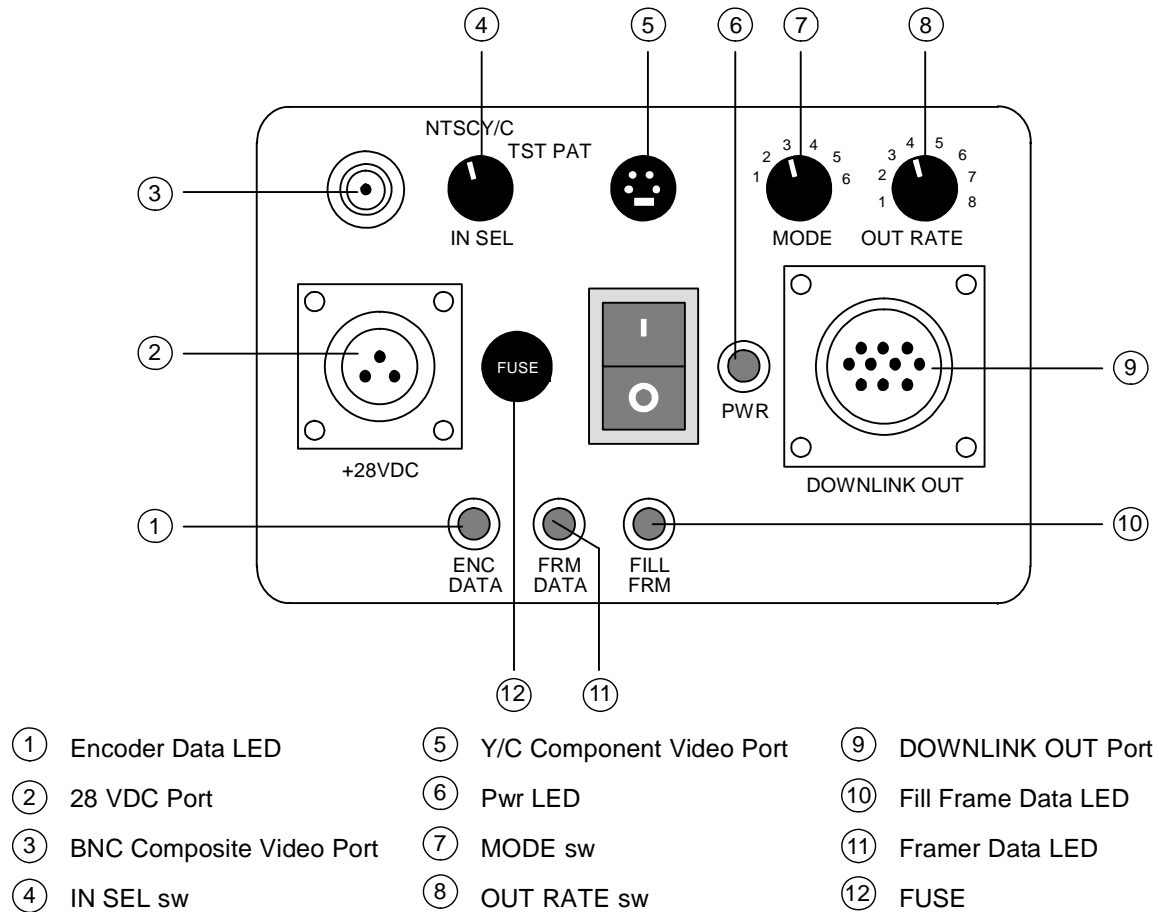
SSV

SEQUENTIAL STILL VIDEO (SSV)

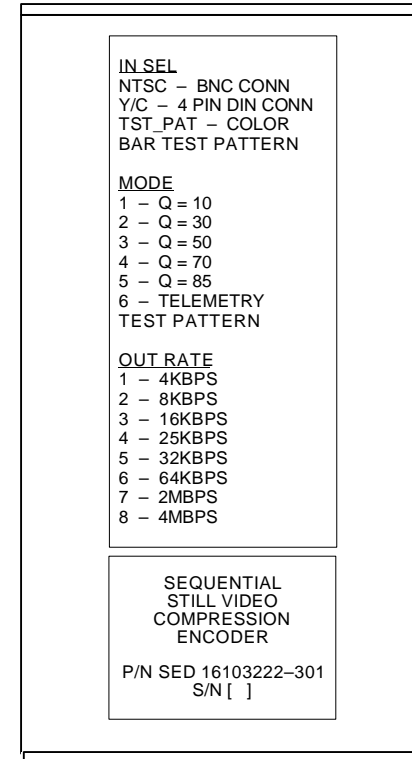
SPECIFICATIONS

DIMENSIONS: 8.5 in (L) x 4.245 in (W) x 2.72 in (H)
 PWR: 28V
 FUSE: 2A
 WEIGHT: 3.02 lb

NOMENCLATURE



TOP DECAL



jsc48037_085.cnv

SEQUENTIAL STILL VIDEO (SSV) (Continued)

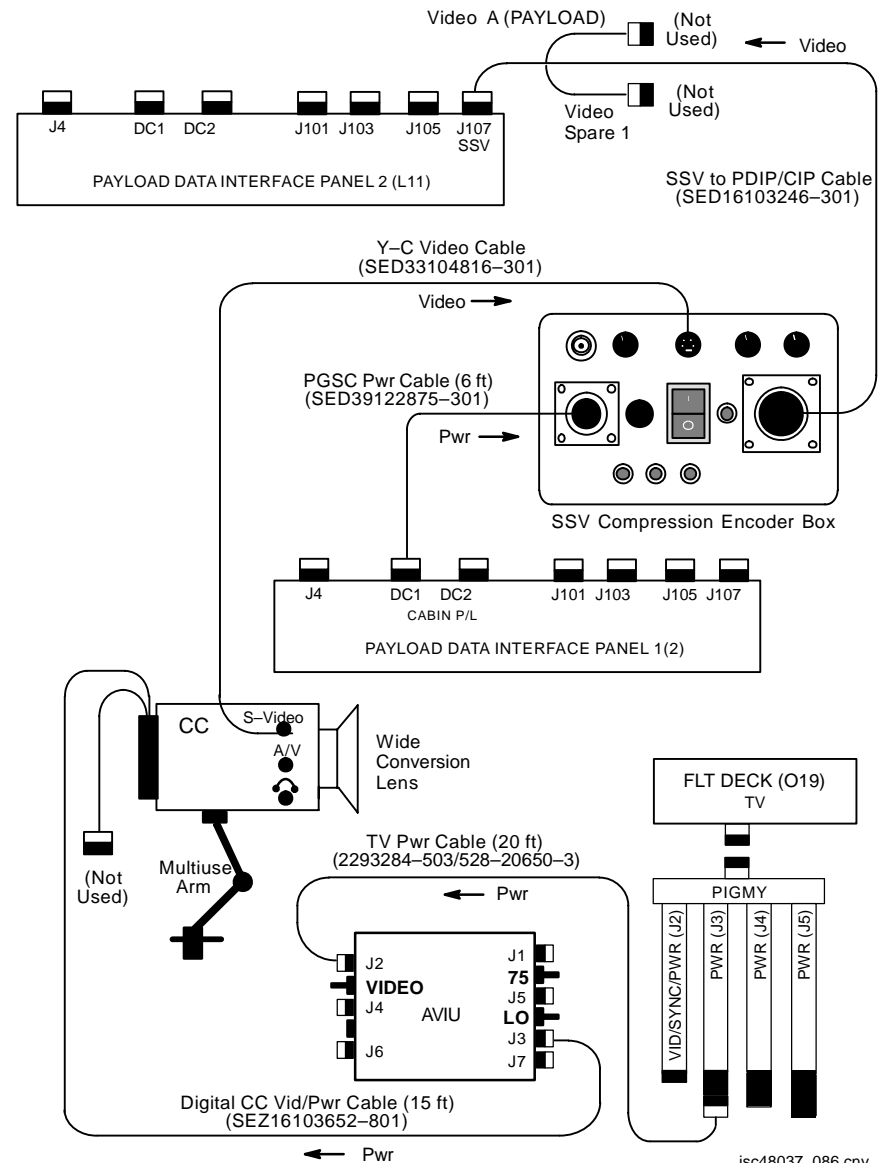
CAMCORDER VIA SSV

1. Config per dwg at right
2. Camcorder Settings

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

O19
 CC √TV 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 (PHOTO/TV FS, SCENES) |
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 (PHOTO/TV FS, SCENES) |
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) (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
- L11
(PDIP 2)
2. TV System
Go to DEACTIVATION (Cue Card, TV) as reqd

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

BINOCULARS

PAGE

SPECIFICATIONS..... 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

FIBERSCOPE

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FIBERSCOPE

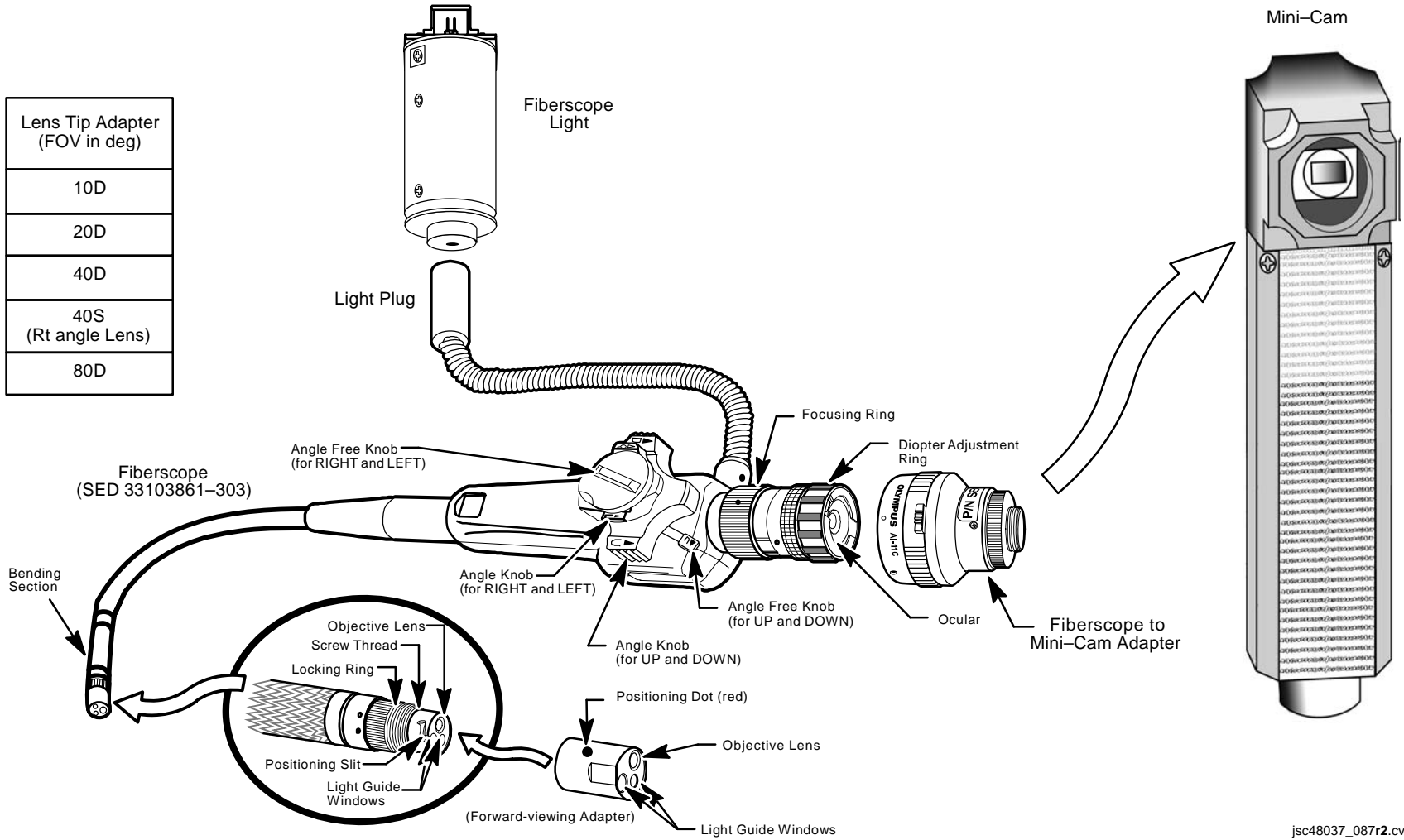
FIBERSCOPE

SPECIFICATIONS

LIGHT PWR: Orbiter – 6V via IFM Breakout Box

NOMENCLATURE

Lens Tip Adapter (FOV in deg)
10D
20D
40D
40S (Rt angle Lens)
80D



jsc48037_087r2.cvx

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:
A7 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
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

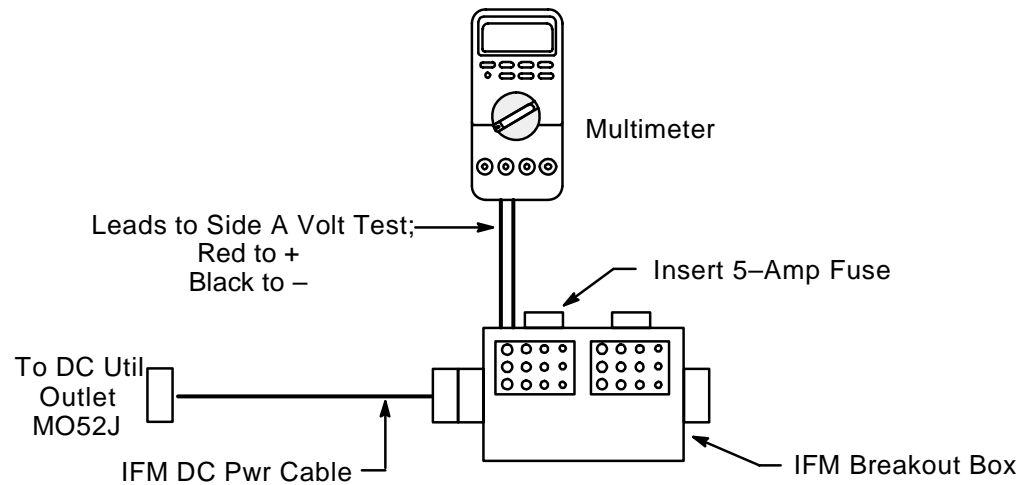
DEACTIVATION

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:
O19(MO58F) 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 – OFFb. 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)

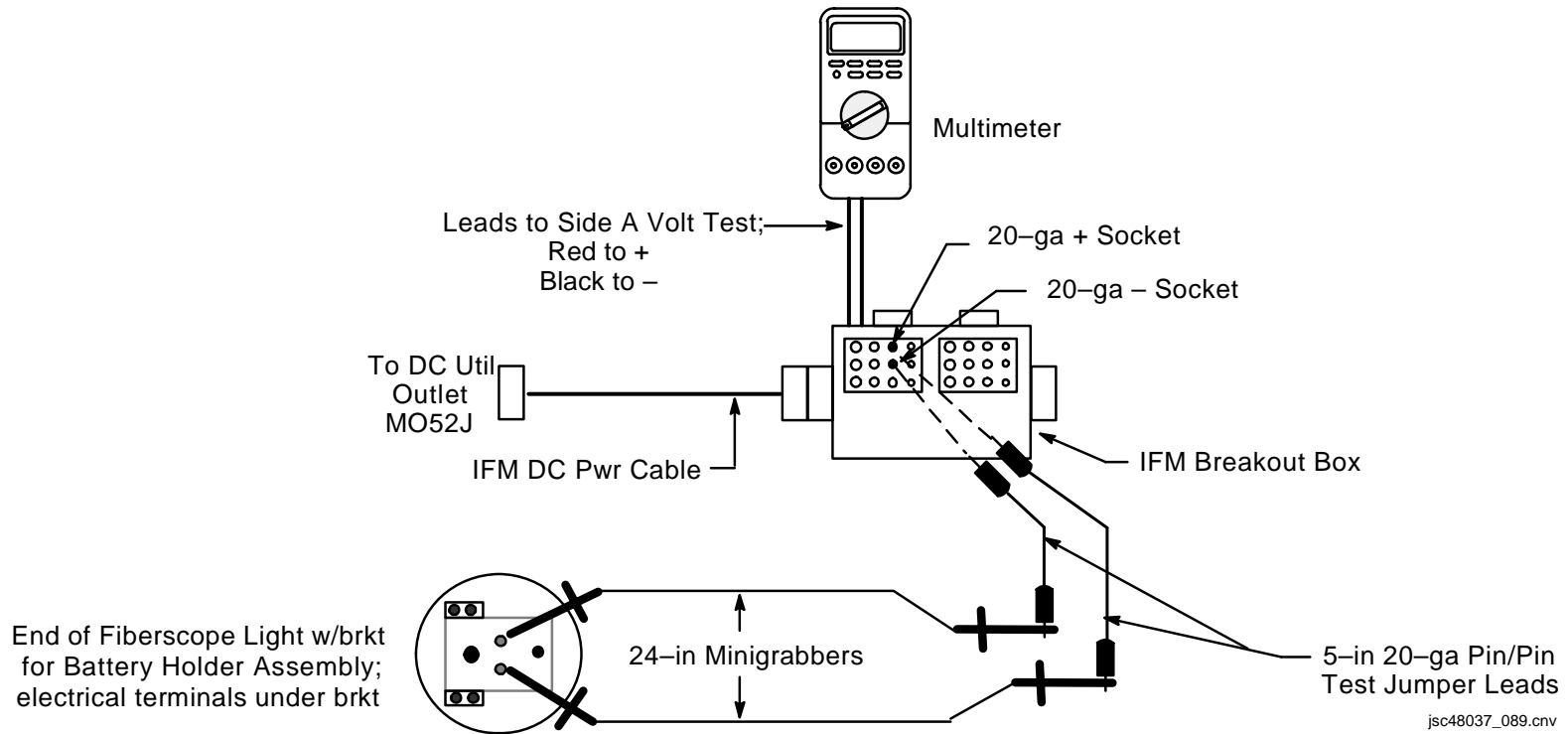
FIBERSCOPE LIGHT PWRUP (30 min) (Continued)

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

LASER DYNAMIC RANGE IMAGER (LDRI)

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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: LaserTeILT-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

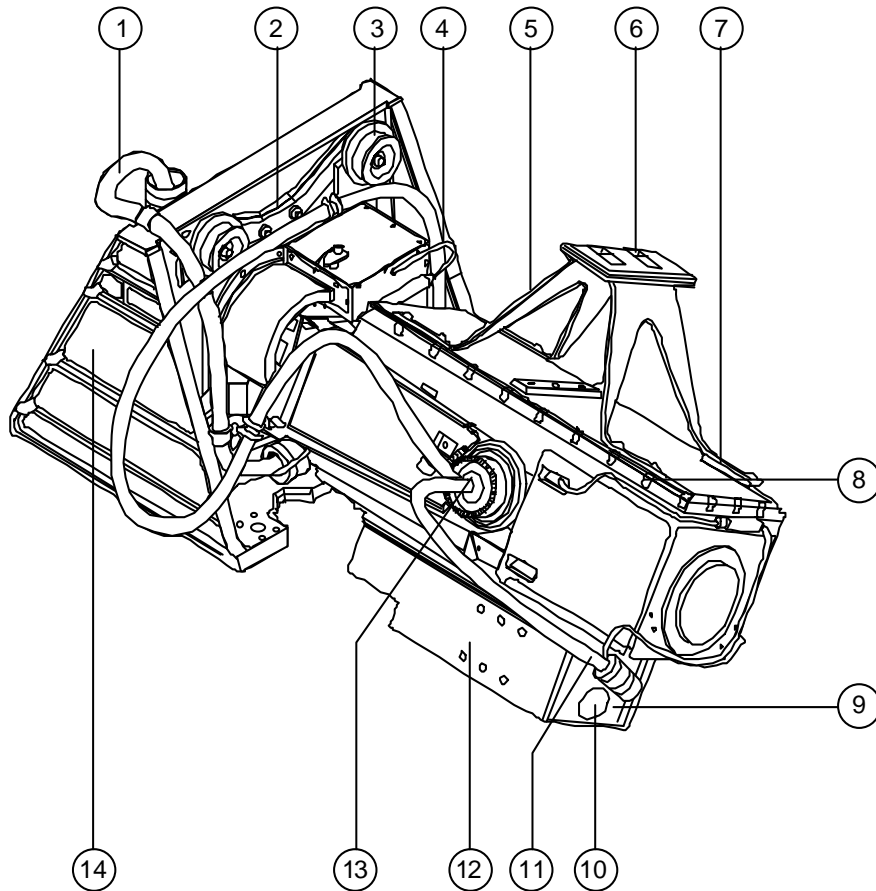
WEIGHT: 6.5 lb + 3 lb counter-weight
DIMENSION: 11 in (L) x 5.88 in (W) x 4.0 in (H)
PWR: 28V +/- 4V

LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

NOMENCLATURE

NOTE

Thermal covers are not depicted



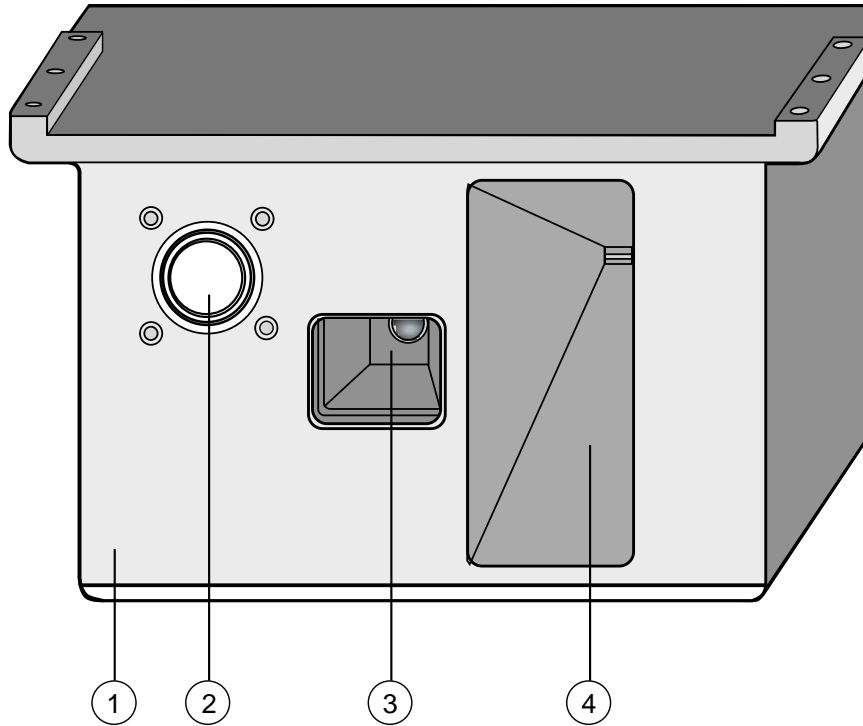
- ① W601 Interface Cable Assembly (EVA releasable at boom I/F)
- ② Isolator Plate
- ③ Isolator (x4)
- ④ PTU External Thermistor Interface Cable*
- ⑤ Counterweight Support
- ⑥ Counterweight
- ⑦ ITVC
- ⑧ ITCV External Thermistor Interface Cable*
- ⑨ LDRI Laser Diffuser
- ⑩ LDRI Camera Orifice
- ⑪ LDRI 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.cvx

LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

NOMENCLATURE (Concluded)

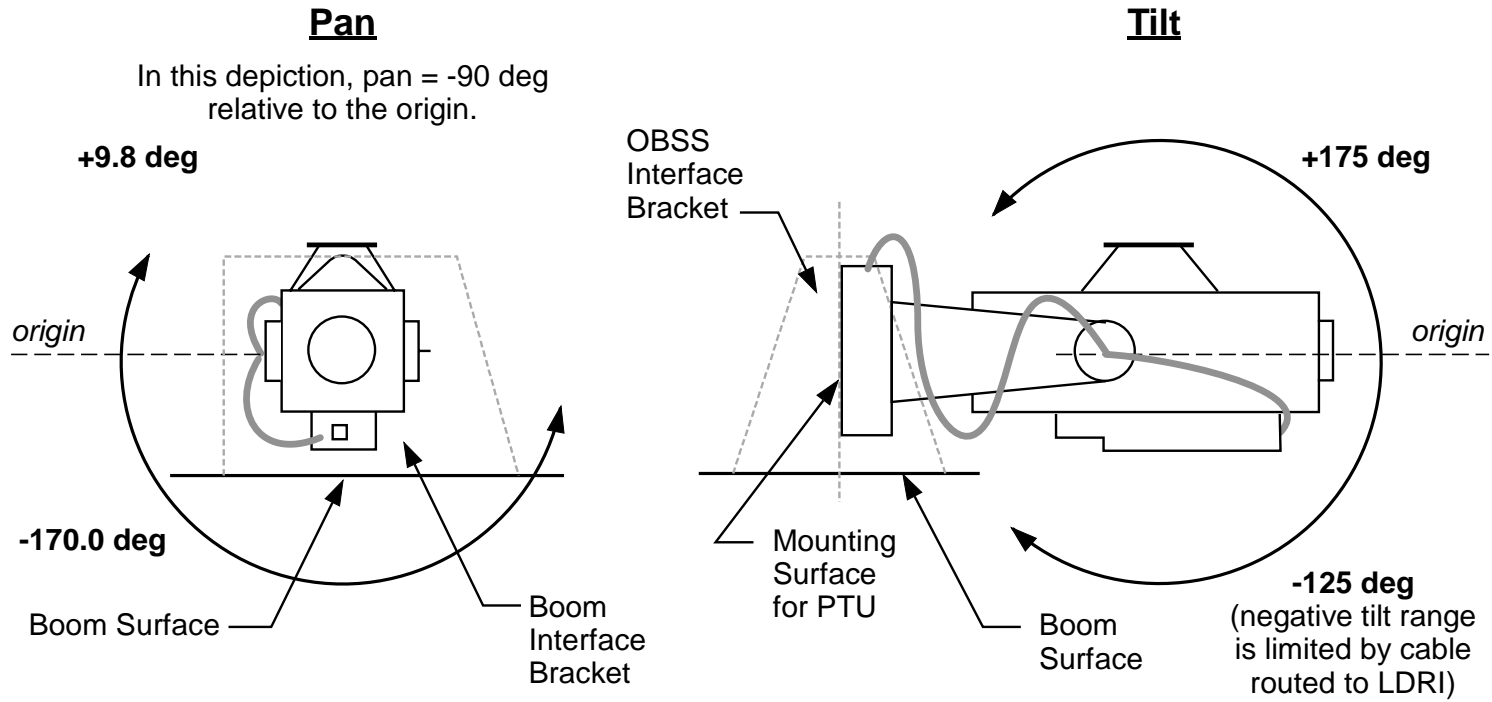


- ① LDRI Front Face
- ② Power/Sync Input and Video Output
- ③ Camera Orifice
- ④ Laser Orifice (covered by diffuser)

jsc48037_118r3.cvx

LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

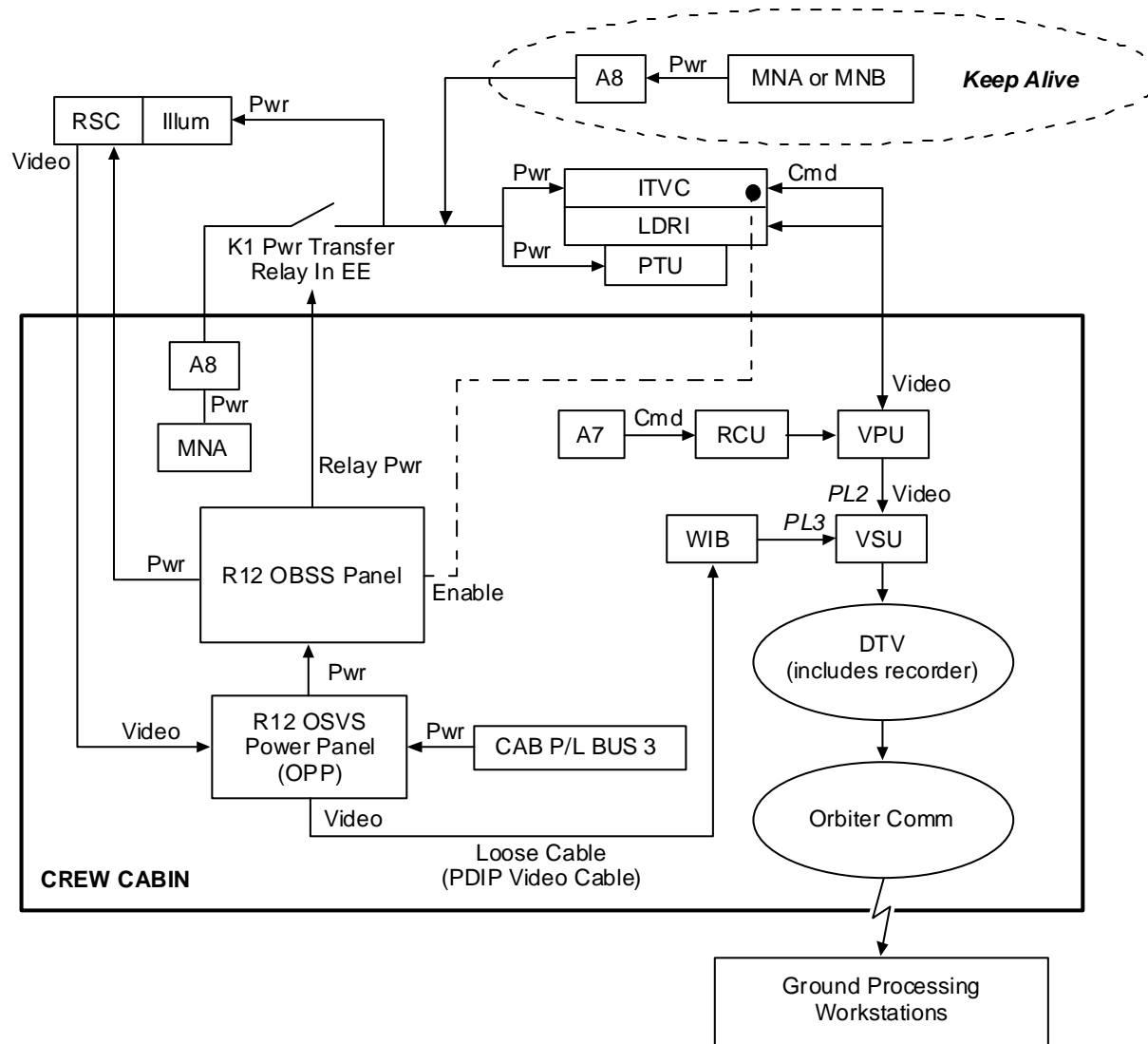
OBSS PTU PAN AND TILT RANGES



jsc48037_119r2.cvx

LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

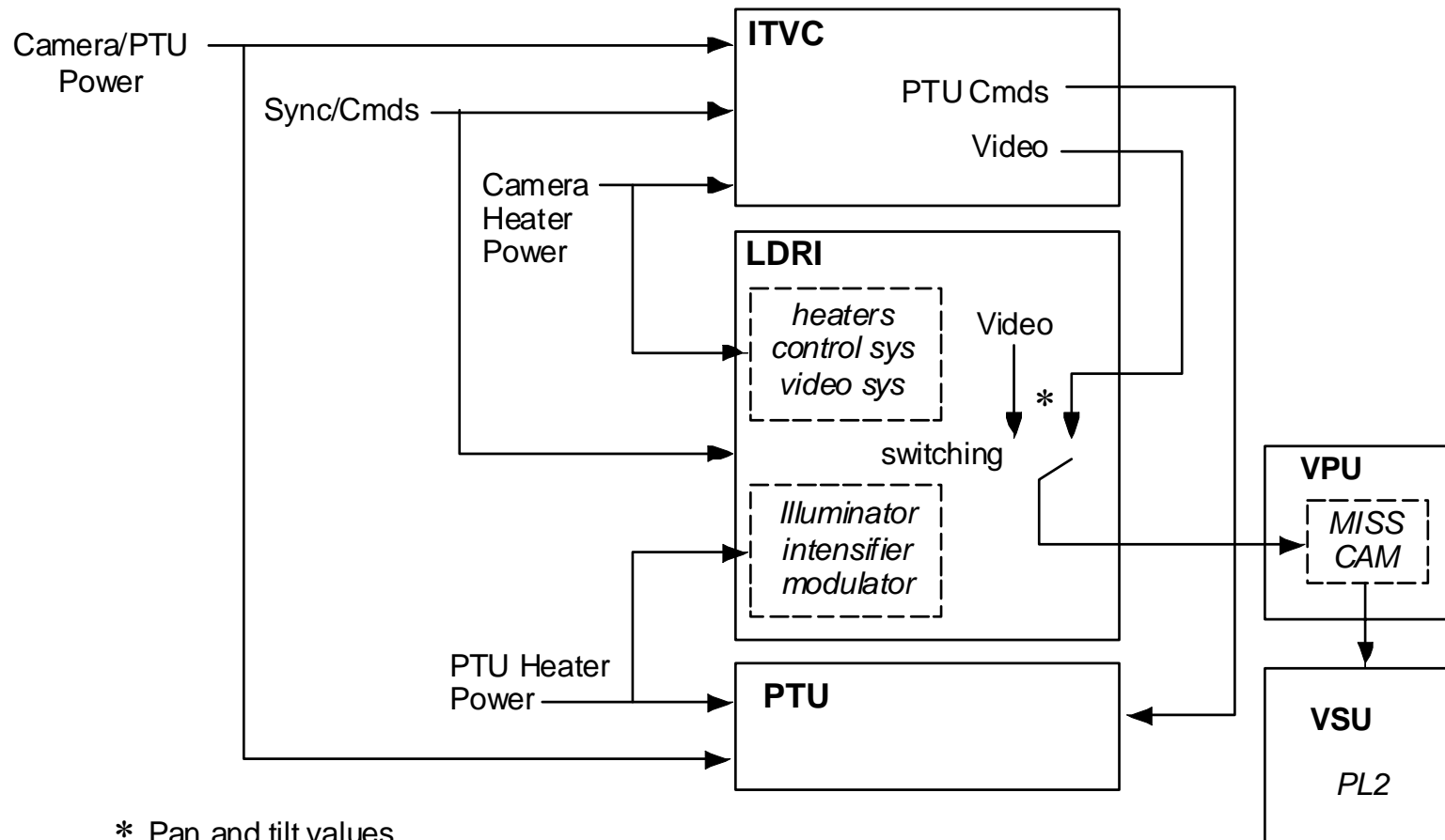
FUNCTIONAL FLOW



jsc48037_120r2.cvx

LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

ITVC, LDRI, AND PTU INTERACTIONS



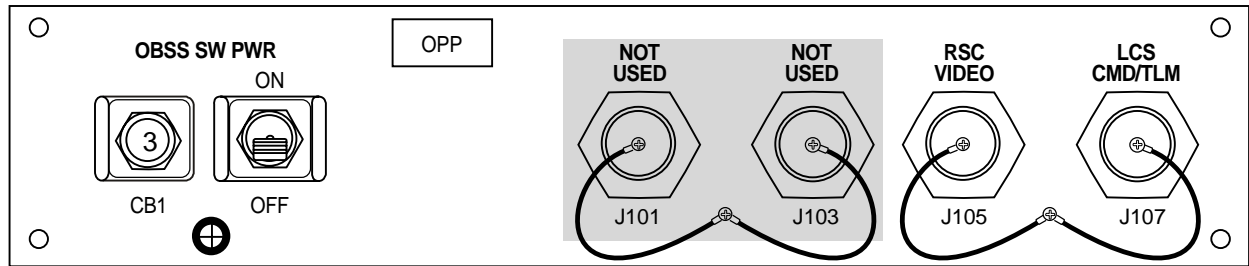
* Pan and tilt values
for display on MON

jsc48037_121r2.cvx

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

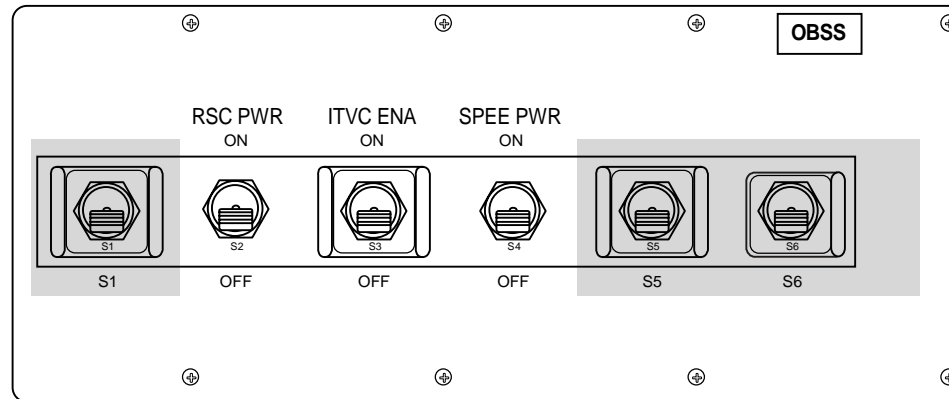
LCS CMD/TLM (J107)

- 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

R12



jsc48037_124r2.cvx

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

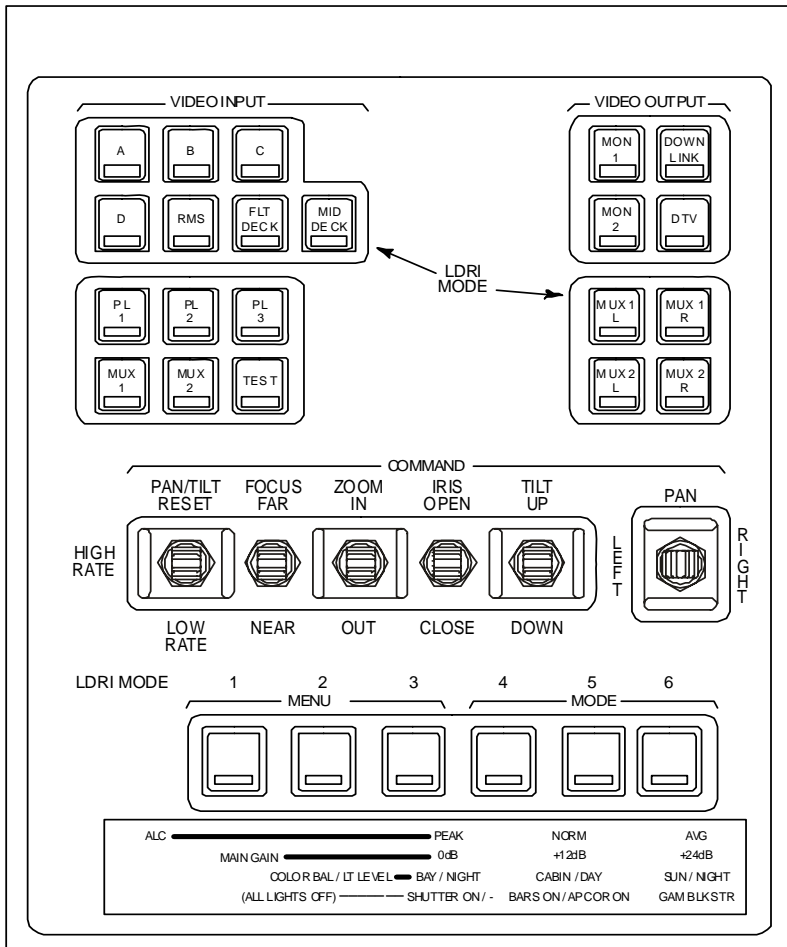
SPEE PWR (S4)

- 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



jsc:48037_125r3.cvx

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 – 10 (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

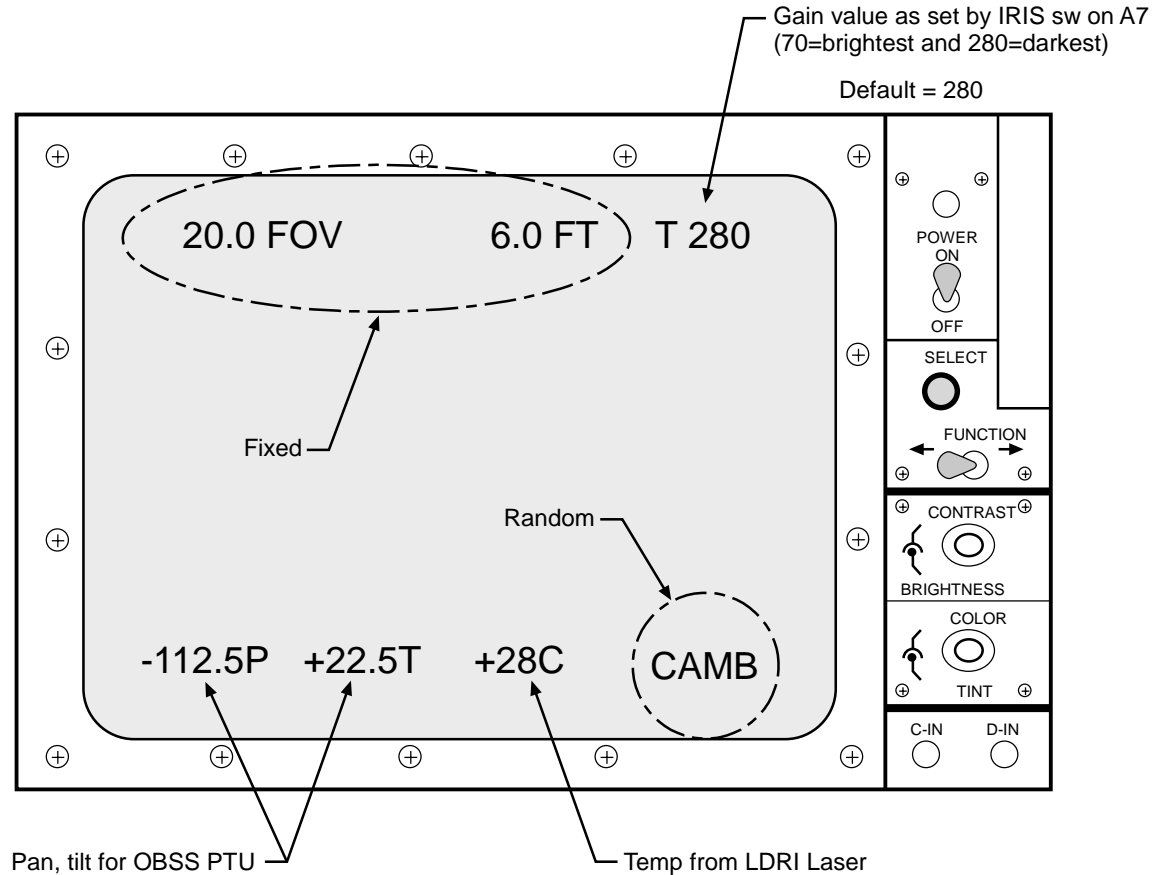
- Six MODE/MENU pb, left to right, allow selection of LDRI modes 1 thru 6:
 - MODE 1 – STANDBY
 - MODE 2 – ILLUMINATOR
 - MODE 3 – 2D
 - MODE 4 – 2D GAMMA
 - MODE 5 – 3D
 - MODE 6 – 3D GAMMA
- If OBSS/ITVC cntl selected (by depressing VID OUT pb selected for PL2) while in LDRI modes 3(4,5,6), LDRI video 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



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

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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: Refer to LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (PHOTO/TV FS, REF PROC)

HEATER PWR MODES/SOURCES: Refer to LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (PHOTO/TV FS, REF PROC)

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

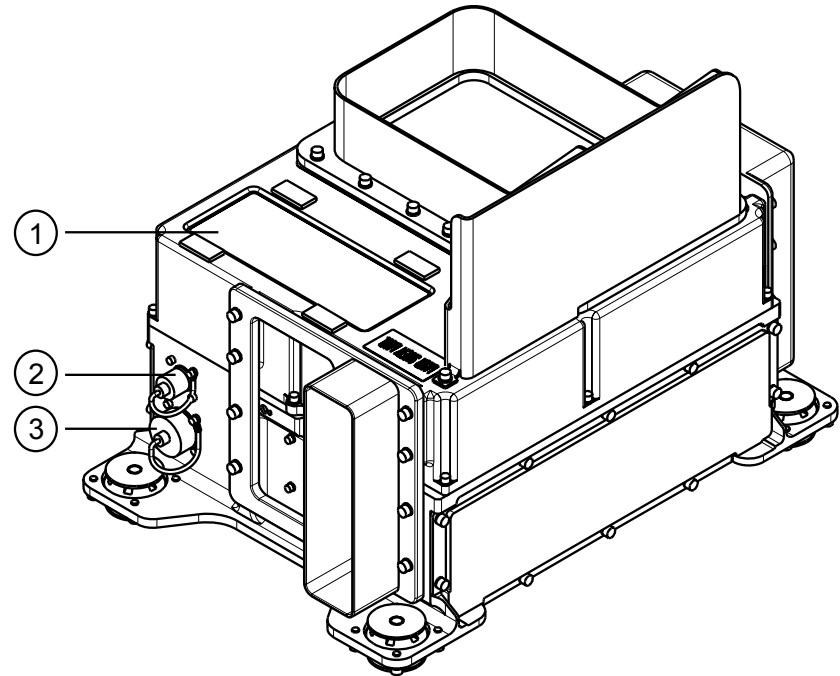
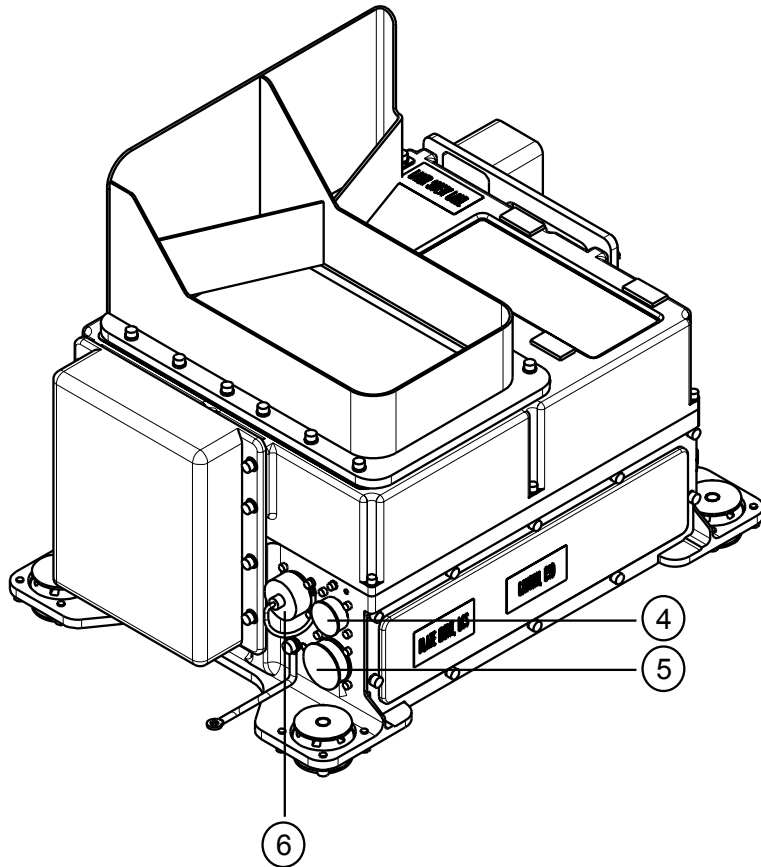
CREW CONTROL:

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)

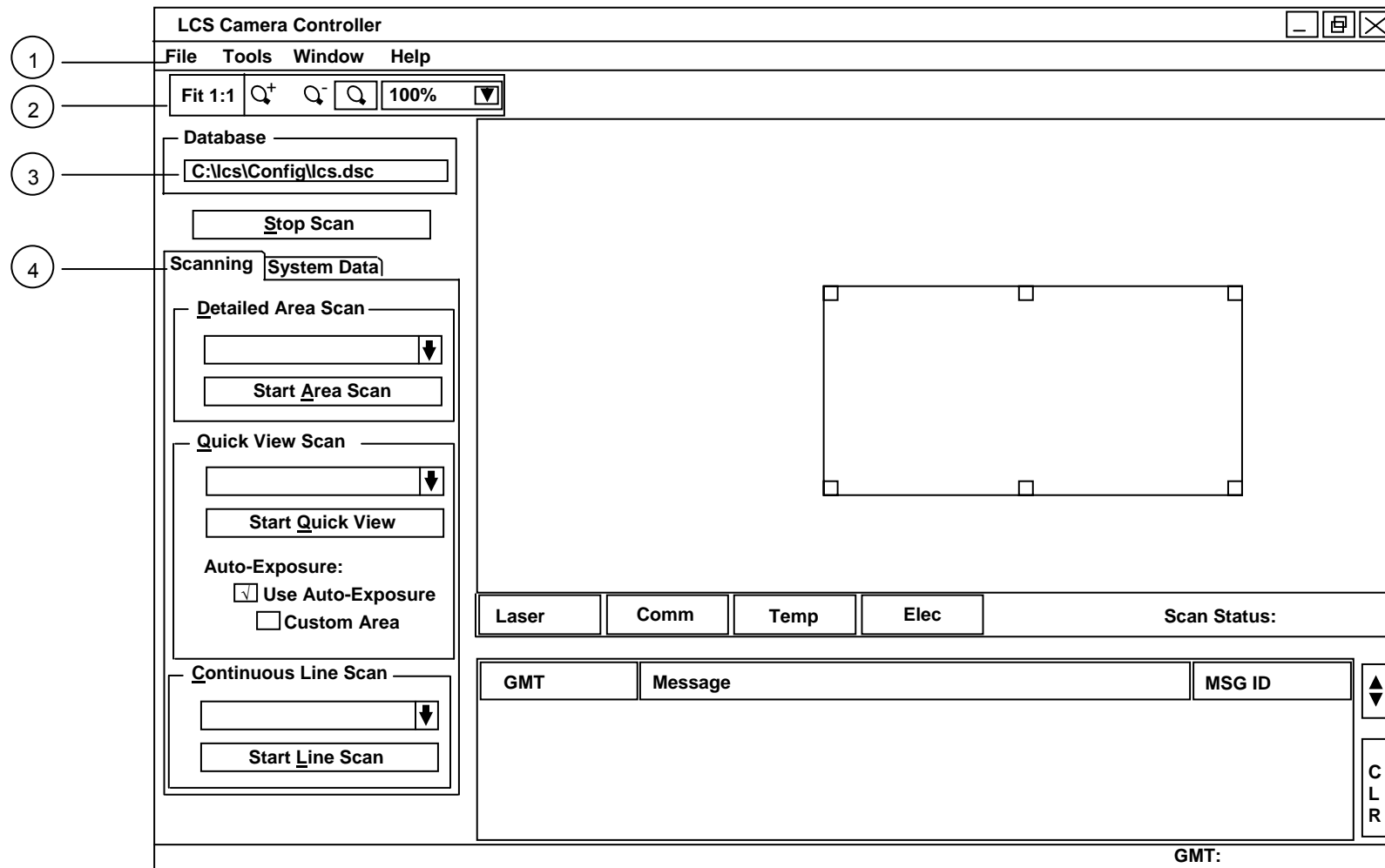
LCS NOMENCLATURE



- 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



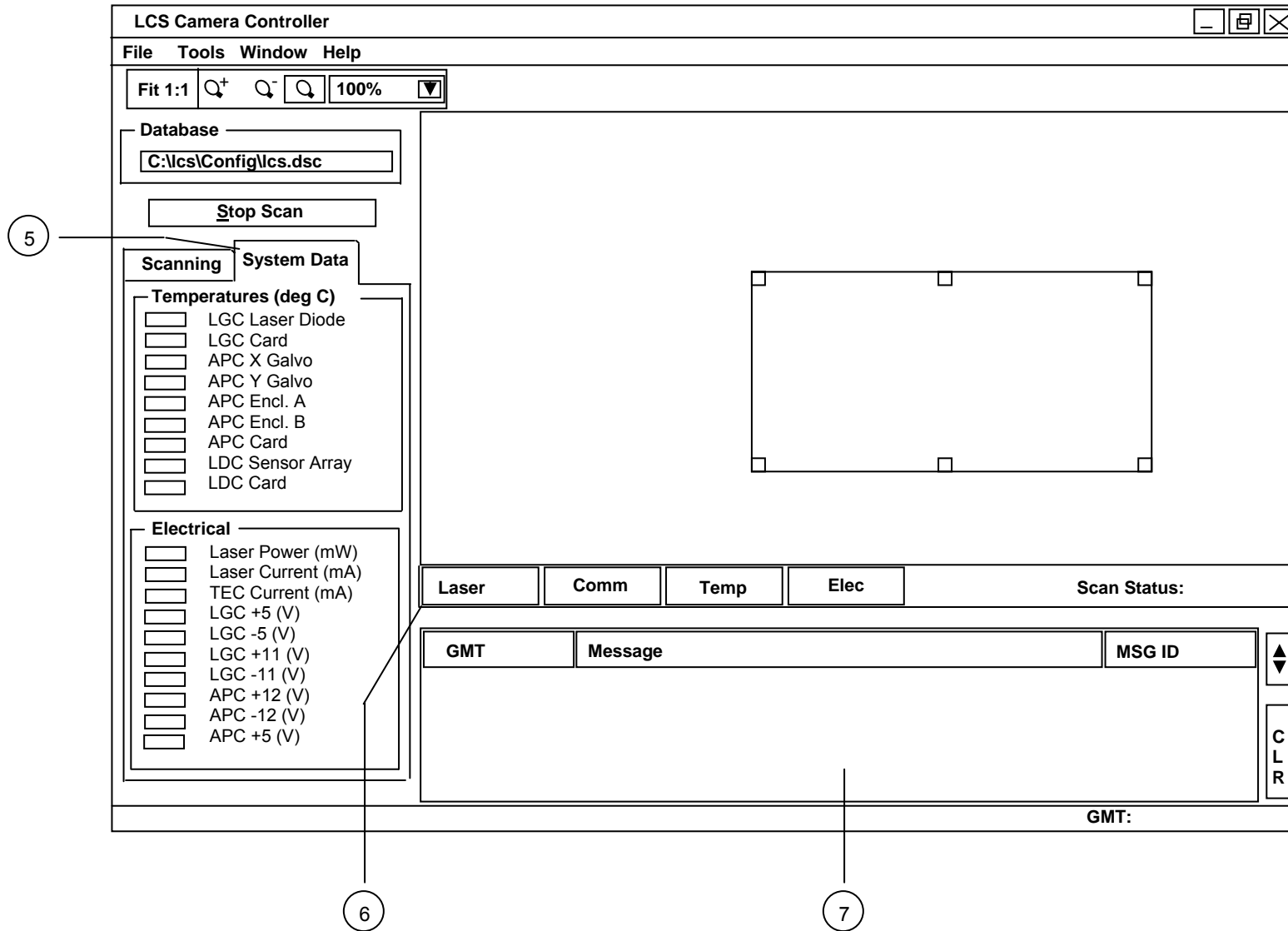
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCC SOFTWARE GUI (Continued)

①	Menu Bar [File, Tools, Help]		
	[File]	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 DIALOGUE BOXES, 21-16
	[Tools]	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 its 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
	[Window] (Menu appears only when scan bin files being viewed)	Status Toolbar	Allows Status Toolbar to be displayed below GUI. Contains only GMT
		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	
[Help]	Arrange Icons	If multiple windows open and minimized in display area, will align minimized files	
	About	Displays window w/software-specific information; i.e., version of release	
②	Zoom Toolbar		
	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	
③	Database	Displays current database and its path. Default is "c:\lcs\config\lcs.doc"	
	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)		
	[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
	[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
	[Auto-Exposure]	Use Auto-Exposure	Enables Auto-Exposure. AE feature adds ~10 sec. Three initial scans taken and exposure calculated based on those scans
		Custom Area	Enables Custom Area Box in image as reqd. Auto-exposure calculated from Custom Area Box
	[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

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 causes a msg to be displayed)	
	[Temperature]	Displays LCH component temp values in deg Celsius
	[Electrical]	Displays LCH component elec values. Values are milliWatts, milliamps, 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
	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
	Comm	Light displays Ethernet communication state between LCC,LCH Green Light – Indicates good Ethernet connection Yellow Light – Indicates bad Ethernet connection
	Temp	
	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	
	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)	
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: Refer to LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (PHOTO/TV FS, REF PROC)

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)

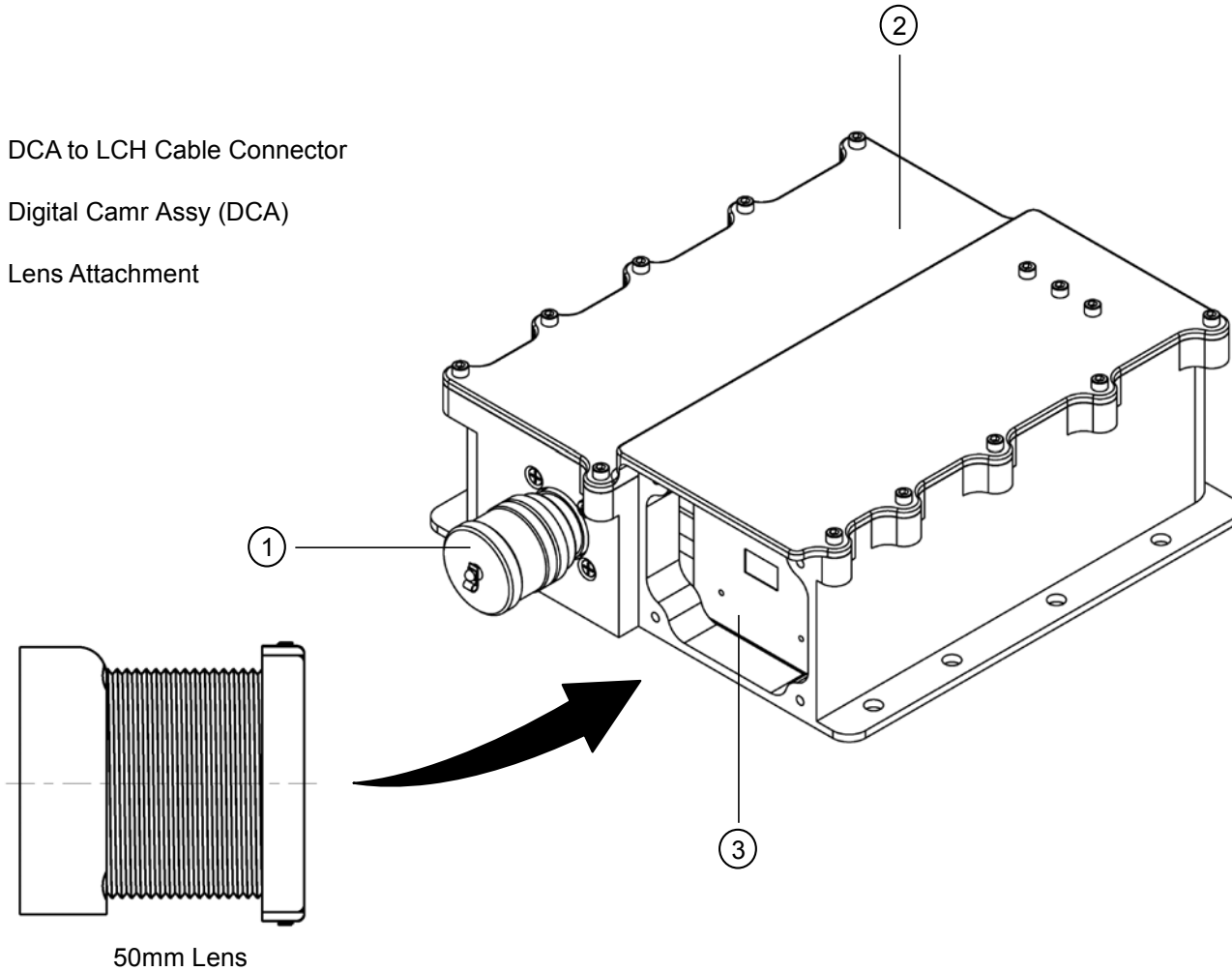
Software – LCC software shortcut (Shuttle Apps\IDC)

IMAGE FORMAT: 16-bit tif

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

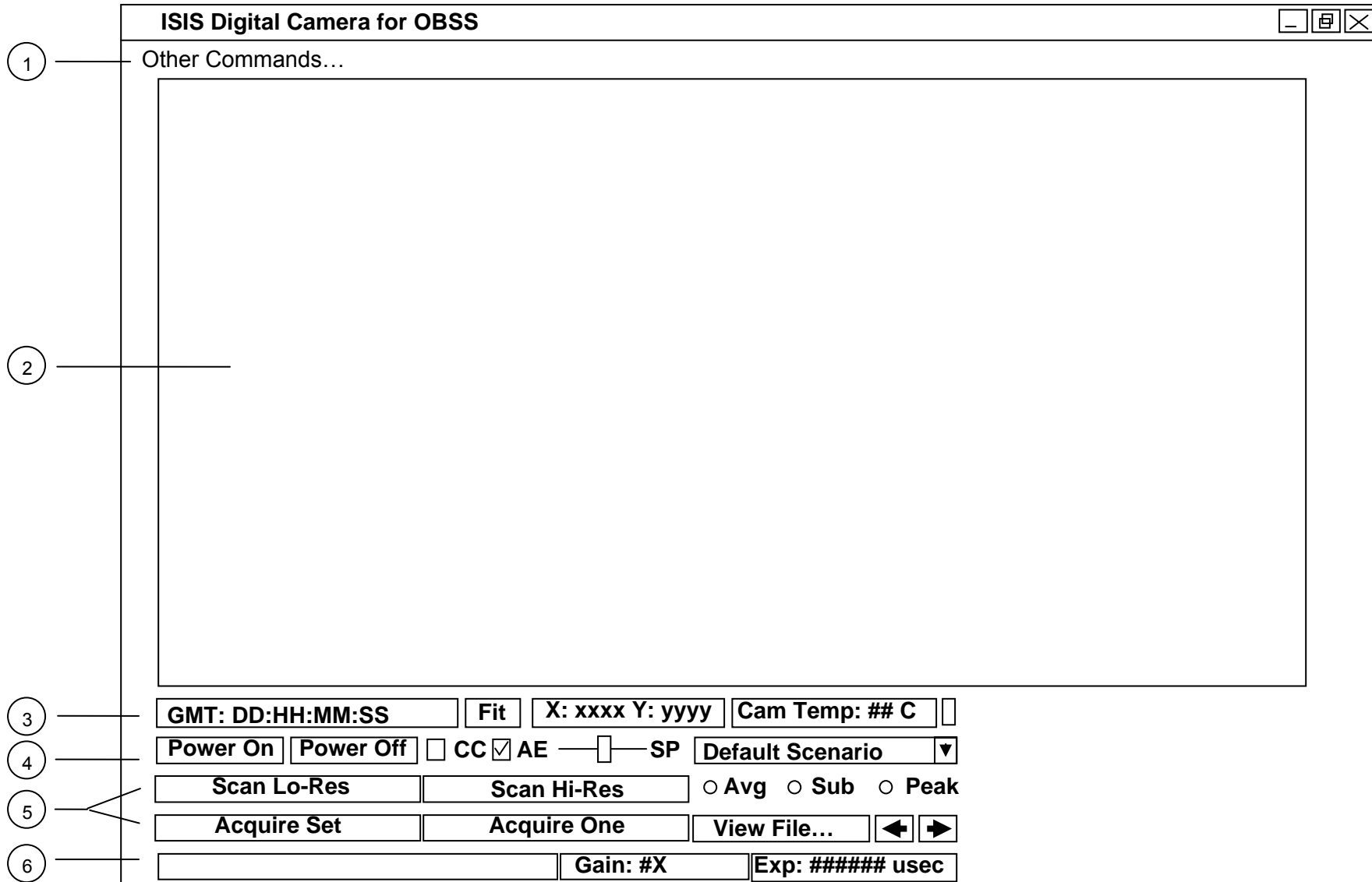
IDC NOMENCLATURE

- ① DCA to LCH Cable Connector
- ② Digital Camr Assy (DCA)
- ③ Lens Attachment



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)	
	Advanced Command	Brings up an Advanced Settings dialog box in which user may apply or see specific setting for individual image acquisition options. See pg 21-12
	[F2]	Brings up "Add Notation" box for adding text to tiff. This text will be added to all tiffs; so, clear it if added to text box
	[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
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
	[CC]	Allows user to color code the over and under exposed areas of image
	[AE]	Allows selection of auto-exposure capability
	AE Setpoint Slide Bar	Allows user to set starting exposure for AE algorithm. Bar can be used when Avg, Sub, and Peak algorithms selected
	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
	Avg	Selects averaging AE algorithm. Exposes based on pixels inside box
	Sub	Selects sub image AE algorithm. Takes two images
Peak	Selects peak AE algorithm. Exposes based on brightest pixels in box	
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	
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

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

IDC SOFTWARE GUI (Continued)

Advanced Settings [X]

Acquire One

Exposure: ##### usec

Gain: #X [v]

Acquire Set

Select Image: # [▲▼]

Exposure: ##### usec

Gain: #X [v]

or Fraction: X

Scan

Select Type:

Lo-Res

Hi-Res

Exposure: ##### usec

Gain: #X [v]

Decimation: ## [▲▼]

Period: X msec

Do Self Test

Black Level: ##

Cancel Reset to Defaults Accept

8

9

10

11

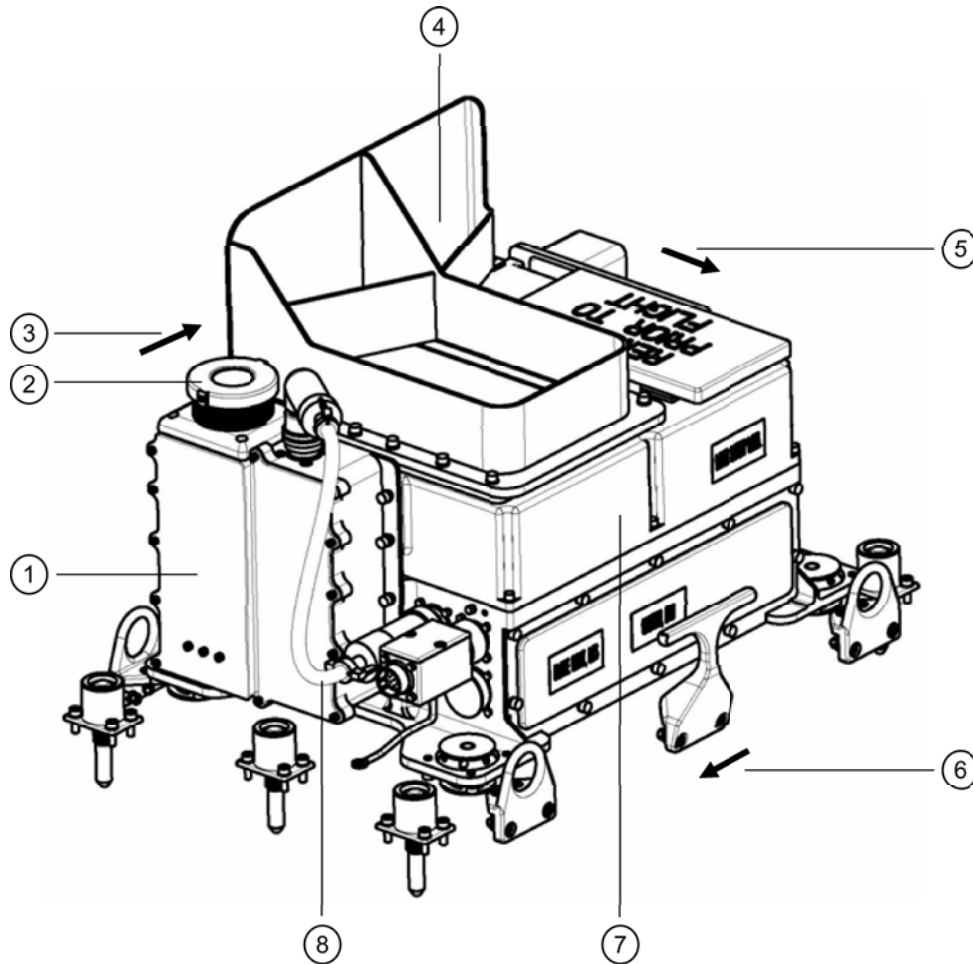
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

IDC SOFTWARE GUI (Concluded)

8	"Acquire One" Settings (Allows user to set exposure and gain settings for "Acquire One" cmd which acquires a single image from Camr)	
	[Exposure]	User may set exposure from 25 usec to 80025 usec
	[Gain]	User may set Gain from 1X to 8X
9	"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)	
	[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
	[or Fraction]	Shows denominator value for exposure value. A "1" is assumed for the numerator
10	"Scan" Settings (Allows user to exposure, gain, and decimation settings for low/high resolution continuous scans)	
	[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
	[Period]	Sets scan period. Allows user to throttle rate of image/file creation for some scan scenarios
11	"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 Camr'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

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

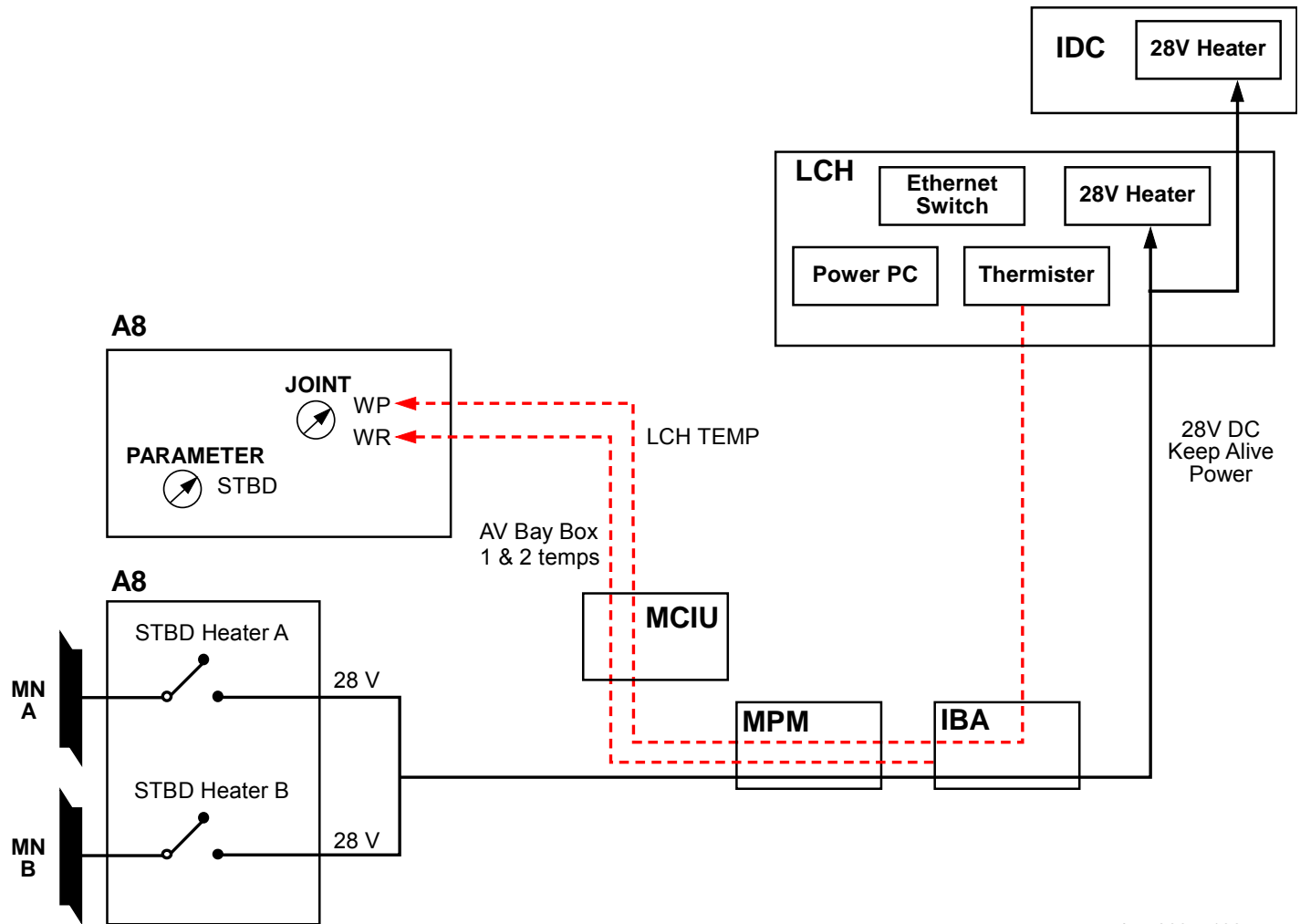
LCS/IDC COMBINED NOMENCLATURE



- 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 (ECA) Cable

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

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

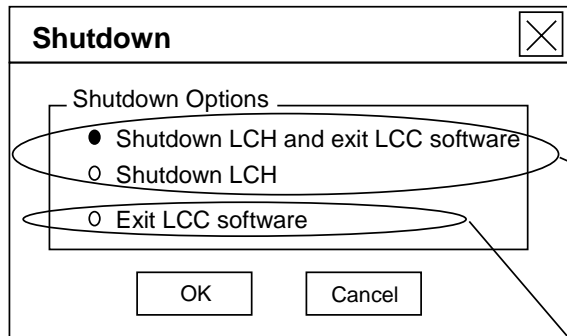


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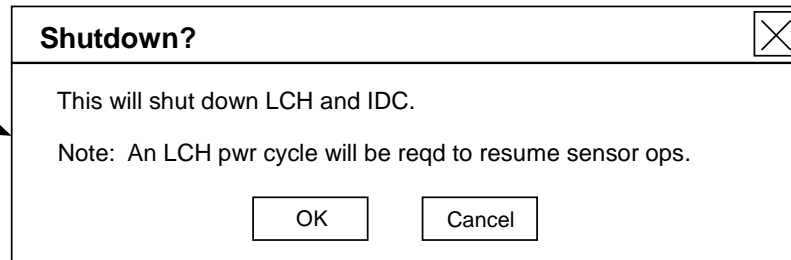
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCC SOFTWARE EXIT DIALOGUE BOXES

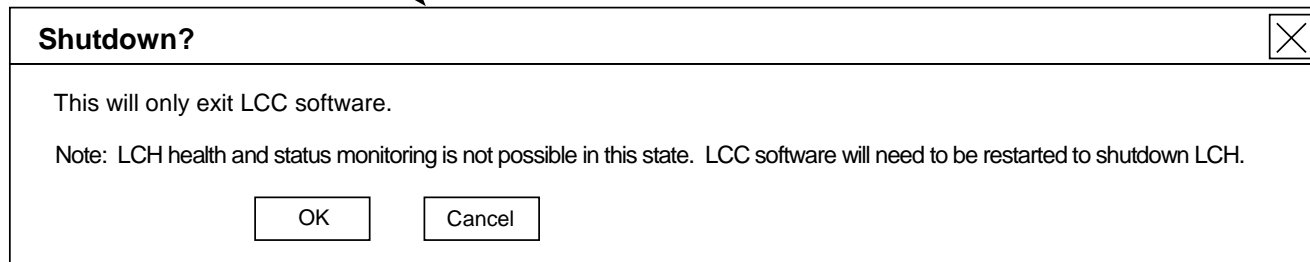
Case 1: Selecting "File" and choosing "Exit" w/green Comm light.



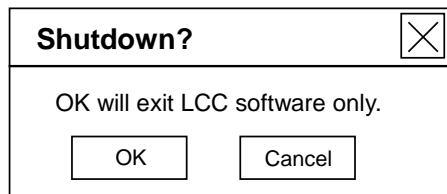
When either "Shutdown LCH and exit LCC software" or "Shutdown LCH" are selected from "Shutdown" dialogue box, following "Shutdown?" dialogue box displayed:



When "Exit LCC software" is selected from "Shutdown" dialogue box, following "Shutdown?" dialogue box displayed:



Case 2: Selecting "File" and choosing "Exit" w/yellow Comm light.



jsc48037_160.cvx

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 pwr'd input, such as AVIU(V10))

- | | |
|---------------|---|
| MO58F
AVIU | 1. ✓Video destination properly configured per LCC ACTIVATION, step 1 (Cue Card, <u>LCS</u>) and pwr'd
✓TV PWR – ON
✓HI-Z/75 – 75 |
| CC | ✓PWR SELECT – LO
PWR – OFF |
| A31p | 2. <u>Desktop</u>
Right click
Sel 'Properties' |
| | 3. <u>'Display Properties' Dialog Box</u>
Sel 'Settings'
✓Screen Area – 1024 x 768
If not 1024 x 768:
Move Screen Area sidebar to 1024 x 768
Sel 'Apply'
When second 'Display Properties' dialog box opens:
Sel 'OK'
When 'Monitor Settings' dialog box opens:
Sel 'Yes' |
| | 4. <u>'Display Properties' Dialog Box</u>
Sel 'Advanced' |
| | 5. <u>'(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box</u>
Sel 'Displays' tab |

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

MANUAL A31p DESKTOP DNLK SETUP (Continued)

6. √'Displays' tab against fig 20-1 cases' circled areas and perform matching case steps below:

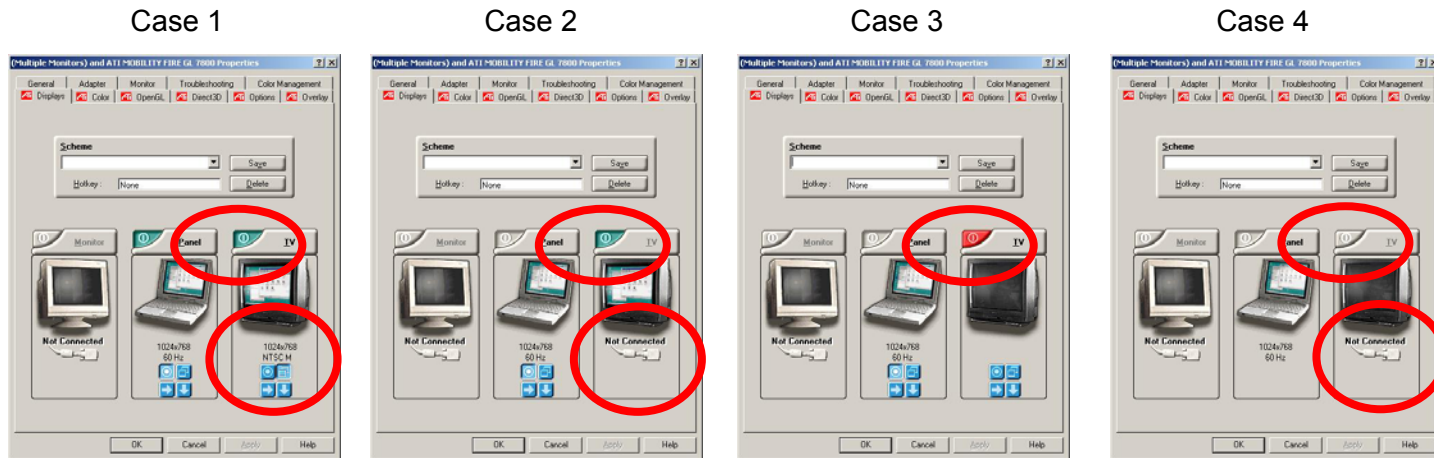


Figure 20-1.- Multiple monitors and ATI mobility fire GL 7800 display tab.

If Case 1 (Video out port enabled and good A31p video to powered AVIU):

Sel 'OK'

If Case 2 (Video signal lost due to bad LCS video cable, adapter, or AVIU setting):

Sel 'OK'

√TV PWR – ON

√LCS Video Cable connected to J1

√LCS Video Adapter connected to A31p Video Out port

Repeat steps 4-6

If Case 3 (Video out port disabled and good LCS video cable connection to powered AVIU):

Click on red button in Case 3 circle

√Display looks like Case 1

Sel 'OK'

When ATI Property Page appears:

Sel 'Yes'

MO58F
AVIU
A31p

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

MANUAL A31p DESKTOP DNLK SETUP (Concluded)

66. (Concluded)

~
|

If Case 4 (Bad LCS video cable, adapter, or connection, AVIU not powered or configured or A31p port problem):

AVIU
A31p

Sel 'OK'

√LCS Video Cable connected to J1

√LCS Video Adapter connected to A31p Video Out port

Repeat steps 4-6

If no longer Case 4:

| Repeat step 6

If still Case 4:

Sel 'OK'

Replace entire LCS Video Cable (including A31p Video Adapter)

Repeat steps 4-6

If no longer Case 4:

| Repeat step 6

If still Case 4:

Sel 'OK'

Replace AVIU

Repeat steps 4-6

If no longer Case 4:

| Repeat step 6

If still Case 4:

Sel 'OK'

Replace A31p

Repeat steps 1-6

If no longer Case 4:

| Repeat step 6

If still Case 4:

√MCC

7. 'Display Properties' Dialog Box

Sel 'OK'

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

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, 20-17 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'
 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 20-1)
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'

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

RECONFIGURATION OF A31p SCREEN RESOLUTION (Concluded)

9. 'Display Properties' Dialog Box
 - Sel 'Settings'
 - Move Screen Area slidebar 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

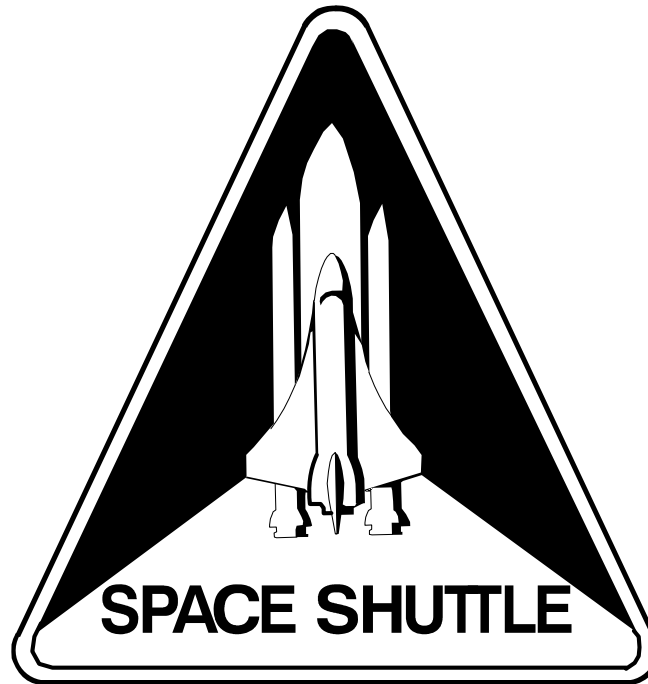
BATT/FUSE REFERENCE..... 21-2

BATTS & FUSES

BATTS & FUSES

BATT/FUSE REFERENCE

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



**PHOTO/TV
CHECKLIST**

**STS
ALL**