Photo/TV Checklist

STS-115

Mission Operations Directorate
Operations Division

Final
July 21, 2006
List of Implemented Change Requests (482s):

P/TV_FSP-0058

Incorporate the following:

1. Replace iii thru viii
2. Replace 1-31 and 1-32, 1-35 and 1-36
3. Replace 4-3 thru 4-22
4. Replace 12-5 and 12-6, 12-9 thru 12-12
5. Replace 15-5 and 15-6
6. Replace CC 23-5 and CC 23-6, CC 23-11 and CC 23-12

Prepared by: [Signature]  
Assistant Mission Lead

Approved by: [Signature]  
Technical Lead, Shuttle Photo/TV Group

Accepted by: [Signature]  
PDF Manager

Endl: 42 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):

P/TV_FSP-0056
P/TV_FSP-0057

Incorporate the following:

1. Replace iii thru viii
2. Replace 1-7 thru 1-10, 1-15 thru 1-18, 1-31 and 1-32, 1-37 and 1-38
3. Replace 5-9 and 5-10
4. Replace 8-1 and 8-2
   After 8-2, add 8-2a and 8-2b
5. Replace 11-1 and 11-2, 11-5 thru 11-8
6. Replace 15-3 and 15-4, 15-7 and 15-8
7. Replace 20-1 and 20-2
8. Replace 21-1 and 21-2, 21-5 and 21-6, 21-17 thru 21-20
   After 21-20, add 21-21 and 21-22
9. Replace CC 23-17 and CC 23-18

Prepared by:  
Paul Kiehnt
Assistant Mission Lead

Approved by:  
Darrell Williams
Technical Lead, Shuttle Photo/TV Group

Accepted by:  
Michael E. Shaw
FDF Manager

Encl: 48 pages

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MISSION OPERATIONS DIRECTORATE

STS-115 PHOTO/TV CHECKLIST

FINAL
July 21, 2006

PREPARED BY:

Paul Reichert
P. Reichert
Assistant Mission Lead

C. Pierce
Publication Manager

APPROVED BY:

D. Williams
Technical Lead, Shuttle Photo/TV Group

Kimberly Johnson
Manager, Shuttle Procedures Management

ACCEPTED BY:

Michael M. Sturan
FDF Manager

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Incorporates the following:

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* Previously implemented in an earlier publication

AREAS OF TECHNICAL RESPONSIBILITY

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# STS-115 PHOTO/TV CHECKLIST

## LIST OF EFFECTIVE PAGES

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* – Omit from flight book

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| 23-21 (4 pgs) | 115/FIN | † 
| 23-22 (4 pgs) | 115/FIN | † 

* – Omit from flight book  
† – Replace with blue K-10 card stock in flight book only
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H/W SUMMARY

- DTV Audio Cable
- MD AVIU
- WVS 1
- WVS 2
- BPSMU to CCU Adapter Cable
- jsc48037_115_010r2
- cvx
- SEC C/L
- LDRI/ITVC
- VIDEO PROCESSING UNIT
- ON OFF CB1
- RSC VIDEO J101 J103 J105 J107 OPP
- R12
- RSC Video Cable
- Digital CC Vid/Pwr Cable (15 ft)
- RCA Barrel Adapter
- WVS TV Pwr Cable (20 ft)
- MD PAO TV Pwr Cable (20 ft)
- WVS TV Pwr Cable (20 ft)
- Digital CC Vid/Pwr Cable (15 ft)
- AVIU-CC Video Cable
- MON 1 TV Pwr Cable (20 ft)
- Digital CC Vid/Pwr Cable (15 ft)
- AVIU-CC Video Cable
- MON 2 TV Pwr Cable (20 ft)
- Digital CC Vid/Pwr Cable (15 ft)
- AVIU-CC Video Cable
- Balanced Video Cable
- PCMCIA to WIB-Remote Cable (6 ft)
- RS-422 PCMCIA Card/Cable Assy
- A/E FD PAO TV Pwr Cable (10 ft)
- A/V Adapter Cable
- Wide Conversion Lens
- Multiuse Arm
- Photoflood (w/Clamp)
- To MON 2 CI N
- Balanced Video Cable Coupler
- SSV BNC to BNC Cable (SED16103248–301)
- SSV to PDIP/CIP Cable (SED16103246–301)
- Balanced/Unbalanced Video
- Video A (PAYLOAD)
- PGSC Pwr Cable (6 ft) (SED39122875–301)
- Pwr PAYLOAD DATA INTERFACE PANEL 2 (L11)
- CABIN P/L J101 J103 J105 J107 DC1 DC2
- Video Spare 1 (Gnd cntl)
- SSV Compression Encoder Box
- SSV TCS
- AVIU Video Cable Assy (12 ft)
- AVIU LCD Cable Assy (20 ft)
- RCA-RCA Video Cable
- A31p Video Adapter
- P/TV01 VIDEO SETUP

P/TV01 VIDEO SETUP
SCENE SYNOPSIS

Scene contains procedures for documenting Video Setup

SETUP

NOTE
Steps 1-5 minimum reqmt for FD2 OBSS TPS inspection

1. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
2. Perform SETUP (DTV)
3. Perform V10 FROM MON 1 (SONY V10)
4. Perform V10 FROM MON 2 (SONY V10)
5. RSC Video Cable connected between R12/OPP-RSC Video and R12/VPU-CCTV PL3
6. Perform ANALOG PAO CC (SONY PD100)
7. Perform IN-CABIN MINI-CAM (MINI-CAM)
8. Perform WVS INITIAL SETUP w/o ERCAs (WVS)
9. Unstow, set up BPSMU w/BPSMU to CCU Adapter Cable at CDR CCU
10. Perform SSV NOMINAL SETUP (SSV)
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**SCENE SYNOPSIS**

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

**QUICK CHECK**

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<td>CC PWR – CAMERA</td>
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<td>L12 (SSP 2) C/L CAM PWR – SEC ON</td>
<td>MON 2 SOURCE – C</td>
</tr>
</tbody>
</table>
P/TV02  DOCK (Continued)

SETUP

1. Perform V10 FROM MON 1 FOR DOCK/UNDOCK (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform CCTV CONFIG FOR DOCKING/UNDOCKING (RNDZ, RNDZ TOOLS)
5. Perform SETUP (DTV)
6. Perform ANALOG PAO CC (SONY PD100)
7. √C/L CAMR INSTALL (CENTERLINE CAMR) performed
8. Perform F5 PROGRAM w/FLASH (NIKON F5)
9. Perform 760 SHUTTER PRIORITY (DCS 760)
10. Perform 760 PROGRAM w/FLASH (DCS 760)
<table>
<thead>
<tr>
<th>√</th>
<th>Item # Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12A-12</td>
<td>PAO COVERAGE</td>
<td>F5</td>
<td>760</td>
<td>As desired PD100 Tape installed LIVE (if avail) Plan for end of day crew choice video,DCS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28-70mm</td>
<td>28-70mm</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>ISO 160 CNeg</td>
<td>if exterior: Flash ON/OFF – OFF</td>
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<td></td>
<td></td>
<td>28-70mm</td>
<td>760 (Shutter)</td>
<td>A(B,C,D),ELB</td>
<td>Map ISS surfaces w/10% overlap</td>
</tr>
<tr>
<td></td>
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<td>400mm(180mm)</td>
<td>400mm(180mm)</td>
<td>As desired PD100</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Flash ON/OFF – OFF</td>
<td>Flash ON/OFF – OFF</td>
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<td></td>
<td></td>
<td></td>
<td>A(D)</td>
<td>PD100</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>C(B) Docking view</td>
<td>As desired PD100</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>C/L Per RNDZ</td>
<td></td>
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<td></td>
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<td>Per RNDZ</td>
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<tr>
<td>2</td>
<td>12A-5</td>
<td>RENDEZVOUS</td>
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<td>Overall</td>
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<td></td>
<td></td>
<td>Closeup</td>
<td></td>
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<td>Damage</td>
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<td>Deterioration</td>
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<td>3</td>
<td>12A-6</td>
<td>DOCK</td>
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<td></td>
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<td>Docking Targets</td>
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<tr>
<td></td>
<td></td>
<td>Mating Surfaces</td>
<td></td>
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<td></td>
<td>Planar, Hemispherical</td>
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<td>Retroreflector</td>
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</tr>
</tbody>
</table>
P/TV02  DOCK (Continued)

OPS (Continued)

APPROACH/Docking RQMTS

Mapping of ISS Module Surfaces  
DCS 760 Camr w/400mm Lens (Shutter)

PMA2 APDS Area  
DCS 760 Camr w/180mm Lens (Shutter)

C/L Camr

C/rd A(D)

C/rd C(B)

NOTE  
Spot metering when ISS modules < 1/2 frame

Docking View

MON 1 & Repeater PGSC

Range Ruler

MON 2

jsc48037_115_095r1.cvx
P/TV02   DOCK (Concluded)

OPS (Concluded)

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

DEACTIVATION

1. 35mm F5
   √Flash ON/OFF – ON

2. DCS 760
   Pwr – OFF
   Flash ON/OFF – ON
   Start batt recharge as reqd

3. TV System
   R12 (VPU)  
   √Green Jumper – SEC C/L
   √SEC C/L Cap installed
   √VPU PWR – ON (LED on)
   A7
   VID OUT MON 1 pb – push
   IN PL2(VPU) pb – push
   CAMR CMD IRIS – CL
   L12 (SSP 2)
   √C/L CAM PWR – OFF

ODS
Remove, stow C/L Camr, Harness Assy, Bridge
Go to DEACTIVATION (Cue Card, TV) as reqd
This Page Intentionally Blank
P/TV03  UNDOCK (Continued)

SCENE SYNOPSIS

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

QUICK CHECK

<table>
<thead>
<tr>
<th>V10 (two)</th>
<th>PAO CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>O19</td>
<td>O19</td>
</tr>
<tr>
<td>R12 (VPU)</td>
<td></td>
</tr>
<tr>
<td>V10</td>
<td></td>
</tr>
<tr>
<td>PWR – ON</td>
<td>PWR – ON</td>
</tr>
<tr>
<td>Tape – Install</td>
<td>CAMR</td>
</tr>
<tr>
<td>DISPLAY pb – Toggle to display tape counter</td>
<td>Viewfinder (LCD) displays STBY</td>
</tr>
<tr>
<td></td>
<td>Camr Settings</td>
</tr>
<tr>
<td></td>
<td>AUTO LOCK – AUTO LOCK</td>
</tr>
<tr>
<td></td>
<td>FOCUS – AUTO</td>
</tr>
<tr>
<td></td>
<td>F1(MO52J)</td>
</tr>
<tr>
<td></td>
<td>AC UTIL PWR AC1 – ON</td>
</tr>
<tr>
<td></td>
<td>Photoflood</td>
</tr>
<tr>
<td></td>
<td>ON/OFF – ON</td>
</tr>
<tr>
<td></td>
<td>Photo/Camr</td>
</tr>
<tr>
<td></td>
<td>Scene composition, focus</td>
</tr>
<tr>
<td></td>
<td>C/L Camr</td>
</tr>
<tr>
<td>C/L Camr</td>
<td>DTV</td>
</tr>
<tr>
<td>R12 (VPU)</td>
<td>L10 (MUX)</td>
</tr>
<tr>
<td>L10 (MUX)</td>
<td>VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td></td>
<td>If dnlk, MUX/VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td></td>
<td>(VIP) PWR – on (LED on)</td>
</tr>
<tr>
<td></td>
<td>(VTR) ON/STBY LED – green</td>
</tr>
<tr>
<td>L12 (SSP 2)</td>
<td>MON 2</td>
</tr>
<tr>
<td>C/L Camr PWR – SEC ON</td>
<td>SOURCE – C</td>
</tr>
</tbody>
</table>
P/TV3 UNDOCK (Continued)

**SETUP**

1. Perform V10 FROM MON 1 FOR DOCK/UNDOCK (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform CCTV CONFIG FOR DOCKING/UNDOCKING (RNDZ, RNDZ TOOLS)
5. Zero PTU Angles (If not previously set up by MCC)
   
   Perform ILLUMINATOR OPS (Cue Card, TV) for ELB Camr
   
   VID OUT MON 1(2) pb – push
   IN RMS pb – push
   CAMR CMD ZOOM – Full zoom out
   PAN,TILT – Center Wrist Base in FOV per dwg at right
   ZOOM – Full zoom in
   CAMR CMD PAN/TILT – LO RATE
   CAMR CMD PAN,TILT – Refine placement of Wrist Base in FOV per dwg at right
   CAMR CMD PAN/TILT – RESET

   If Daylight Undock:
   
   Perform ILLUMINATOR OPS (Cue Card, TV) for Camr C
   
   VID OUT MON 1(2) pb – push
   IN C pb – push
   CAMR CMD ZOOM – Full zoom out
   PAN,TILT – Center Camr D in FOV
   ZOOM – Full zoom in
   PAN/TILT – LO RATE
   PAN,TILT – Refine placement of Camr D in FOV
   PAN/TILT – RESET

6. Perform SETUP (DTV)
7. Perform ANALOG PAO CC (SONY PD100)
8. √C/L CAMR INSTALL (CENTERLINE CAMR), steps 1,2
9. Perform F5 PROGRAM w/FLASH (NIKON F5)
10. Perform F5 SHUTTER PRIORITY (DCS 760)
11. Perform 760 PROGRAM w/FLASH (DCS 760)
## P/TV03 UNDOCK (Continued)

### OPS

<table>
<thead>
<tr>
<th>Item #</th>
<th>Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>35mm</td>
<td>DCS</td>
<td>PLB</td>
</tr>
<tr>
<td>1.</td>
<td>12A-12</td>
<td>PAO COVERAGE</td>
<td>F5 28-70mm ISO 160 CNeg If exterior: Flash ON/OFF – OFF</td>
<td>760 28-70mm If exterior: Flash ON/OFF – OFF</td>
<td>As desired</td>
</tr>
<tr>
<td>2.</td>
<td>12A-8 12A-9</td>
<td>UNDOCK AND FLYAROUND</td>
<td>• Docking Target  • Mating Surfaces  • Planar Retroreflector  • Surfaces  • Solar Panels  • Handrails  • SVS Targets  • MISSE  • SM Thrusters  • S0,S1,P1,P6 Truss  • Trusses including rads/baseplates and SAWs (In/Outbd SABB insulation degradation) • Plasma arching on amodized surfaces in velocity vector</td>
<td>760 (Shutter) 180mm (400mm) Flash ON/OFF – OFF</td>
<td>A(D) Per RNDZ C/L Docking tgt &amp; PAO view</td>
</tr>
</tbody>
</table>
## P/TV03 UNDOCK (Continued)

### OPS (Continued)

<table>
<thead>
<tr>
<th>√</th>
<th>Item # Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
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<tbody>
<tr>
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<td></td>
<td>35mm DCS</td>
<td>PLB</td>
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<tr>
<td>3.</td>
<td>12A-7</td>
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<td></td>
<td></td>
<td></td>
<td>P6 Solar Array and SRMS/OBSS Motion During Undock</td>
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<td></td>
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<td></td>
<td></td>
<td>ELB Illuminator on</td>
<td>Gnd will set up Camr view if Ku avail</td>
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<td></td>
<td></td>
<td>ELB</td>
<td>Begin recording at least 5 min prior to undock</td>
</tr>
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<td></td>
<td></td>
<td>PAN: -70.0°</td>
<td>During undock, do not adjust Camr pan(tilt). Allow P6 SAW to leave FOV</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TILT: -4.0°</td>
<td>Record until undock + 8 min. When SAW leaves FOV, recording no longer needed</td>
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<td></td>
<td>FOV: 9.7°</td>
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<td>Actual FOV:</td>
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<td>• Frame FOV as shown</td>
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<td></td>
<td>• Focus on SVS targets</td>
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<td></td>
<td></td>
<td>If Daylight undock:</td>
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<td>PAN: 44.8°</td>
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<td>TILT: 22.5°</td>
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<td>FOV: 12.1°</td>
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<td>Actual FOV:</td>
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<td>• Frame FOV as shown</td>
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<td>• Focus on end of Truss</td>
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<td></td>
<td>• Stbd SAW tip will be in center of FOV ~3 min after undock</td>
<td></td>
</tr>
</tbody>
</table>
UNDOCKING/FLYAROUND RQMTS

PMA2 APDS Area

Mapping of ISS Module Surfaces

C/L Camr

Camr ELB

Camr C

Camr A(D) (flyaround at 400 ft)

Note: Spot metering when ISS modules < 1/2 frame

DCS 760 Camr w/180mm Lens (Shutter)

DCS 760 Camr w/400mm Lens (Shutter)

MON 1 & Repeater PGSC

DTV

MON 2

(At 400 ft only)
P/TV03  UNDOCK (Concluded)

OPS (Concluded)

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

DEACTIVATION

1. 35mm F5
   - Flash ON/OFF – ON

2. DCS 760
   - Pwr – OFF
   - Flash ON/OFF – ON
   - Start batt recharge as reqd

3. TV System
   - R12 (VPU)
     - Green Jumper – SEC C/L
     - SEC C/L Cap installed
     - VPU PWR – ON (LED on)
   - A7
     - VID OUT MON 1 pb – push
     - IN PL2(VPU) pb – push
   - L12 (SSP 2)
     - C/L CAM PWR – OFF

ODS
   - Remove, stow C/L Camr, Harness Assy
   - Mark first MON 2 tape as “P3/P4 During Undock”
   - Go to DEACTIVATION (Cue Card, TV) as reqd
P/TV04 INGRESS/EGRESS

H/W SUMMARY

INGRESS TV CONFIG

[Diagram of INGRESS TV CONFIG]

Batt

Wide Conversion Lens

A/L

BPSMU to CCU Adapter Cable

CCU 1

CC

A/V

(R12)

BPSMU

VIDEO PROCESSING UNIT

Wireless Video System Interface Box

CCTV PL3

1-24

P/TV115/FIN
P/TV04  INGRESS/EGRESS (Continued)

SCENE SYNOPSIS

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

QUICK CHECK

<table>
<thead>
<tr>
<th>INGRESS CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
</tr>
<tr>
<td>Batt installed</td>
</tr>
<tr>
<td>PWR – CAMERA</td>
</tr>
<tr>
<td>Tape – Install</td>
</tr>
<tr>
<td>Viewfinder (LCD) displays STBY</td>
</tr>
<tr>
<td>Camr Settings</td>
</tr>
<tr>
<td>AUTO LOCK – AUTO LOCK</td>
</tr>
<tr>
<td>FOCUS – AUTO</td>
</tr>
<tr>
<td>Scene composition,focus</td>
</tr>
<tr>
<td>R12 (VPU)</td>
</tr>
<tr>
<td>Green Jumper – ISS</td>
</tr>
<tr>
<td>VPU PWR – ON (LED on)</td>
</tr>
</tbody>
</table>

SETUP

1. **Config ISS Video**
   Perform ACTIVATION (Cue Card, TV) for DNLK OPS of ISS signal
   
   R12 (VPU)
   Green Jumper – ISS
   VPU pwr – ON (LED on)
   A7
   VID OUT DNLK pb – push
   IN PL2(VPU) pb – push

2. **Perform Handheld CC SETUP**
   
   A17
   Acquire two batts, one for CC and one spare
   CC
   Batt Install
   PWR – CAMERA
   Tape – Install
   Viewfinder (LCD) displays STBY
   Camr Settings
   AUTO LOCK – AUTO LOCK
   FOCUS – AUTO
   Audio Muting Plug removed
P/TV04 INGRESS/EGRESS (Concluded)

SETUP (Concluded)

3. Relocate BPSMU w/BPSMU to CCU Adapter Cable to A/L CCU 1
4. Perform F5 PROGRAM w/FLASH (NIKON F5)
5. Perform 760 PROGRAM w/FLASH (DCS 760)

OPS

<table>
<thead>
<tr>
<th>✓</th>
<th>Item # Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hatch Opening/Closing, Ingress/Egress</td>
<td>F5</td>
<td>760</td>
<td>PD100</td>
</tr>
<tr>
<td></td>
<td>12A-12</td>
<td>28mm</td>
<td>28-70mm</td>
<td>PLB</td>
<td></td>
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<tr>
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<td>ISO 160</td>
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<td>CC</td>
<td>LIVE</td>
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<td></td>
<td></td>
<td>DnK</td>
<td>(if avail)</td>
</tr>
</tbody>
</table>

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

DEACTIVATION

**WARNING**
When photo/TV cables not in continuous use, disconnect all QDs except BPSMU and restrain cable ends at hatches to prevent cable impairment to hatch closure

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

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

SETUP

WARNING

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

1. √BPSMU AUDIO ONLY (BPSMU) completed

2. For PAO Live Dnlk Event:
   - Green Jumper – ISS
   - VPU PWR – ON (LED on)
   - Perform ACTIVATION, OPERATION (Cue Card, TV) for DNLK OPS of ISS CC via PL2(VPU)

3. Relocate BPSMU w/BPSMU to CCU Adapter Cable to CDR CCU, PLT CCU (two)

4. Perform F5 PROGRAM w/FLASH (NIKON F5)

5. Perform 760 PROGRAM w/FLASH (DCS 760)
<table>
<thead>
<tr>
<th>Item #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12A-12</td>
<td>GENERAL ISS IVA ACTIVITY</td>
<td>F5 28mm ISO 160 Cneg</td>
<td>760 28-70mm</td>
<td>ISS PD100</td>
</tr>
<tr>
<td></td>
<td>• PAO Scenes of Interest</td>
<td>For Crew Photo: Perform F5 CREW PHOTO (SETUP, NIKON F5)</td>
<td>For Crew Photo: Perform 760 CREW PHOTO (SETUP, DCS 760)</td>
<td>LIVE (if avail)</td>
</tr>
<tr>
<td></td>
<td>• Crew Photo</td>
<td></td>
<td></td>
<td>Plan for end of day crew choice video, DCS</td>
</tr>
</tbody>
</table>

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

DEACTIVATION

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

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

### QUICK CHECK

<table>
<thead>
<tr>
<th>V10 (two)</th>
<th>PAO CC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>O19</strong></td>
<td><strong>O19</strong></td>
</tr>
<tr>
<td>√ TV Pwr – ON</td>
<td>√ TV Pwr – ON</td>
</tr>
<tr>
<td><strong>R12 (VPU)</strong></td>
<td><strong>CC</strong></td>
</tr>
<tr>
<td>√ VPU PWR – ON (LED on)</td>
<td>PWR – CAMERA</td>
</tr>
<tr>
<td><strong>V10</strong></td>
<td><strong>Tape – Install</strong></td>
</tr>
<tr>
<td>PWR – ON</td>
<td>Tape – Install</td>
</tr>
<tr>
<td>Tape – Install</td>
<td>√ Viewfinder (LCD) displays STBY</td>
</tr>
<tr>
<td>DISPLAY pb – Toggle to display tape counter</td>
<td>Camr Settings</td>
</tr>
<tr>
<td></td>
<td>√ AUTO LOCK – AUTO LOCK</td>
</tr>
<tr>
<td></td>
<td>√ FOCUS – AUTO</td>
</tr>
<tr>
<td><strong>F1(MO52J)</strong></td>
<td><strong>AC UTIL PWR AC1 – ON</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Photoflood ON/OFF – ON</strong></td>
</tr>
<tr>
<td></td>
<td><strong>CC</strong></td>
</tr>
<tr>
<td></td>
<td>√ Scene composition, focus</td>
</tr>
<tr>
<td><strong>RSC Camr</strong></td>
<td><strong>DTV</strong></td>
</tr>
<tr>
<td><strong>R12 (OBSS)</strong></td>
<td><strong>L10 (MUX)</strong></td>
</tr>
<tr>
<td>√ RSC PWR – ON</td>
<td>√ VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td>√ RSC Video Cable connected between R12/OPP-RSC Video and R12/VPU-CCTV PL 3</td>
<td>If dnlk, MUX/VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td></td>
<td><strong>PWR – on (LED on)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>VIP</strong></td>
</tr>
<tr>
<td></td>
<td><strong>VTR</strong></td>
</tr>
<tr>
<td></td>
<td>√ VTR/ON/STBY LED – green</td>
</tr>
<tr>
<td></td>
<td>√ Tape installed</td>
</tr>
<tr>
<td></td>
<td><strong>MON 2</strong></td>
</tr>
<tr>
<td></td>
<td>SOURCE – C</td>
</tr>
</tbody>
</table>
P/TV06  P3/P4 INSTALLATION (Continued)

**SETUP**

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION,OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. **Config RSC Camr, ISS**
   - RSC Video Cable connected to WIB PL3 per dwg at right
   - OBSS SW PWR – cl
   - OBSS SW PWR – ON
   - RSC PWR – ON
   - Green Jumper – ISS
   - VPU PWR – ON (LED on)
6. Perform ANALOG PAO CC (SONY PD100)
7. Perform RWS V10 FROM MON 1 (SONY V10)
8. Perform RWS V10 FROM DTV (SONY V10)
9. BPSMU w/BPSMU to CCU Adapter Cable connected to CDR CCU
# P/TV06 P3/P4 INSTALLATION (Concluded)

## OPS

<table>
<thead>
<tr>
<th>Item # Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>35mm</strong></td>
<td><strong>DCS</strong></td>
<td><strong>PLB</strong></td>
</tr>
<tr>
<td>12A-13</td>
<td>P3/P4 Unberth/Mnvr</td>
<td></td>
<td></td>
<td>Per SODF: RBT FS</td>
</tr>
<tr>
<td></td>
<td>• Release of P3/P4 attach points</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SRMS pre-grapple posn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12A-14</td>
<td>P3/P4 Installation</td>
<td></td>
<td></td>
<td>Per SODF: RBT FS</td>
</tr>
<tr>
<td></td>
<td>• P3/P4 Installation to installed P1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Handoff SRMS to SSRMS</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

## DEACTIVATION

1. **TV System**
   - Go to DEACTIVATION (Cue Card, **TV**) as reqd
**SCENE SYNOPSIS**

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

**QUICK CHECK**

<table>
<thead>
<tr>
<th>Shuttle V10 (four)</th>
<th>PAO CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>O19,MO58F</td>
<td>O19</td>
</tr>
<tr>
<td>TV Pwr – ON</td>
<td>TV Pwr – ON</td>
</tr>
<tr>
<td>R12 (VPU)</td>
<td>CC</td>
</tr>
<tr>
<td>VPU PWR – ON (LED on)</td>
<td>PWR – CAMERA</td>
</tr>
<tr>
<td>V10</td>
<td>Tape – Install</td>
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<tr>
<td>PWR – ON</td>
<td>Viewfinder (LCD) displays STBY</td>
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<td>Tape – Install</td>
<td>Camr Settings</td>
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<td>DISPLAY pb – Toggle to display tape counter</td>
<td>AUTO LOCK – AUTO LOCK</td>
</tr>
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<td></td>
<td>FOCUS – AUTO</td>
</tr>
<tr>
<td>F1(MO52J)</td>
<td>F1(MO52J)</td>
</tr>
<tr>
<td>Photoflood</td>
<td>AC UTIL PWR AC1 – ON</td>
</tr>
<tr>
<td>CC</td>
<td>ON/OFF – ON</td>
</tr>
<tr>
<td></td>
<td>Scene composition, focus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DTV</th>
<th>WVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>L10 (MUX)</td>
<td>A7</td>
</tr>
<tr>
<td>VTR/CC PWR – on (LED on)</td>
<td>WIRELESS VID HTR – ON</td>
</tr>
<tr>
<td>(VIP)</td>
<td></td>
</tr>
<tr>
<td>PWR – on (LED on)</td>
<td></td>
</tr>
<tr>
<td>(VTR)</td>
<td></td>
</tr>
<tr>
<td>ON/STBY LED – green</td>
<td></td>
</tr>
<tr>
<td>Tape installed</td>
<td></td>
</tr>
<tr>
<td>MON 2</td>
<td>SOURCE – C</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>


SETUP

1. Perform V10 FROM MON 1 (SONY V10)
2. Perform V10 FROM MON 2 (SONY V10)
3. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. Perform ANALOG PAO CC (SONY PD100) for PAO CC (O19)
6. Perform RWS V10 FROM DTV (SONY V10)
7. Perform RWS V10 FROM MON 1 (SONY V10)
8. Config WVS and PGSC
   WVS INITIAL SETUP w/o ERCAs (WVS), steps 1,2 performed
   Perform WVS DAY-OF-EVA CHECK (WVS)
9. Perform F5 PROGRAM w/FLASH (NIKON F5)
10. 760 EVA – CAMR ONLY performed (DCS 760 EVA)
11. Perform 760 PROGRAM w/FLASH (DCS 760)
P/TV07 EVA (Continued)

SETUP (Concluded)

12. Config ISS Video  
R12 (VPU)  
Green Jumper – ISS  
√VPU PWR – ON (LED on)

13. For EVA 3, Config LDRI/ITVC Video (as reqd)  
R12 (VPU)  
Green Jumper – LDRI/ITVC  
√VPU PWR – ON (LED on)  
(OPP) cb OBSS SW PWR – cl  
√OBSS SW PWR – ON  
(OBSS) √SPEE PWR – ON  
ITVC ENA - ON

A7  
VID OUT MON 1(2) pb – push  
IN PL2(VPU) pb – PUSH  
If MAN GAIN pb not illuminated:  
R12 (OBSS)  
ITVC ENA – OFF, wait 10 sec, ON  
Repeat until MAN GAIN illuminated

A7  
LT LEVEL pb – push  
DAY(NIGHT) pb – push  
ALC pb – push  
AVG pb – push

MON 1(2)  
√ITVC Video displayed

OPS

<table>
<thead>
<tr>
<th>Item #</th>
<th>Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>12A-12</td>
<td>PAO Coverage</td>
<td>F5 28-70mm ISO 160 CNeg</td>
<td>IVA 760 28-70mm</td>
<td>As desired</td>
</tr>
<tr>
<td>Item #</td>
<td>Track #</td>
<td>Rqmts</td>
<td>Still Imagery</td>
<td>Video</td>
<td>Notes</td>
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<tr>
<td>2.</td>
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<td>✓</td>
<td></td>
<td>WVS</td>
<td>LIVE</td>
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<tr>
<td>12A-15</td>
<td></td>
<td></td>
<td>35mm</td>
<td></td>
<td></td>
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<tr>
<td>12A-20</td>
<td></td>
<td></td>
<td>DCS</td>
<td></td>
<td>(if avail)</td>
</tr>
</tbody>
</table>

Obtain Video of the Following Tasks:
- Connect P3 to P1 upper tray utilities
- Close CID S0-4B
- Release upper, lower SAAB-to-IEA Restraints
- Rotate P4 keel pin
- Release upper, lower Beta gimbal restraints and SABBs
- Verify 4-bar locking strut assembly trigger cups/latches properly engaged after 4-bar deploy
- Confirm both SABBs fully unlatched and all seven BRS pins for each blanket released
- Deploy SARJ DLAs
- Connect P3 to P1 lower tray utilities
- Close CID S0-2B
- Swing open MLI cover latch assemblies on covers (spring clamp bolts)
- Imagery of each port SARJ DLA after DLA commanded to “engaged” posn and prior to MLI re-install
- Remove SARJ launch restraints
- Remove SARJ launch locks
- Imagery of each port SARJ trundle bearing and surrounding race ring area after launch lock removal
- Remove, stow P3 keel pin and drag link

<table>
<thead>
<tr>
<th>Track #</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>12A-15</td>
<td></td>
<td></td>
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<tr>
<td>12A-20</td>
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</tbody>
</table>

LIVE (if avail)
Still Imagery Video

<table>
<thead>
<tr>
<th>Item # Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>35mm</td>
<td>DCS</td>
<td>PLB</td>
</tr>
<tr>
<td>2. 12A-15 12A-20</td>
<td>Obtain Video of the Following Tasks: (Concluded)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Release PV radiator cinches</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>• Rigidize P3/P4 AJIS struts</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Deploy P3 SARJ brace beams</td>
<td></td>
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<tr>
<td></td>
<td>• Install MT temp rail stop</td>
<td></td>
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<td></td>
<td>• Rotate P1,P3 MT stop</td>
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<tr>
<td></td>
<td>• Rotate tether shuttle stop</td>
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<tr>
<td></td>
<td>• Remove P3 SVS Target (P3-E8) from Face 1</td>
<td></td>
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<tr>
<td></td>
<td>• Release P4 PVR winch</td>
<td></td>
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<tr>
<td></td>
<td>• R&amp;R stbd S-Band BSP and transponder</td>
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<tr>
<td></td>
<td>• CID 6,8 removal</td>
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<tr>
<td></td>
<td>• Activities associated w/EVA Get-Ahead items</td>
<td></td>
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<tr>
<td></td>
<td>• Remove P3 RPDA Covers</td>
<td></td>
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<tr>
<td></td>
<td>• Perform CMG RPCM R&amp;R</td>
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<td></td>
<td>• Perform CMG RPCM patch pnl reconfig</td>
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<tr>
<td></td>
<td>• Retrieve MISSE 5</td>
<td></td>
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<tr>
<td></td>
<td>• Engage P6 BGA Hinge Lock</td>
<td></td>
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<tr>
<td></td>
<td>• P6 BGA Shoulder Bolt Retainer Install (x8)</td>
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<tr>
<td></td>
<td>• Install EWIS antennas,cable on U.S. Lab</td>
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<tr>
<td></td>
<td>• Release P4 IEA MMOD Shield Bolt torques</td>
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<tr>
<td></td>
<td>• Realign rails by adjusting SARJ launch restraints</td>
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<tr>
<td></td>
<td>• EWIS External antennas</td>
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</tbody>
</table>

2. 12A-15 12A-20

WVS LIVE (if avail)

EVA DCS 760 images preferred; WVS secondary
P/TV07  EVA (Concluded)

OPS (Concluded)

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

DEACTIVATION

1. 35mm F5
   \Flash ON/OFF – ON

2. EVA DCS 760
   If between EVAs, perform 760 EVA – CAMR ONLY DISASSEMBLY, BETWEEN EVAs (DCS 760 EVA)
   If EVAs completed, perform 760 EVA – CAMR ONLY DISASSEMBLY, POST-EVA (DCS 760 EVA)

3. IVA DCS 760
   Pwr – OFF
   \Flash ON/OFF – ON
   Download images
   Start batt recharge as reqd

4. TV System
   Perform PWRDN (Cue Card, WVS)
   Go to DEACTIVATION (Cue Card, TV) as reqd
SCENE SYNOPSIS

Scene contains procedures for documenting ISS external structures w/still photos

SETUP

1. **760 Camr Configuration**
   - if Sunlit OMS Pod Survey, config 760 Manual
     - Pwr – ON
     - √Disk installed
     - Rear LCD
     - √Batt
     - √Frames remaining sufficient
     - √White Balance – Flash
     - √ISO – 100
     - √BKT – Disabled
     - √Focus Area – Center, LOCK displayed
     - Exp Comp – 0.0
     - Exp Mode – M
     - SS – 1000
     - AF Area Mode – [ ] (no “+”)
     - Meter – Matrix
     - Dioptr – Adjust
     - Film Adv – S
     - Body Focus Mode – S
     - Lens Focus Mode – A(M/A)
     - Aperture – Min, locked
     - f/stop – F8
     - Flash Settings
       - ON/OFF – OFF
P/TV08  EXTERNAL SURVEY (Continued)

SETUP (Concluded)

1. 760 Camr Configuration (Concluded)

    If Earthshine OMS Pod Survey, config 760 Program
    Pwr – ON
    √Disk installed
    Rear LCD
    √Batt
    √Frames remaining sufficient
    √White Balance – Flash
    √ISO – 100
    √BKT – Disabled
    √Focus Area – Center, LOCK displayed
    Exp Comp – 0.0
    Exp Mode – P
    AF Area Mode – [ ] (no “+”)
    Meter – Spot
    Diopter – Adjust
    Film Adv – S
    Body Focus Mode – S
    Lens Focus Mode – A(M/A)
    Aperture – Min, locked
    Flash Settings
      ON/OFF – OFF

2. Perform F5 SHUTTER PRIORITY (NIKON F5)

3. Perform 760 SHUTTER PRIORITY (DCS 760)
### OPS

<table>
<thead>
<tr>
<th>√</th>
<th>Item #</th>
<th>Track #</th>
<th>Rqmts</th>
<th>Still Imagery</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
</table>
|   | 1.     |         | OMS Pod Survey  
|   |        |         | • 50 percent mapping of both OMS pods and vertical stabilizer w/emphasis on Black Tile areas | 760 180mm(400mm) |       | Download images to OMS POD folder on KFX once complete |
|   | 2.     | 12A-21  | P3/P4 Visual Inspection  
|   |        |         | • All exposed sides  
|   |        |         | • Closeups of:  
|   |        |         | – P3 mating H/W  
|   |        |         | – Thermal blankets  
<p>|   |        |         | – SVS targets | 760 50mm(180mm) | A,B,C,D,ELB | PD100 |</p>
<table>
<thead>
<tr>
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<th>Video</th>
<th>Notes</th>
</tr>
</thead>
</table>
- Surfaces  
- Solar Panels  
- Handrails  
- SVS Targets  
- ESP2  
- MISSE  
- Plasma Arcing on ISS Anodized Surfaces in Velocity Vector  
- SM Thrusters -zenith side  
- Trusses including rads/baseplates, SAWs (in/outbd SABB insulation degradation) | F5 50mm (180mm) ISO 100 CPos  
F5 50mm (180mm) ISO 100 CPos  
F5 50mm (180mm) ISO 100 CPos  
F5 50mm (180mm) ISO 100 CPos | 760 50mm(180mm) | A,B,C,D,RMS | Map ISS surfaces w/10% overlap |
Priority of ISS Photographic Targets During Docked Phase:

1. P3/P4, P1, ESP2, Joint Airlock, MISSE 5, S1, Solar Arrays – W1, W6 (special emphasis on newly installed components)
2. P6, S0, Lab – W7, W8
3. PMA2 – W9, W10
4. SVS Targets – All windows
5. P6 Fwd Radiator – Fwd windows
P/TV08  EXTERNAL SURVEY (Concluded)

OPS (Concluded)

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

DEACTIVATION

1. 35mm F5
   Exp Mode – P
   Flash ON/OFF – ON

2. DCS 760
   Exp Mode – P
   PWR – OFF
   Flash ON/OFF – ON
   Start Batt recharge as reqd
SCENE SYNOPSIS

Scene contains procedures for recording P4 SAW, PVR Deploys

QUICK CHECK

<table>
<thead>
<tr>
<th>V10 (two)</th>
<th>DTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>O19</td>
<td>V10 (MUX)</td>
</tr>
<tr>
<td>TV Pwr – ON</td>
<td>VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td>R12 (VPU)</td>
<td>(VIP)</td>
</tr>
<tr>
<td>VPU Pwr – ON (LED on)</td>
<td>PWR – on (LED on)</td>
</tr>
<tr>
<td>V10</td>
<td>(VTR)</td>
</tr>
<tr>
<td>PWR – ON</td>
<td>ON/STBY LED – green</td>
</tr>
<tr>
<td>Tape – Install</td>
<td>Tape installed</td>
</tr>
<tr>
<td>DISPLAY pb – Toggle to display tape counter</td>
<td>MON 2</td>
</tr>
<tr>
<td></td>
<td>SOURCE – C</td>
</tr>
</tbody>
</table>

PAO CC

<table>
<thead>
<tr>
<th>O19</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV Pwr – ON</td>
<td>Remove Wide Conversion Lens</td>
</tr>
<tr>
<td></td>
<td>PWR – CAMERA</td>
</tr>
<tr>
<td></td>
<td>Tape – Install</td>
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<td></td>
<td>Viewfinder (LCD) displays STBY</td>
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<tr>
<td></td>
<td>Camr Settings</td>
</tr>
<tr>
<td></td>
<td>AUTO LOCK – AUTO LOCK</td>
</tr>
<tr>
<td></td>
<td>FOCUS – INFINITY</td>
</tr>
<tr>
<td></td>
<td>Scene composition, exposure, focus</td>
</tr>
</tbody>
</table>
P/TV09  SAW/PVR DEPLOY (Continued)

SETUP

1. Perform V10 From MON 1 (SONY V10)
2. Perform V10 From MON 2 (SONY V10)
3. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. Perform ANALOG PAO CC (SONY PD100), but remove Wide Conversion Lens
6. Config VPU Green Jumper – ISS
7. Perform 760 SHUTTER PRIORITY (DCS 760)

OPS

<table>
<thead>
<tr>
<th>Item #</th>
<th>Track #</th>
<th>Still Imagery</th>
<th>Video</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>35mm</td>
<td>DCS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>760 (IVA) Lens as reqd</td>
<td>A,B,ELB,ISS Camrs per SODF: RBT FS</td>
</tr>
</tbody>
</table>

If OPS temporarily suspended, perform DEACTIVATION as reqd
If OPS completed, go to DEACTIVATION
P/TV09  SAW/PVR DEPLOY (Concluded)

DEACTIVATION

1. **PAO CC**
   Re-install Wide Conversion Lens

2. **TV System**
   Label tapes as “SAW(PVR) DEPLOY”
   Go to DEACTIVATION (Cue Card, TV) as reqd
This Page Intentionally Blank
P/TV10  REBOOST (Continued)

SCENE SYNOPSIS

Scene contains procedures for recording P4 SAW, P4 TCS Radiator motion during reboost

QUICK CHECK

<table>
<thead>
<tr>
<th>V10 (two)</th>
<th>DTV</th>
</tr>
</thead>
<tbody>
<tr>
<td>O19</td>
<td>L10 (MUX)</td>
</tr>
<tr>
<td>✓TV Pwr – ON</td>
<td>✓VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td>R12 (VPU)</td>
<td>If dnlk, MUX/VTR/CC PWR – on (LED on)</td>
</tr>
<tr>
<td>✓VPU Pwr – ON (LED on)</td>
<td>(VIP)</td>
</tr>
<tr>
<td>V10</td>
<td>(VTR)</td>
</tr>
<tr>
<td>PWR – ON</td>
<td>✓ON/STBY LED – green</td>
</tr>
<tr>
<td>Tape – Install</td>
<td>✓Tape installed</td>
</tr>
<tr>
<td>DISPLAY pb – Toggle to display tape counter</td>
<td>MON 2</td>
</tr>
<tr>
<td></td>
<td>SOURCE – C</td>
</tr>
</tbody>
</table>

PAO CC

| O19                        |                                         |
| CC                         |                                         |
| ✓TV Pwr – ON               |                                         |
| Remove Wide Conversion Lens|                                         |
| PWR – CAMERA               |                                         |
| Tape – Install             |                                         |
| ✓Viewfinder (LCD) displays STBY |                                         |
| Camr Settings              |                                         |
| ✓AUTO LOCK – AUTO LOCK     |                                         |
| FOCUS – INFINITY           |                                         |
| ✓Scene composition, exposure, focus |                                         |
P/TV10 REBOOST (Continued)

SETUP

1. Perform V10 From MON 1 (SONY V10)
2. Perform V10 From MON 2 (SONY V10)
3. Perform ACTIVATION, OPERATION (Cue Card, TV) as reqd
4. Perform SETUP (DTV)
5. Perform ANALOG PAO CC (SONY PD100), but remove Wide Conversion Lens
6. Config VPU Green Jumper – ISS
### P/TV10 REBOOST (Continued)

#### OPS

<table>
<thead>
<tr>
<th>√</th>
<th>Item #</th>
<th>Rqmts</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 1. | 12A-18 | REBOOST  
- Movement of P4 SAWs TCS Radiators | | |
| 2. | Camr FOV Setup Prior to Test  
- Frame per values but use pictures for final pan,tilt  
- Pan/tilt settings approx and assume zeroed, PTU angles  
- √A,B,C Illuminators – On | | Frame as shown. Focus on P1 radiator tip |
| | | | | |
| | | | A | PAN: 107.8°  
TILT: 64.5°  
FOV: 16.0° ± 0.5°  
Actual FOV: ________ |
| | | | B | PAN: -30.8°  
TILT: 47.1°  
FOV: 16.0° ± 0.5°  
Actual FOV: ________ |
| | | | C | PAN: -36.7°  
TILT: 44.9°  
FOV: 16.0° ± 0.5°  
Actual FOV: ________ |
P/TV10  REBOOST (Continued)

**OPS (Continued)**

<table>
<thead>
<tr>
<th>√</th>
<th>Item #</th>
<th>Rqmts</th>
<th>Video</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>To maintain Time sync, once video recorders started, do not stop tape until test completed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Start Recorders (three)</td>
<td>V10 (two) REC pb (two) – push to begin recording LCD displays RED DOT L10 (VTR) REC pb – push, hold PLAY pb – push, SIMO (RED dot displayed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Route FD CC Video to Recorders (three) and Downlink</td>
<td>VID OUT MON 1 pb – push IN FLT DECK pb – push Frame GMT clock in FD CC FOV using MON 1 VID OUT MON 2 pb – push IN FLT DECK pb – push GMT clock on MON 2 DTV view of FD CC GMT clock on V10 LCD (two) VID OUT DNLK pb – push IN FLT DECK pb – push</td>
<td>Rcd at least 10 sec of GMT clock video onto each device</td>
<td>Dnlk GMT clock, if comm</td>
</tr>
<tr>
<td>5.</td>
<td>Route Views to Recorders (three) and Downlink</td>
<td>VID OUT MON 1 pb – push IN A pb – push VID OUT MON 2 pb – push IN B pb – push VID OUT DTV pb – push IN C pb – push VID OUT DNLK pb – push IN A pb – push</td>
<td>Rcd views for 35 min or until end of event Gnd may switch dnlk view during test</td>
<td>Dnlk view if comm</td>
</tr>
<tr>
<td>6.</td>
<td>Re-route FD CC Video to Recorders (three) and Downlink Before Tape Ends</td>
<td>VID OUT MON 1 pb – push IN MIDDECK pb – push Frame GMT clock in FD CC FOV using MON 1 VID OUT MON 2 pb – push IN FLT DECK pb – push GMT clock on MON 2 DTV view of FD CC GMT clock on V10 LCD (two) VID OUT DNLK pb – push IN FLT DECK pb – push</td>
<td>Rcd at least 10 sec of GMT clock video onto each device</td>
<td>Dnlk GMT clock, if comm</td>
</tr>
</tbody>
</table>
P/TV10  REBOOST (Concluded)

OPS (Concluded)

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

DEACTIVATION

1. PAO CC
   Re-install Wide Conversion Lens

2. TV System
   Label tapes as “REBOOST”
   Go to DEACTIVATION (Cue Card, TV) as reqd
NIKON F5

SETUP

F5 PROGRAM w/FLASH

Camr Settings
  Pwr – ON
  [ ] Batt icon full
  Frame Counter ≥1
  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
  [ ] ISO – DX
  [ ] Camr BKT – Disabled
  [ ] Focus Area – Center, LOCK displayed

Data Back Settings
  [ ] Between Frame – YR MO/DY HR:MIN SEC
  [ ] Between Frame Data – PRINT displayed

Flash Settings
  ON/OFF – ON
  [ ] Mode – TTL, Matrix
  [ ] Zoom – Auto (No M)
  Tilt – Direct

F5 SHUTTER PRIORITY

Camr Settings
  Pwr – ON
  [ ] Batt icon full
  Frame Counter ≥1
  Exp Comp – 0.0
  Exp Mode – S
  SS – 500
  AF Area Mode – [ ] (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
  [ ] ISO – DX
  [ ] Camr BKT – Disabled
  Focus Area – Center, LOCK displayed

Data Back Settings
  [ ] Between Frame – YR MO/DY HR:MIN SEC
  [ ] Between Frame Data – PRINT displayed

Flash Settings
  ON/OFF – OFF
NIKON F5 (Continued)

SETUP (Continued)

F5 SHUTTER PRIORITY w/AUTO-BRACKETING

Camr Settings
- Pwr – ON
- √Batt icon full
- √Frame Counter ≥1
- Exp Comp – 0.0
- Exp Mode – S
- SS – 500
- AF Area Mode – [ ] (no “+”) Meter – Matrix
- Diopter – Adjust
- Film Adv – CH
- Body Focus Mode – S
- Lens Focus Mode – A (M/A)
- Aperture – Min, locked
- √ISO – DX
- Camr BKT – BKT, 3F 1.0 displayed
- Focus Area – Center, LOCK displayed

Data Back Settings
- √Between Frame – YR MO/DY HR:MIN SEC
- √Between Frame Data – PRINT displayed

Flash Settings
- ON/OFF – OFF

F5 EVA CAMR

1. Unstow H/W and assemble:
   - Lens – EVA 28mm(EVA 35mm,EVA 50mm)
   - Film ISO 100 CNeg
   - EVA Finder
   - AA Fresh Batts (8) for Camr Body

   Unstow, but do not install:
   - Thermal Cover
   - EVA Camr Mount

2. Camr Settings:
   - Pwr – ON
   - √Batt icon full
   - √Frame Counter ≥1
   - Exp Comp – 0.0
   - Exp Mode – P
   - AF Area Mode – [ ] (no “+”) Meter – Matrix
   - Film Adv – S
   - Body Focus Mode – S
   - Aperture – Min, Locked
   - √ISO – DX
   - Camr BKT – Disabled
   - Focus Area – Center, LOCK displayed
   - Custom Setting – 12-1, E35 (√12-1 displayed)
   - √Vert Shooting Shutter Rel sw – lock (L to white line)

   Data Back Settings:
   - √Between Frame – YR MO/DY HH:MM:SS set to GMT
   - Between Frame Data – PRINT displayed

3. Final Assembly and Test Fire:
   - √All cntl pnl covers closed
   - √Exp Mode – P (no *)
   - Thermal Cover – Install
   - Test fire Camr
   - EVA Camr Mount – Install
   - Temp stow Camr until airlock config for EVA
### NIKON F5 (Continued)

#### SETUP (Continued)

**F5 CREW PHOTO**

- **Lens** – 28mm
- **Film** – ISO 160 CNeg
- **Cnr Settings**
  - **Pwr** – ON
  - √ **Batt icon full**
  - √ **Frame Counter ≥1**
  - **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 – F8
  - √ **ISO** – DX
  - √ **Cnr BKT** – Disabled
  - √ **Focus Area** – Center, LOCK displayed
- **Data Back Settings**
  - Between Frame – TIME, F
  - √ Between Frame Data – PRINT displayed
- **Flash Settings**
  - ON/OFF – ON
  - √ **Mode** – TTL, Matrix
  - √ **Zoom** – Auto (No M)
  - **Tilt** – Direct
- **Remote Release** – Install
- **Multiuse Brkt (Clamp)**
- **Focus**
- **Body Focus Mode** – M
- **Frame, Fire**

---

**F5 EXPOSURE MATCH**

- **Lens** – 28mm
- **Film** – ISO 160 CNeg
- **Cnr Settings**
  - **Pwr** – ON
  - √ **Batt icon full**
  - √ **Frame Counter ≥1**
  - **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
  - √ **ISO** – DX
  - √ **Cnr BKT** – Disabled
  - √ **Focus Area** – Center, LOCK displayed
  - √ **CSM** – 21-1, AEL
- **Data Back Settings**
  - Between Frame – TIME, F
  - √ Between Frame Data – PRINT displayed
- **Flash Settings**
  - ON/OFF – ON
  - √ **Mode** – TTL, Matrix
  - √ **Zoom** – Auto (No M)
  - **Tilt** – Direct

### TECHNIQUE

1. Fill FOV w/Sunlit subject
2. Activate Cnr
3. Exposure Lock pb – Depress and hold
   - Expect values such as 250, F11
4. Focus, Frame, Fire
NIKON F5 (Continued)

SETUP (Continued)

F5 AURORA/AIRGLOW

- Lens – 50mm
- Film – ISO 800 CNeg
- Camr Settings
  - Pwr – ON
  - Batt icon full
  - Frame Counter ≥1
  - Exp Comp – 0.0
  - Exp Mode – M
  - SS – 2 s
  - AF Area Mode – [ ] (no “+”)
  - Meter – Matrix
  - Diopter – Adjust
  - Film Adv – C
  - Body Focus Mode – M
  - Aperture – Min, locked
  - f/stop – F1.4
- ISO – DX
  - Camr BKT – BKT, 3F 1.0 displayed
  - Focus Area – Center, LOCK displayed
  - CSM – 17-0, 10A
- Data Back Settings
  - Between Frame – YR MO/DY HR:MIN SEC
  - Between Frame Data – PRINT displayed
- Flash Settings
  - ON/OFF – OFF
  - Remote Release – Install
  - Multiuse Brkt (Clamp)
  - Focus, Frame, Fire, hold for 3 frames

TECHNIQUE

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

F5 CITY LIGHTS/STARS

- Lens – 50mm
- Film – ISO 800 CNeg
- Camr Settings
  - Pwr – ON
  - Batt icon full
  - Frame Counter ≥1
  - Exp Comp – 0.0
  - Exp Mode – M
  - SS – 4
  - AF Area Mode – [ ] (no “+”)
  - Meter – Matrix
  - Diopter – Adjust
  - Film Adv – C
  - Body Focus Mode – M
  - Aperture – Min, locked
  - f/stop – F1.4
- ISO – DX
  - Camr BKT – BKT, 3F 1.0 displayed
  - Focus Area – Center, LOCK displayed
  - CSM – 17-0, 10A
- Data Back Settings
  - Between Frame – YR MO/DY HR:MIN SEC
  - Between Frame Data – PRINT displayed
- Flash Settings
  - ON/OFF – OFF
  - Remote Release – Install
  - Multiuse Brkt (Clamp)
  - Focus, Frame, Fire, hold for 3 frames

TECHNIQUE

1. Dim Cabin lights
2. Use Witches Hat or dark clothing to shield window
NIKON F5 (Continued)

SETUP (Continued)

F5 LIGHTNING

Lens – 50mm
Film – ISO 400 CNeg
Camr Settings
  Pwr – ON
  \Batt icon full
  \Frame Counter ≥1
  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
ISO – DX
Camr BKT – Disabled
Focus Area – Center, LOCK displayed
Data Back Settings
  \Between Frame – YR MO/DY HR:MIN SEC
  \Between Frame Data – PRINT displayed
Flash Settings
  ON/OFF – OFF
Remote Release – Install
Multiuse Brkt (Clamp)
Focus, Frame, Fire

TECHNIQUE
Fire Camr repeatedly. Luck reqd

F5 MOON

Lens – as reqd
Film – ISO 400 CNeg
Camr Settings
  Pwr – ON
  \Batt icon full
  \Frame Counter ≥1
  Exp Comp – 0.0
  Exp Mode – M
  SS – 500
AF Area Mode – [ ] (no “+”)
Meter – Matrix
Diopter – Adjust
Film Adv – CH
Body Focus Mode – S
Lens Focus Mode – M
Aperture – Min, locked
  f/stop – F16
ISO – DX
Camr BKT – Disabled
Focus Area – Center, LOCK displayed
CSM – 17-1, 01A
Data Back Settings
  \Between Frame – TIME, F
  \Between Frame Data – PRINT displayed
Auto Brkt – ON, 0.0 CENTER, 1.0 STEP, 5 FRAME
Flash Settings
  ON/OFF – OFF
Multiuse Brkt (Clamp)
Focus, Frame, Fire, hold for 5 frames
NIKON F5 (Continued)

SETUP (Continued)

**F5 SILHOUETTE**

- **Lens** – 50mm
- **Film** – ISO 160 CNeg
- **Camr Settings**
  - **Pwr** – ON
  - □ Batt icon full
  - □ Frame Counter ≥1
  - **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
  - □ ISO – DX
  - □ Camr BKT – Disabled
  - □ Focus Area – Center, LOCK displayed
  - □ CSM – 21-1, AEL
- **Data Back Settings**
  - Between Frame – TIME, F
  - □ Between Frame Data – PRINT displayed
- **Flash Settings**
  - ON/OFF – OFF

**TECHNIQUE**

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

**F5 SUNRISE/SUNSET**

- **Lens** – 400mm
- **Film** – ISO 400 CNeg
- **Camr Settings**
  - **Pwr** – ON
  - □ Batt icon full
  - □ Frame Counter ≥1
  - **Exp Comp** – 0.0
  - **Exp Mode** – P
  - **AF Area Mode** – [ ] (no “+”)
  - **Meter** – Matrix
  - **Diopter** – Adjust
  - **Film Adv** – C
  - **Body Focus Mode** – S
  - **Lens Focus Mode** – M
  - **Aperture** – Min, locked
  - □ ISO – DX
  - □ Camr BKT – Disabled
  - □ Focus Area – Center, LOCK displayed
  - □ CSM – 21-1, AEL
- **Data Back Settings**
  - Between Frame – TIME, F
  - □ Between Frame Data – PRINT displayed
  - AutoBrkt – ON, 0.0 CENTER, 1.0 STEP, 5 FRAME
- **Flash Settings**
  - ON/OFF – OFF
  - Focus, Frame, Fire, hold for 5 frames

**WARNING**

Do not look at Sun
NIKON F5 (Continued)

SETUP (Concluded)

**F5 SUN STAR EFFECT**
- Lens – 16mm
- Film – ISO 400 CNeg
- Camr Settings
  - Pwr – ON
  - √Batt icon full
  - √Frame Counter ≥1
  - 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
  - √ISO – DX
  - √Camr BKT – Disabled
  - √Focus Area – Center, LOCK displayed
- Data Back Settings
  - √Between Frame – YR MO/DY HR:MIN SEC
  - √Between Frame Data – PRINT displayed
- Flash Settings
  - ON/OFF – OFF
  - Focus, Frame, Fire

**TECHNIQUE**
- Place Sun w/Earth, orbiter, crewmember, etc, in FOV
NIKON F5 (Continued)

SPECIFICATIONS

CAMR BODY
  FILM WIDTH: 35mm
  FILM IMAGE SIZE: 24mm x 36mm
  FILM LOAD: 36 exposures per roll
  EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual
  METER PATTERN: 3D Color Matrix, Center Weighted, Spot
  EXPOSURE COMP: ±5 stops in 1/3 EV stop increments
  SHUTTER:
    Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)
    Manual & Shutter Priority – 1/8000 thru 30 sec (1/3 stop increments) and Bulb (manual only)
  ISO Setting:
    DX – 25-5000
    Manual – 6-6400 in 1/3 stop increments
  FILM ADVANCE SPEED:
    Single
    Continuous – C_l (3 fps), C_h (7 fps), C_s (1 fps)
  BATT: 8 AA
  BATT VOLTAGE: 12V
  BATT LIFETIME: ~2000 exposures/55 rolls
  FUSE: None
  BODY WEIGHT: w/o batts – 2.67 lb

FLASH
  BATT: 4 AA
  BATT LIFETIME: ~4-6 rolls, 36 exp
  WEIGHT: w/o batts – 0.85 lb
## LENS DATA

<table>
<thead>
<tr>
<th>Lens</th>
<th>Aperture Range (f/stop)</th>
<th>Approximate Field of View (FOV)</th>
<th>Approx Minimum Focus Distance (ft)</th>
<th>Weight (lb)</th>
<th>Filter Size</th>
<th>M-A Switch</th>
<th>EVA Certified</th>
</tr>
</thead>
<tbody>
<tr>
<td>16mm AF</td>
<td>f/2.8-f/22</td>
<td>150°-100°-180°</td>
<td>1.0</td>
<td>0.69</td>
<td>Rear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>93°-54°-70°-38°-104°-64°</td>
<td>1.0</td>
<td>1.64</td>
<td>77mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>20mm AF</td>
<td>f/2.8-f/22</td>
<td>84°-62°-94°</td>
<td>0.85</td>
<td>0.62</td>
<td>62mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>84°-54°-62°-38°-94°-62°</td>
<td>1.7</td>
<td>1.36</td>
<td>77mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>28mm AF</td>
<td>f/2.8-f/22</td>
<td>66°-46°-74°</td>
<td>1.25</td>
<td>0.46</td>
<td>52mm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>28mm AFD</td>
<td>f/1.4-f/16</td>
<td>66°-46°-74°</td>
<td>1.14</td>
<td>1.15</td>
<td>72mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>28-70mm AFD</td>
<td>f/2.0-f/22</td>
<td>66°-29°-46°-20°-74°-34°</td>
<td>2.3(1.5 ft macro)</td>
<td>1.95</td>
<td>77mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>35mm AF</td>
<td>f/2.0-f/22</td>
<td>54°-38°-62°</td>
<td>0.9</td>
<td>0.51</td>
<td>52mm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>35-70mm AF</td>
<td>f/3.3(4.5)-f/22</td>
<td>74°-40°-53°-27°-84°-46°</td>
<td>2.0 (1.6 ft macro)</td>
<td>0.86</td>
<td>62mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-70mm AF</td>
<td>f/2.8-f/22</td>
<td>54°-29°-38°-20°-62°-34°</td>
<td>2.0 (0.9 ft macro)</td>
<td>1.5</td>
<td>62mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50mm AFD</td>
<td>f/1.4-f/16</td>
<td>40°-27°-46°</td>
<td>1.5</td>
<td>0.59</td>
<td>52mm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>60mm AF</td>
<td>f/2.8-f/32</td>
<td>33°-23°-39°</td>
<td>0.73</td>
<td>0.93</td>
<td>62mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>85mm AF</td>
<td>f/1.8-f/16</td>
<td>24°-16°-29°</td>
<td>3.0</td>
<td>0.93</td>
<td>62mm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>105mm AF</td>
<td>f/2.8-f/32</td>
<td>19°-13°-23°</td>
<td>1.0</td>
<td>1.22</td>
<td>52mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>180mm AFD</td>
<td>f/2.8-f/22</td>
<td>11°-8°-13°</td>
<td>5.0</td>
<td>1.72</td>
<td>72mm</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>80-200mm AFD</td>
<td>f/2.8-f/22</td>
<td>25°-10°-17°-7°-30°-12°</td>
<td>6.0</td>
<td>2.98</td>
<td>77mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>300mm AF</td>
<td>f/2.8-f/22</td>
<td>7°-5°-8°</td>
<td>10.0</td>
<td>6.36</td>
<td>39mm</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>400mm AFD</td>
<td>f/2.8-f/22</td>
<td>5°-3°-6°</td>
<td>9.75</td>
<td>10.58</td>
<td>52mm</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
NIKON F5 (Continued)

NOMENCLATURE

1. Mirror Lockup Lever
2. Depth of Field Preview pb
3. Sub–Command Dial
4. Pwr/LCD Panel Illumination
5. Shutter Release pb
6. Pwr sw Lock Release
7. Exposure Compensation pb
8. Exposure Mode pb
9. AF Area Mode pb
10. Camr Back Lock Release
11. Film Rewind Knob
12. PC Connector
13. Selftimer LED
14. Lens Release pb
15. Body Focus Mode Selector
NIKON F5 (Continued)

NOMENCLATURE (Continued)

1. Data Back Control Panel Cover
2. Data Back Controls
   - S/S Start/Stop pb
   - S/R Set/Reset pb
   - FNC Function pb
3. Data Back Batt Chamber Lid Screw
4. Data Back LCD Panel
5. Film Rewind Lever 2
6. Film Rewind Lever 2 Lock Release
7. Alert LED
8. Finder Release pb
9. Eyepiece Shutter Lever
10. Accessory Shoe
11. Viewfinder Eyepiece
12. Auto Exposure/Auto Focus Lock pb
13. AF Start pb
14. Main Command Dial
15. Focus Area Selector
16. AF Start pb (for Vertical Shooting)
17. Film Rewind pb 1 (under door)
18. Rear LCD Panel
19. 10–Pin Remote Terminal
20. Rear Control Panel Cover
21. Body Bracketing pb
22. ISO pb
23. Shutter Speed/Aperture/Focus Area Lock pb
24. Flash Sync Mode pb
25. Custom Setting Menu pb
26. Green Panic pb
NIKON F5 (Continued)

NOMENCLATURE (Concluded)

1. Film Advance Mode/Self Timer Selector
2. Film Rewind Crank
3. Camr Back Lock Release
4. Film Advance Mode Selector Lock Release
5. Interchangeable Focusing Screen
6. Multiple Exposure pb
7. AF Area Mode pb
8. Sub Command Dial
9. Pwr/LCD Panel Illumination sw
10. Shutter Release pb
11. Pwr sw Lock Release
12. Exposure Compensation pb
13. Top LCD Panel
14. Exposure Mode pb
15. Film Plane Indicator
16. Film Rewind Knob
17. Camr Strap Eyelet
18. Diopter Adjustment Knob
19. Metering System Selector
20. Vertical–Shooting Shutter Release pb
22. Camr Strap Eyelet
23. Batt Holder
24. Batt Holder Release Knob
**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

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<tr>
<th>#</th>
<th>Menu</th>
<th>Settings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Selecting Custom Menus</td>
<td>0 - A: Custom settings A</td>
<td>Can specify setting combinations wanted for A,B; makes it easy to switch from one setting combination to another</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 - B: Custom settings B</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Continuous Servo AF</td>
<td>1 - 0: Release-priority</td>
<td>Change from release-priority to focus-priority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 - 1: Focus-priority</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Single Servo AF</td>
<td>2 - 0: Focus-priority</td>
<td>Change from focus-priority to release-priority</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 - 1: Release-priority</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Bracketing Order</td>
<td>3 - 0: Metered value, below metered value, above metered value</td>
<td>Change order to under the metered value, the metered value, and over the metered value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 - 1: Below metered value, metered value, above metered value</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Autofocus Activated When Shutter Release pb Lightly Pressed</td>
<td>4 - 0: Activated</td>
<td>Delete shutter release pb’s AF activation function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 - 1: Disabled</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>AE Lock</td>
<td>5 - 0: Exposure value</td>
<td>Lock shutter speed and aperture for AE lock function</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 - 1: Shutter speed and aperture value</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Direction of Command Dial Rotation</td>
<td>6 - 0: Default</td>
<td>Change from left-to-right to right-to-left when increasing values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 - 1: Opposite</td>
<td></td>
</tr>
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<td>7</td>
<td>AE Lock When Shutter Release pb Lightly Pressed</td>
<td>7 - 0: Disabled</td>
<td>Lock exposure when shutter release pb lightly pressed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 - 1: Activated</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Auto Film Advance to Frame #1</td>
<td>8 - 0: Disabled</td>
<td>Film automatically advances to first frame when Camr back closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 - 1: Enabled (when pwr on)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Film Advance Speed in CH</td>
<td>9 - 0: Default (8 fps)</td>
<td>Change from 8 fps to 6 fps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH8: 8 fps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH6: 6 fps</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Film Advance Speed in CL</td>
<td>10 - 0: Default (3 fps)</td>
<td>Change from 3 fps to 4 fps(5 fps)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CL5: 5 fps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CL4: 4 fps</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CL3: 3 fps</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Alert LED in Long Time Exposure</td>
<td>11 - 0: Does not blink</td>
<td>Make Alert LED blink during long time exposure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 - 1: Blinks</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Auto Film Stop</td>
<td>12 - 0: Disabled (film advances until end of roll)</td>
<td>Stop film advance at frame 35(36)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E35: Frame 35</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E36: Frame 36</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>E--: Disabled</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Multiple Exposure</td>
<td>13 - 0: Canceled after release</td>
<td>Continue multiple exposure after second shot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 - 1: Still on after release</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Center-Weighted Metering</td>
<td>14 - 0: Default (75% concentration in 12mm dia. area)</td>
<td>Change 12mm-dia area to 8mm(15mm,20mm) average metering, or customize diameter (i.e., by using computer link)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C 8: 8mm-dia</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C 12: 12mm-dia</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C 15: 15mm-dia</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C 20: 20mm-dia</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A: Average</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC: Custom (by PC)</td>
<td></td>
</tr>
</tbody>
</table>
### CUSTOM SETTINGS (Continued)

<table>
<thead>
<tr>
<th>#</th>
<th>Menu</th>
<th>Settings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Time Delay for Auto Meter-Switch-Off</td>
<td>15 - 0: Default (16 sec)</td>
<td>Change from 16 sec to 4(8,12) sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L 4: 4 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L 8: 8 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L 16: 16 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L 32: 32 sec</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Self-Timer Duration</td>
<td>16 - 0: Default (10 sec)</td>
<td>Choose from 2 to 60 sec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 - 1: Change setting</td>
<td>Go to L10 to clear setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L 2 to L60: 2 to 60 sec</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Bracketing in Manual Exposure Mode</td>
<td>17 - 0: Default (shifts shutter speed)</td>
<td>Change shifting factor in Manual Exposure mode from shutter speed to choice of shutter speed/aperture combination, aperture, or flash output level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11A: Shutter speed/aperture combination</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10A: Shutter speed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>01A: Aperture</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>00A: Flash output level</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Focusing Screen Compensation</td>
<td>18 - 0: No compensation</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2.0 to 2.0: -2 to +2 in 0.5 EV steps</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Prolong Shutter Speed</td>
<td>19 - 0: Disabled</td>
<td>Choose from 40 sec to 30 min duration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19 - 1: Enabled</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Top TTL, Flash Sync Speed</td>
<td>20 - 0: Default (1/250 sec)</td>
<td>To set top TTL flash sync speed. 1/300 sec* can be selected only in Shutter-Priority Auto or Manual Exposure modes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>300: 1/300 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250: 1/250 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>200: 1/200 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>160: 1/160 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>125: 1/125 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>100: 1/100 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>60: 1/60 sec</td>
<td></td>
</tr>
</tbody>
</table>

*Shutter speed controlled by 1/250 in Programmed Auto or Aperture-Priority Auto exposure modes
### CUSTOM SETTINGS (Concluded)

<table>
<thead>
<tr>
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<th>Menu</th>
<th>Settings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>AE-L/AF-L pb</td>
<td>21 - 0: Default (simultaneous lock)</td>
<td>Change to AE(AF) lock only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AEL: AE lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AFL: AF lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L-L: Simultaneous lock</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Aperture Setting via Sub-Command</td>
<td>22 - 0: Enabled</td>
<td>Only way to set aperture is to rotate lens</td>
</tr>
<tr>
<td></td>
<td>Dial</td>
<td>22 - 1: Disabled</td>
<td>aperture ring</td>
</tr>
<tr>
<td>23</td>
<td>⬆ or ⬇ Focus Indicator</td>
<td>23 - 0: Displayed</td>
<td>Don’t show display of ⬆ and ⬇ (focused at</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 - 1: Not displayed</td>
<td>rear or in front of subject) in viewfinder</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>during Autofocus mode</td>
</tr>
<tr>
<td>24</td>
<td>Auto Exposure/Flash Exposure</td>
<td>24 - 0: Default (auto exposure/flash exposure</td>
<td>When Auto(Flash) Exposure Bracketing only</td>
</tr>
<tr>
<td></td>
<td>Bracketing</td>
<td>24 - 1: Change setting</td>
<td>wanted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>01E: Auto exposure (ambient)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>bracketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10E: Flash exposure bracketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11E: Auto exposure/flash exposure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>bracketing</td>
<td></td>
</tr>
</tbody>
</table>
NIKON F5

2.1 CAMR FAILS TO FIRE

Nominal Config:

(Camr)
Lens – As reqd
Film – As reqd
Settings
Pwr – ON
\Batt icon full
\Frames remaining sufficient
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – [ ]
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
\ISO – DX
\Camr BKT – Disabled
\Focus Area – Center, LOCK displayed
(Data Back)
\Between Frame – YR MO/DY
HR:MIN SEC
\Between Frame Data – PRINT displayed
(Flash)
\ON/OFF – ON
\Mode – TTL, Matrix
\Zoom – Auto
\Tilt – Direct
2.2 CANNOT SEE THRU VIEWFINDER

Cannot See Thru Viewfinder

Nominal Config:

(Camr)
Lens – As reqd
Film – As reqd
Settings
Pwr – ON
√Batt icon full
√Frames remaining sufficient
Exp Comp – 0.0
Exp Mode – P
AF Area Mode –
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus
Mode – S
Lens Focus
Mode – A
Aperture – Min, locked
√ISO – DX
√Camr BKT – Disabled
√Focus Area – Center, LOCK displayed

(Data Back)
√Between Frame – YR MO/DY
HR:MIN SEC
√Between Frame Data – PRINT displayed

(Flash)
ON/OFF – ON
√Mode – TTL, Matrix
√Zoom – Auto
Tilt – Direct

1. □ Eyepiece Shutter Lever open
   View obstructed?
   Yes

2. □ Mirror Lockup Lever released
   View obstructed?
   Yes

3. □ Continue nominal ops

4. □ MCC
NIKON F5

2.3 CAMR FAILS TO AUTOFOCUS

Camr Fails to Auto Focus

Nominal Config:
(Camr)
Lens – As reqd
Film – As reqd
Settings
Pwr – ON
Batt icon full
Frames remaining sufficient
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – [ ]
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
ISO – DX
Camr BKT – Disabled
Focus Area – Center, LOCK displayed
(Data Back)
Between Frame – YR MO/DY
HR:MIN SEC
Between Frame Data – PRINT displayed
(Flash)
ON/OFF – ON
Mode – TTL, Matrix
Zoom – Auto
Tilt – Direct

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

1

• Body Focus Mode – S
Camr autofocuses?

Yes

No

2

• Focus lock center
Camr autofocuses?

Yes

No

3

• Subject not closer than min focus distance or low contrast
Camr autofocuses?

Yes

No

4

If using 35-70mm lens, lens in macro range?

Yes

5

Take lens out of macro range

No

6

• Custom setting #4 activated (on = 4-1)?

Yes

7

Channel A reset (Green Panic pb)
Camr autofocuses?

No

9

MCC

Yes

8

• Return Camr to Nominal Config
• Continue nominal ops

No
NIKON F5

2.4 “ERR” BLINKS ON TOP LCD AND ALERT LED ALSO BLINKS

Nominal Config:
(Camr)
Lens – As reqd
Film – As reqd
Settings
Pwr – ON
• Batt icon full
• Frames remaining sufficient
• Exp Comp – 0.0
• Exp Mode – P
• AF Area Mode – [ ]
• Meter – Matrix
• Diopter – Adjust
• Film Adv – S
• Body Focus Mode – S
• Lens Focus Mode – A
• Aperture – Min, locked
• ISO – DX
• Camr BKT – Disabled
• Focus Area – Center, LOCK displayed
(Data Back)
• Between Frame – YR MO/DY
• HR:MIN SEC
• Between Frame Data – PRINT displayed
(Flash)
• ON/OFF – ON
• Mode – TTL, Matrix
• Zoom – Auto
• Tilt – Direct

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

1
Recycle Camr pwr sw
Blinking “Err” and alert LED disappear?
Yes
2
• Continue nominal ops
No
3
• MCC
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<td>3-11</td>
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<td>3-15</td>
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<tr>
<td>DATE/TIME SET</td>
<td>3-18</td>
</tr>
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<td>3-24</td>
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<td>3.3 CAMR FAILS TO AUTOFOCUS</td>
<td>3-25</td>
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<td>3-26</td>
</tr>
<tr>
<td>3.5 EXCESSIVE SAVE IMAGE TO HARD DISK TIME</td>
<td>3-27</td>
</tr>
</tbody>
</table>
DCS 760

SETUP

760 PROGRAM w/FLASH

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

760 SHUTTER PRIORITY

- Pwr – ON
- Disk installed
- Rear LCD
- Batt
- Frames remaining sufficient
- White Balance – Flash
- 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 – Flash
- ISO – 100
- BKT – BKT, 3F 1.0 displayed
- √Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – S
- SS – 500
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Diopter – Adjust
- Film Adv – C\textsubscript{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 – Flash
- 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 – Flash
√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, F11
4. Focus, Frame, Fire

760 AURORA/AIRGLOW

Lens – 50mm
Pwr – ON
√Disk installed
Rear LCD
√Batt
√Frames remaining sufficient
√White Balance – Flash
√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 – Flash
- 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 – Flash
- 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 – Flash
- ISO – 100
- BKT – Disabled
- Focus Area – Center, LOCK displayed
- CSM – 17-1, 01A
- 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
- Frames remaining sufficient
- White Balance – Flash
- ISO – 100
- BKT – Disabled
- Focus Area – Center, LOCK displayed
- CSM – 21-1, AEL
- Exp Comp – 0.0
- Exp Mode – P
- AF Area Mode – [ ] (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 – Flash
- 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

WARNING
Do not look at Sun

760 SUN STAR EFFECT

- Lens – 16mm
- Pwr – ON
- √Disk installed
- Rear LCD
- √Batt
- √Frames remaining sufficient
- √White Balance – Flash
- ISO – 100
- √BKT – Disabled
- √Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – 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 – Flash
- ISO – 100
- BKT – Disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – S
  - SS – 30
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – S
- Aperture – Min, locked
- Flash Settings
  - ON/OFF – OFF
  - Focus, Frame, Fire
DCS 760 (Continued)

SPECIFICATIONS

CAMR BODY

- CCD SIZE: 18.48mm x 27.65mm
- PIXEL COUNT: 2008 x 3032
- DISK/FRAME: 520 MB: 81 Frames; 1 GB: 117 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, CH (1.5 fps), CL (1.0 fps), CS (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
## LENS DATA

### NOTE
Do not use non-AF lens w/DCS 760

<table>
<thead>
<tr>
<th>Lens</th>
<th>Aperture Range (f/stop)</th>
<th>Approximate Field of View (FOV)</th>
<th>Approx Minimum Focus Distance (ft)</th>
<th>Weight (lb)</th>
<th>Filter Size</th>
<th>M-A Switch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Diagonal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16mm AF</td>
<td>f/2.8-f/22</td>
<td>123°</td>
<td>82°</td>
<td>148°</td>
<td>1.0</td>
<td>0.69</td>
</tr>
<tr>
<td>17-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>78°-43°</td>
<td>57°-30°</td>
<td>89°-51°</td>
<td>1.0</td>
<td>1.64</td>
</tr>
<tr>
<td>20mm AF</td>
<td>f/2.8-f/22</td>
<td>69°</td>
<td>50°</td>
<td>80°</td>
<td>0.85</td>
<td>0.62</td>
</tr>
<tr>
<td>20-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>69°-43°</td>
<td>50°-30°</td>
<td>51°</td>
<td>1.7</td>
<td>1.36</td>
</tr>
<tr>
<td>28mm AF</td>
<td>f/2.8-f/22</td>
<td>53°</td>
<td>37°</td>
<td>61°</td>
<td>1.25</td>
<td>0.46</td>
</tr>
<tr>
<td>28mm AFD</td>
<td>f/1.4-1/16</td>
<td>53°</td>
<td>37°</td>
<td>61°</td>
<td>1.14</td>
<td>1.15</td>
</tr>
<tr>
<td>28-70mm AFD</td>
<td>f/2.8-f/22</td>
<td>53°-22°</td>
<td>37°-15°</td>
<td>61°-27°</td>
<td>2.3(1.5 ft macro)</td>
<td>1.95</td>
</tr>
<tr>
<td>35mm AF</td>
<td>f/2.0-f/22</td>
<td>43°</td>
<td>30°</td>
<td>51°</td>
<td>0.9</td>
<td>0.51</td>
</tr>
<tr>
<td>35-70mm AFD</td>
<td>f/3.3(4.5)-f/22</td>
<td>60°-31°</td>
<td>42°-21°</td>
<td>69°-37°</td>
<td>2.0 (1.6 ft macro)</td>
<td>0.86</td>
</tr>
<tr>
<td>24-50mm AF</td>
<td>f/3.3(4.5)-f/22</td>
<td>43°-22°</td>
<td>30°-15°</td>
<td>51°-27°</td>
<td>2.0 (0.9 ft macro)</td>
<td>1.5</td>
</tr>
<tr>
<td>40mm AF</td>
<td>f/1.4-1/16</td>
<td>31°</td>
<td>21°</td>
<td>37°</td>
<td>1.5</td>
<td>0.59</td>
</tr>
<tr>
<td>50mm AFD</td>
<td>f/1.4-1/16</td>
<td>26°</td>
<td>18°</td>
<td>31°</td>
<td>0.73</td>
<td>0.93</td>
</tr>
<tr>
<td>60mm AF</td>
<td>f/2.8-f/32</td>
<td>19°</td>
<td>12°</td>
<td>22°</td>
<td>3.0</td>
<td>0.93</td>
</tr>
<tr>
<td>85mm AF</td>
<td>f/1.8-1/16</td>
<td>15°</td>
<td>10°</td>
<td>18°</td>
<td>1.0</td>
<td>1.22</td>
</tr>
<tr>
<td>105mm AF</td>
<td>f/2.8-f/32</td>
<td>9°</td>
<td>6°</td>
<td>11°</td>
<td>5.0</td>
<td>1.72</td>
</tr>
<tr>
<td>180mm AFD</td>
<td>f/2.8-f/22</td>
<td>20°-8°</td>
<td>13°-5°</td>
<td>24°-10°</td>
<td>6.0</td>
<td>2.98</td>
</tr>
<tr>
<td>80-200mm AFD</td>
<td>f/2.8-f/22</td>
<td>5°</td>
<td>4°</td>
<td>6°</td>
<td>10.0</td>
<td>6.36</td>
</tr>
<tr>
<td>300mm AF</td>
<td>f/2.8-f/22</td>
<td>4°</td>
<td>3°</td>
<td>5°</td>
<td>9.75</td>
<td>10.58</td>
</tr>
<tr>
<td>400mm AFD</td>
<td>f/2.8-f/22</td>
<td>4°</td>
<td>3°</td>
<td>5°</td>
<td>9.75</td>
<td>10.58</td>
</tr>
</tbody>
</table>
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
NOMENCLATURE (Continued)

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

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

Open Batt/PC Card Door
DCS 760 (Continued)

NOMENCLATURE (Concluded)

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

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

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

<table>
<thead>
<tr>
<th>#</th>
<th>Menu</th>
<th>Settings</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Focusing Screen Compensation</td>
<td>18 - 0: No compensation</td>
<td>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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2.0 to 2.0: -2 to +2 in 0.5 EV steps</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Prolong Shutter Speed</td>
<td>19 - 0: Disabled</td>
<td>Choose from 40 sec to 30 min duration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19 - 1: Enabled</td>
<td>Long exposures may add noise and produce a less desirable image. Images should not be &gt; 0.5 sec</td>
</tr>
<tr>
<td>20</td>
<td>Top TTL, Flash Sync Speed</td>
<td>20 - 0: Default (1/250 sec)</td>
<td>To set top TTL flash sync speed. 1/300 sec* can be selected only in Shutter-Priority Auto or Manual Exposure modes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>300: 1/300 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>250: 1/250 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>200: 1/200 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>160: 1/160 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>125: 1/125 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>100: 1/100 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>80: 1/80 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>60: 1/60 sec</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>AE-L/AF-L pb</td>
<td>21 - 0: Default (simultaneous lock)</td>
<td>Change to AE(AF) lock only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AEL: AE lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>AFL: AF lock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L-L: Simultaneous lock</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Aperture Setting via Sub-Command Dial</td>
<td>22 - 0: Enabled</td>
<td>Only way to set aperture is to rotate lens aperture ring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 - 1: Disabled</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td> or  Focus Indicator</td>
<td>23 - 0: Displayed</td>
<td>Don’t show display of  and  (focused at rear or in front of subject) in viewfinder during Autofocus mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 - 1: Not displayed</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Auto Exposure/Flash Exposure Bracketing</td>
<td>24 - 0: Default (auto exposure/flash exposure bracketing)</td>
<td>When Auto(Flash) Exposure Bracketing only wanted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 - 1: Change setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>01E: Auto exposure (ambient) bracketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10E: Flash exposure bracketing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11E: Auto exposure/flash exposure bracketing</td>
<td></td>
</tr>
</tbody>
</table>
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 ( микрофон icon appears on rear LCD)
4. Talk to MIC (~9-12 in from MIC)
5. Speaker icon appears under image
**IMAGE VIEWING ON PGSC**

1. Insert DCS MICRO DRIVE (1 GB EVA Flash Card) into PGSC, brand name up

2. Open SHUTTLE APPS | KODAK DCS PHOTO DESK

3. Sel FILE | OPEN

4. Sel appropriate drive/folder

5. Sel "Open ‘-------’ as contact sheet"

6. To view image info:
   - Sel VIEW
     - Image Info selected (check mark next to Image Info)
     - Single-click on desired image

7. To view enlarged individual image:
   - Double-click on desired image
DCS 760 (Continued)

DCS FILE DNLK

NOTE
MCC will delete images after dnlk. To save image onboard, copy files to PGSC hard drive. MCC will not delete from this folder

DNLK FROM MICRO DRIVE

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

DNLK FROM HARD DRIVE (TO FREE UP MICRO CARD OR SLOT)

1. Insert DCS MICRO DRIVE(1 GB EVA Flash Card) into any networked PGSC, brand name up
2. Inform MCC “files ready” on PGSC
3. Delete image files from DCS MICRO DRIVE(1 GB EVA Flash Card) when file copy complete or instruct MCC to do so
DCS 760 (Continued)

**SUSPECT HARD DRIVE SCAN**

1. Insert suspect DCS MICRO DRIVE (1 GB EVA Flash Card) into PGSC, brand name (white decal) up

2. Sel ‘Start’ | ‘Run…’

3. In ‘Run’ window, type: SCANDISK, then sel OK

4. In ‘ScanDisk’ window:
   - Sel MICRO DRIVE drive (usually D: drive)
   - ‘Type of Test’ – Standard
   - Sel ‘Automatically fix errors’
   - Sel ‘Start’

5. In ‘ScanDisk Results’ Window:
   - If error fixed (nonexistent), continue to use hard drive
   - If error not fixed, mark and stow hard drive
   - Notify MCC of results

6. Close all windows used to scan hard drive
DCS 760 (Continued)

IMAGE FILE COMPRESSION

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

1. Perform IMAGE VIEWING ON PGSC, steps 1-5 on 3-19, then:

2. Single-click image for compression

3. Sel FILE | SAVE SELECTED AS (Not “SAVE AS”)

4. Sel appropriate drive and folder in “Save In” window

5. Sel “Standard JPEG” (*.jpg)” in format window

6. Sel RENAME IMAGE FILE(S)

If A31p:

7. Enter new file name in “Base Name” window

8. Sel “Save files in ‘-------’ ”

If PGSC 760XD:

9. Enter new file name in New Name window

10. Sel “Save files in ‘-------’ ”

11. Sel IMAGE SIZE = 50%

12. Sel IMAGE QUALITY = GOOD

13. √RESOLUTION = 300

14. √DOTS PER INCH selected

15. Sel OK
DCS 760

3.1 CAMR FAILS TO FIRE

Camr Fails to Fire

Nominal Config:

(Camr)
  Pwr – ON
  √Disk installed
  Rear LCD
  √Batt
  √Frames remaining sufficient
  √White Balance – Flash
  ISO – 100
  √BKT disabled
  √Focus Area – Center, LOCK displayed
  Exp Comp – 0.0
  Exp Mode – P
  AF Area Mode – [
  Meter – Matrix
  Diopter – Adjust
  Film Adv – S
  Body Focus Mode – S
  Lens Focus Mode – A
  Aperture – Min, locked

(Flash)
  ON/OFF – ON
  √TTL, Matrix
  √Zoom
  Tilt – Direct

1
• √Batt
• Replace if low
Camr fires?

2
• √Disk installed
• √Frames remaining ≥ 1 (LCD disk icon not blinking)
Camr fires?

3
• √Focus area – Center
• √Subject contrast – Adequate
• √Lt level sufficient
Camr fires?

4
• √Channel A CSM setting #4 not activated (off = 4-0)
Camr fires?

5
• Continue nominal ops

6
• √MCC

No

Yes
3.2 CANNOT SEE THRU VIEWFINDER

1. Eyepiece Shutter Lever open
   View obstructed?
   No
   Yes

2. Mirror Lockup Lever released
   View obstructed?
   No
   Yes

3. Continue nominal ops

4. MCC

Nominal Config:
(Camr)
- Pwr – ON
- Disk installed
- Rear LCD
- Batt
- Frames remaining sufficient
- White Balance – Flash
- ISO – 100
- BKT disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – P
- AF Area Mode – [ ]
- Meter – Matrix
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – S
- Lens Focus Mode – A
- Aperture – Min, locked
(Flash)
- ON/OFF – ON
- TTL, Matrix
- Zoom
- Till – Direct
3.3 CAMR FAILS TO AUTOFOCUS

Nominal Config:
(Camr)
- Pwr – ON
- Disk installed
- Rear LCD
- Batt
- Frames remaining sufficient
- White Balance – Flash
- ISO – 100
- BKT disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – P
- AF Area Mode – [ ]
- Meter – Matrix
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – S
- Lens Focus Mode – A
- Aperture – Min, locked

(Flash)
- ON/OFF – ON
- TTL, Matrix
- Zoom
- Tilt – Direct

1.35-70mm lens will not auto-focus in Macro

1. Body Focus Mode – S
   - Camr autofocuses?
     - Yes
     - No

2. Focus area center
   - Camr autofocuses?
     - Yes
     - No

3. Subject not closer than min focus distance or low contrast
   - Camr autofocuses?
     - Yes
     - No

4. If using 35-70mm lens, lens in macro range?
   - Yes
   - 5. Take lens out of macro range
   - No

5. Custom setting #4 activated (on = 4-1)?
   - Yes
   - 7. Channel A reset (Green Panic pb)
   - No

6. Return Camr to Nominal Config
   - Continue nominal ops
3.4 “ERR” BLINKS ON TOP LCD AND ALERT LED ALSO BLINKS

Nominal Config:
(Camr)
Pwr – ON
√Disk installed
Rear LCD
√Batt
√Frames remaining sufficient
√White Balance – Flash
ISO – 100
√BKT disabled
√Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – [ ]
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus
Mode – S
Lens Focus
Mode – A
Aperture – Min, locked
(Flash)
ON/OFF – ON
√TTL, Matrix
√Zoom
Tilt – Direct

1
• Recycle Camr pwr sw
Blinking “Err” and alert LED disappear?

2
• Continue nominal ops

3
• MCC

Recycle Camr pwr sw
Blinking “Err” and alert LED disappear?
No

Yes

MCC

12/20/02 3-26
3.5  EXCESSIVE SAVE IMAGE TO HARD DISK TIME

Nominal Config:
(Camr)
Pwr – ON
√ Disk installed
Rear LCD
√ Batt
√ Frames remaining
√ White Balance – Flash
ISO – 100
√ BKT disabled
√ Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – [ ]
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked
(Flash)
ON/OFF – ON
√ TTL, Matrix
√ Zoom
Tilt – Direct

1. Replace Flash Card (PCMCIA)
   Label faulty Flash Card (PCMCIA)
   and perform SUSPECT HARD DRIVE SCAN, 3-21

2. Improved save image time after Camr fires?
   Yes
   √ Continue nominal ops
   No

3. √ MCC
DCS 760 EVA CAMR

760 EVA – CAMR ONLY

**NOTE**

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

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

2. **Unstow but do not install**
   - 1 GB EVA Flash Cards (two)
   - EVA Camr Blanket
   - Camr Mounting Assy w/Thermal Blanket

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

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

---

DCS Batt Charger Pwr Supply

DCS 760 Pwr Cable (15 ft)
(SEZ33112997–301)

DCS Pwr Adapter
Cable 28VDC (6 ft)
(SEZ33112998–301)

DC UTIL PWR
(Per Plug In Plan)
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR ONLY (Continued)

DCS 760  4. Camr Settings (Concluded)

√ ISO – 100
√ Camr Bracket Disabled
Top LCD
√ Focus Area – Center, Locked
 Exposure Comp – 0.0
 Exposure Mode – P
 Auto Focus Area Mode – [ ] (no “+” displayed)
Meter – Matrix
Film Advance – S
Body Focus Mode – S
Lens Focus Mode – A (if applicable)
Aperture – Min, locked
√ Vertical Shooting Shutter Release – Locked (L to line)
Main Menu
 Menu pb – press
 Main Menu – press OK
√ Processing – Off
√ Time/Date – GMT
 Menu pb – press twice
Properties
 Properties – press OK
 Auto OK Errors – Yes
√ Enable Sharpening – No
 High Temp Limit – Yes
√ Long Exposure Processing – Exposures >¼ sec
 CANCEL pb – press twice

5. Remove Lens

NOTE
Do not pwr off Camr

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

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

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

760 EVA – CAMR ONLY (Continued)

9. √ Aperture – Min, locked on lens
10. Install lens (EVA Camr Blanket may need to be adjusted)
11. √ Lens Cap removed
12. Secure EVA Camr Blanket around lens
13. Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr
14. CAMR PWR – ON (LED on)

DCS Batt

15. Install DCS 760 Batt
16. Activate Shutter Release:
   √ No “EE” in Viewfinder
   If “EE” displayed, go to step 9
   √ Lens moves freely under EVA Camr Blanket
17. Insert Light-Pipe thru Batt/PC Door into Card Busy LED opening
18. Test fire to confirm Light-Pipe operational – Blinking Red LED on EVA Camr Blanket
19. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
20. Complete EVA Camr Blanket installation (close Flaps 1,4)
21. Install Camr Mounting Assy w/Thermal Blanket from rear
22. √ Camr Mounting Assy seated, will not slip off Camr. Release pb – out
23. Temp stow Flap 3 (will not be used for EVA)
24. Stow Camr until day of EVA
If Remote Cord Assy used:
25. Connect Remote Cord Assy to Remote Release port on DCS 760 Camr (Connector will thread into place)

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

NOTE
Do not remove Camr from orbiter pwr

31. Stow until day of EVA
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR ONLY DISASSEMBLY

BETWEEN EVAs

NOTE
Removal of Batts, Cards main objective

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

POST-EVA

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

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

If reqd:

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

760 EVA – CAMR w/BRACKET ONLY

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

1. Unstow and assemble from EVA Camr Accessories Bag
   DCS 760 Camr
   Lens – As Req’d
   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 req’d

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

DCS 760 4. Camr Settings
   Pwr – ON
   Install 1 GB EVA Flash Card in slot 1
   Rear LCD
      √Frames Remaining ≥112
      If <112, perform 760 QUICK FORMAT, 4-29
   Remove 1 GB EVA Flash Card
   Install second 1 GB EVA Flash Card in slot 1
   Rear LCD
      √Frames Remaining ≥112
      If <112, perform 760 QUICK FORMAT, 4-29
   Install first 1 GB EVA Flash Card in slot 2
   √White Balance – Flash
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

INITIAL CAMR SETUP (Continued)

DCS 760 4. Camr Settings (Concluded)

√ISO – 100
√Camr Bracket Disabled
Top LCD
√Focus Area – Center, Locked
   Exposure Comp – 0.0
   Exposure Mode – P
   Auto Focus Area Mode – [ ] (no “+” displayed)
Meter – Matrix
Film Advance – S
Body Focus Mode – S
Lens Focus Mode – A (if applicable)
Aperture – Min, locked
√Vertical Shooting Shutter Release – Locked (L to line)
Main Menu
   Menu pb – press
   Main Menu – press OK
   √Processing – Off
   √Time/Date – GMT
   Menu pb – press twice
Properties
   Properties – press OK
   Auto OK Errors – Yes
   √Enable Sharpening – No
   High Temp Limit – Yes
   √Long Exposure Processing – Exposures >¼ sec
   CANCEL pb – press twice

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)

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
14. CAMR PWR – ON (LED on)

DCS Batt Chgr
15. Install DCS 760 Batt
16. Activate Shutter Release:
   √No “rEE” in viewfinder
   If “rEE” 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
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)

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

NOTE
Do not remove Camr from orbiter pwr

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

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

Remote Cord Lip
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

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

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

32. Remove Flap 3 from EVA Camr Blanket
   Place Remote Cord Assy into Flap 3 per photo; close flaps

33. Using Velcro, secure Flap 3 to EVA Camr Blanket (DO NOT snap Flap 3)
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Concluded)

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

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

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

38. Stow until day of EVA
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH

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

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

2. Unstow but do not install
   1 GB EVA Flash Cards (two)
   EVA Camr Blanket
   Camr Mounting Assy w/Thermal Blanket
   Bracket Assy w/Thermal Blanket
   MF71H
   EVA Flash w/Thermal Blanket
   Flash Sync Cable Assy w/Thermal Blanket
   Remote Cord Assy (SED33112525-302)
   DCS EVA 7 VDC Pwr Cable

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

DCS 760

4. Camr Settings
   Pwr – ON
   Install 1 GB EVA Flash Card in slot 1
   Rear LCD
   √Frames Remaining ≥112
   If <112, perform 760 QUICK FORMAT, 4-29
   Remove 1 GB EVA Flash Card
   Install second 1 GB EVA Flash Card in slot 1
   Rear LCD
   √Frames Remaining ≥112
   If <112, perform 760 QUICK FORMAT, 4-29
   Install first 1 GB EVA Flash Card in slot 2
   √White Balance – Flash
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

DCS 760  4. Camr Settings (Concluded)

- ISO – 100
- Camr Bracket Disabled
- Top LCD
  - Focus Area – Center, LOCK
  - Exposure Comp – 0.0
  - Mode – P
  - Auto Focus Area Mode – [ ] (no “+” displayed)
- Meter – Matrix
- Film Advance – S
- Body Focus Mode – S
- Lens Focus Mode – A (if applicable)
- Aperture – Min, locked
- Vertical Shooting Shutter Release – Locked (L to line)

Main Menu
- Menu pb – press
  - Main Menu – press OK
- Processing – Off
- Time/Date – GMT
- Menu pb – press twice
- Properties
  - Properties – press OK
  - Auto OK Errors – Yes
  - Enable Sharpening – No
  - High Temp Limit – Yes
  - Long Exposure Processing – Exposures >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)

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<td>8.</td>
<td>Install EVA Camr Blanket starting at right side of Camr and stopping short of covering Batt/PC Door</td>
</tr>
<tr>
<td>9.</td>
<td>Aperture – Min, locked on lens</td>
</tr>
<tr>
<td>10.</td>
<td>Install lens (EVA Camr Blanket may need to be adjusted)</td>
</tr>
<tr>
<td>11.</td>
<td>Lens Cap removed</td>
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<tr>
<td>12.</td>
<td>Secure EVA Camr Blanket around lens</td>
</tr>
<tr>
<td>13.</td>
<td>Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr</td>
</tr>
<tr>
<td>14.</td>
<td>CAMR PWR – ON (LED on)</td>
</tr>
<tr>
<td>15.</td>
<td>Install DCS 760 Batt</td>
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</table>
| 16. | Activate Shutter Release:  
| | No “_EE” in Viewfinder  
| | If “_EE” 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 |
| 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](image-url)
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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

33. Connect DCS EVA 7 VDC Pwr Cable to Ext Camr Pwr port (small) on EVA Flash under Flap A
34. Run Remote Cord Assy and DCS EVA 7 VDC Pwr Cable under Flap B
35. Close Flap B using two snaps
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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

NOTE
Adjustments to cables may be reqd during installation

38. Remove EVA Camr Blanket Flap 3 from EVA Camr Blanket
Place Remote Cord Assy and DCS EVA 7 VDC Pwr Cable into Flap 3 per photo; close flaps
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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

EVA Flash
41. Access Flash Batt Compartment (remove Flap(s) C as reqd)
42. Remove Batt Cap
43. Install one DCS 760 Batt into FLASH slot (align arrows)
44. Reinstall Batt Cap
45. Flash – ON
46. Activate Camr
47. Open Flap D; verify following:
   √ Mode – TTL BL
   If TTL BL not displayed, press viewfinder Forward
   √ Zoom – “M” not displayed
   If “M” displayed, contact MCC

DCS 760
48. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
49. Test fire Camr w/Flash using Remote Release (two shots)
50. Flash fired

EVA Flash
51. Flash – OFF
52. Close Flap D
53. Remove DCS 760 Batt from FLASH slot

DCS 760
54. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

NOTE
Do not remove Camr from orbiter pwr

55. Stow until day of EVA
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Concluded)

PRIOR TO ENTERING AIRLOCK:

EVA Flash
1. Remove Batt Cap
2. Install two DCS 760 Batts into CAMERA, FLASH slots (align arrows)
3. Reinstall Batt Cap
4. Flash – ON
5. Activate Camr
6. Open Flap D; verify following:
   √ Mode – [TTL] [BL]
   If [TTL] [BL] not displayed, press viewfinder Forward
   √ Zoom – “M” not displayed
   If “M” displayed, contact MCC

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

EVA Flash
10. Flash – OFF
11. Close Flap D
12. Close Flap C
13. CAMR BATT PWR – EXT

DCS Batt
14. Camr Pwr – off

Chgr

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

760 EVA – CAMR w/FLASH DISASSEMBLY

BETWEEN EVAs

NOTE
Removal of Batts, Cards main objective

FLASH

1. Flash – OFF
2. Open Flap C to access Flash Batt compartment
3. Remove Batt Cap
4. Remove DCS 760 Batt (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)
NOTE
Stowing of EVA H/W and IVA use of DCS 760 main objective

CAMR w/FLASH

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

CAMR

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

760 EVA – CAMR w/FLASH DISASSEMBLY (Concluded)

POST-EVA (Concluded)

EVA FLASH AND FLASH BRACKET

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

RETURN CAMR TO NOM OPS (as reqd)

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

SPECIFICATIONS

CAMR BODY

CCD SIZE: 18.48mm x 27.65mm
PIXEL COUNT: 2008 x 3032
DISK/FRAME: 1 GB: 112 Frames
FILE SIZE: 6 MB
EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual
METER PATTERN: 3D Color Matrix, Center Weighted, Spot
EXPOSURE COMP: ±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, CH (1.5 fps), CL (1.0 fps), CS (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

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

PGSC

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

CAMR

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

NOTE

Process must be completed two times to update both Firmware slots

21. OK pb – OK
22. Repeat steps 4-21, then go to step 23
23. PWR – OFF
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
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 – Flash
ISO – 100
√BKT disabled
√Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – M
SS – 30
AF Area Mode – [ ] (no “+”)
Meter – Matrix
Diopter – Adjust
Film Adv – S
Body Focus Mode – M
Aperture – Min, locked (‘--’ displayed on top LCD when no Lens installed)
Flash Settings
ON/OFF – OFF

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

CAMR SETTINGS – DEACTIVATION

Exp Mode – P
Body Focus Mode – S
Flash Settings
ON/OFF – ON
DCS 760 EVA CAMR (Concluded)

STEREO 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

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 – up (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 Reqd (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)

SPECIFICATIONS

CAMR
PIXEL COUNT: 320 x 240
SPECTRAL RANGE: 7.5µm-13µm (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)
EMISSION 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))
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
EVA IR CAMR (Continued)

NOMENCLATURE (Continued)

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

F/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)

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

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

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
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.

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

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

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 – up (hold for 3 sec)
3. MASTER sw – OFF
4. Lens Cover – cl
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. Batt status LED green or flashing red & green?
   1. Yes
   2. No
   3. “Manual” or “Level/Span Manual” text displayed on LCD?
      1. Yes
      2. No
      3. Press, hold F/A and C/L pbs simo (3 sec)
         LCD displays image or data?
            1. Yes
            2. No

2. ENABLE sw is a momentary sw

3. Set up procedure or contact MCC for Burst Setup Settings

4. • ENABLE sw – up (wait 10 sec)
   Batt status LED green or flashing red & green?
      1. Yes
      2. No

5. • Set up procedure or contact MCC for Burst Setup Settings

6. • MASTER sw – OFF
   • Reseat EHIP Batt
   • MASTER sw – ON (wait 20 sec)
   Batt status LED green or flashing red & green?
      1. Yes
      2. No

7. LCD has data on display?
   1. Yes
   2. No

8. Camr Location
   1. EVA
   2. IVA

9. • √MCC

10. • MASTER sw – OFF
    • Replace EHIP Batt
    • MASTER sw – ON (wait 20 sec)
    Batt status LED green or flashing red & green?
       1. Yes
       2. No

11. LCD has data on display?
    1. Yes
    2. No

12. • Continue nominal ops

13. • √MCC

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

5.2 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/Span:
Manual" or "Manual" not displayed on LCD

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

1
• ENABLE sw – up
  (hold for 3 sec)
• ENABLE sw – up
  (wait 10 sec)

Does Camr focus via RCU?
Yes

CAUTION
Removing master pwr will erase RAM data and remove heater pwr to RCU, Camr

2
• MASTER sw – OFF, then ON
  (wait 20 sec)

Does Camr focus via RCU?
Yes

3
• Continue nominal ops

No

4
• MCC

1 ENABLE sw is a momentary sw
5.3 BATT LED NOT SOLID GREEN

1. Batt status LED flashing red & green?
   - Yes
   - No

2. ENABLE sw – up (wait 10 sec)
   - Batt status LED solid green?
   - Yes
   - No

3. Batt status LED flashing red & green?
   - Yes
   - No

4. If movies in RAM, transfer movies to CF Card

5. POSSIBLE BAD EHIP BATT

6. Camr Location
   - EVA
   - IVA

7. ENABLE sw – up (hold 3 sec)
   - MASTER sw – OFF
   - Replace EHIP Batt
   - MASTER sw – ON (wait 20 sec)
   - Batt LED solid green?
   - No
   - Yes

8. MCC
   - Yes

9. Continue nominal ops

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 WILL NOT RECORD

1. Press and release S/T pb
   Does Camr record?

   Yes
   No

2. Is RAM full?
   (‘0’ displayed on left-hand side of focus distance)

   Yes
   No

3. Transfer movies to CF Card
   Can a movie be recorded?

   Yes
   No

   ENABLE sw – up (hold 3 sec)
   ENABLE sw – up (wait 10 sec)

   Can a movie be recorded?

   Yes
   No

CAUTION

Removing master pwr will erase RAM data and remove heater pwr to RCU, Camr

4. MASTER sw – OFF, then ON (wait 20 sec)
   Can a movie be recorded and transferred?

   Yes
   No

5. Press, hold F/A and C/L pbs simo (3 sec)
   Set up procedure or contact MCC for Burst setup settings
   Can a movie be recorded and transferred?

   Yes
   No

6. Continue nominal ops

   No

7. √MCC

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
5.5 WHITE LCD WITH “HOT” TEXT

White LCD With “Hot” Text

Nominal Config:
- 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. Point RCU toward dark space (wait 30 sec)
   Is “HOT” msg still displayed?
   Yes 2
   No

2. MCC
   Yes
   No

3. Continue nominal ops
If CF Card not properly installed, Burst record settings are not configurable via menu.
Has step 9 been previously performed?

Yes

CAUTION
Removing master pwr will erase RAM data and remove heater pwr to RCU, Camr

No

MASTER sw – OFF, then ON (wait 20 sec)
Can a movie be recorded and transferred?

Yes

Continue nominal ops

No

MCC
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Not being flown
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<td>PD100 TO DSR-20 VTR</td>
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SONY PD100

ANALOG PAO CC

Config H/W per dwg at right

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

O19(MO58F)
√TV PWR – ON

CC
√Wide Conversion lens installed
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

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
When ready for dnlk:

A7
√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
SONY PD100 (Continued)

DIGITAL PAO CC

Config H/W per dwg at right
To compose scene but not dnlk:
L10 (MUX) VTR/CC PWR – on (LED 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
Multiuse Brkt, Clamp
F1(MO52J) AC UTIL PWR AC1 – ON
Photoflood ON/OFF – ON
HI/LO – HI
Cabin Lts Fit 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
When ready to dnlk signal:
L10 (MUX) MUX/VTR/CC PWR – on (LED on)
√MUX BYPASS – ACT
√CHANNEL 3 DATA LED – on
SONY PD100 (Continued)

SPECIFICATIONS

TAPE: Mini DVCAM Cassette
TAPE LENGTH: 40 min
SENSING AREA: 1/4-in Color CCD (three) (5.08mm Horizontal, 3.81mm Vertical, 6.35mm Diagonal)
VIEWFINDER: Color
LCD: Color, 3.5 in
ZOOM: 12X, 48X Digital Zoom
FOCAL LENGTH: 4.3mm to 51.6mm
APERTURE: f/1.6-2.6 - f/11
MICROPHONE: Built-in Stereo Electric Condenser
AUDIO: 16-Bit at 48KHz
MINIMUM ILLUMINATION: 4 Lux at f/1.6
POWER: 7.2V Batt
8.4V DC IN
BATT LIFETIME: ~60 min
BODY WEIGHT: 2.5 lb
BATT WEIGHT: 0.41 lb

WIDE ANGLE CONVERTER

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

LENS DATA

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<th>Zoom Ratio</th>
<th>Approximate Field of View</th>
<th>Filter Size</th>
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<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(°)</td>
</tr>
<tr>
<td>4.3-51.6mm</td>
<td>12:1</td>
<td>61.1°-5.6°</td>
<td>47.8°-4.2°</td>
</tr>
<tr>
<td>w/Wide Conversion Lens 3.0-36mm</td>
<td>12:1</td>
<td>80.3°-8.0°</td>
<td>64.7°-6.0°</td>
</tr>
</tbody>
</table>
SONY PD100 (Continued)

NOMENCLATURE

1 VOLUME pb
2 LCD OPEN sw
3 LCD BRIGHT pb
4 LCD Screen
   Tape Remaining
   Manual Focus
   White Balance Icon

5 ND FILTER pb
6 FADE 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
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

Accessory Shoe
Focus Ring
Tape Transport pbs
STOP (stop)
REW (rewind)
PLAY (playback)
FF (fast forward)
PAUSE (pause)
REC (record)
Zoom Control
TC RESET pb
Viewfinder
Display Window
FOCUS sw
PUSH AUTO pb
Memory Release pb (not visible)
Built-in Microphone
REC Lamp
Remote Sensor
SONY PD100 (Continued)

NOMENCLATURE (Continued)

1. Cassette Eject
2. Zoom Control
3. Cassette Compartment
4. MIC PLUG–IN Pwr
5. Wide Conversion Locking Collar
6. Wide Conversion Lens
7. S VIDEO Jack
8. AUDIO/VIDEO Jack
9. Headphone Jack
10. LANC Jack
11. DV IN/OUT Jack
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
SONY PD100 (Continued)

NOMINAL MENU SETTINGS

**CAMR MODE**

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<tr>
<td>AUTO SHUTTER – ON</td>
<td></td>
</tr>
<tr>
<td>PROG SCAN – OFF</td>
<td></td>
</tr>
<tr>
<td><strong>CAMR SET</strong></td>
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<tr>
<td>D.ZOOM – OFF</td>
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</tr>
<tr>
<td>16:9 WIDE – OFF</td>
<td></td>
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<tr>
<td>STEADYSHOT – ON</td>
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<tr>
<td>AE SHIFT – “center”</td>
<td></td>
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<tr>
<td>GAIN SHIFT – 0dB</td>
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</tr>
<tr>
<td>FRAME REC – OFF</td>
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</tr>
<tr>
<td>INT REC – OFF</td>
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<tr>
<td><strong>LCD/VF SET</strong></td>
<td></td>
</tr>
<tr>
<td>LCD B.L. – BRT Normal</td>
<td></td>
</tr>
<tr>
<td><strong>CM SET</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>TAPE SET</strong></td>
<td></td>
</tr>
<tr>
<td>AUDIO MODE – FS48K</td>
<td></td>
</tr>
<tr>
<td>MIC LEVEL – AUTO</td>
<td></td>
</tr>
<tr>
<td>[@@] REMAIN – ON</td>
<td></td>
</tr>
<tr>
<td>TIME CODE – DF</td>
<td></td>
</tr>
<tr>
<td><strong>SETUP MENU</strong></td>
<td></td>
</tr>
<tr>
<td>CLOCK SETUP – set per GMT</td>
<td></td>
</tr>
<tr>
<td>LTR SIZE – NORMAL</td>
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<td><strong>OTHER</strong></td>
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<tr>
<td>WORLD TIME – 0</td>
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<td>BEEP – NORMAL</td>
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<tr>
<td>COMMANDER – ON</td>
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<tr>
<td>DISPLAY – LCD</td>
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<tr>
<td>REC LAMP – ON</td>
<td></td>
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<tr>
<td>COLOR BAR – OFF</td>
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</table>

**VTR MODE**

<table>
<thead>
<tr>
<th>Setting</th>
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</thead>
<tbody>
<tr>
<td><strong>VTR SET</strong></td>
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</tr>
<tr>
<td>HiFi SOUND – STEREO</td>
<td></td>
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<tr>
<td>AUDIO MIX – “left” (ST1)</td>
<td></td>
</tr>
<tr>
<td><strong>LCD/VF SET</strong></td>
<td></td>
</tr>
<tr>
<td>LCD COLOR – “center”</td>
<td></td>
</tr>
<tr>
<td>VF BRIGHT – “center”</td>
<td></td>
</tr>
<tr>
<td><strong>MEMORY SET</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>CM SET</strong></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>TAPE SET</strong></td>
<td></td>
</tr>
<tr>
<td>AUDIO MODE – FS48K</td>
<td></td>
</tr>
<tr>
<td>MIC LEVEL – AUTO</td>
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<tr>
<td>[@@] REMAIN – ON</td>
<td></td>
</tr>
<tr>
<td>DATA CODE – DATE/CAM</td>
<td></td>
</tr>
<tr>
<td>TIME CODE – DF</td>
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<tr>
<td><strong>SETUP MENU</strong></td>
<td></td>
</tr>
<tr>
<td>LTR SIZE – NORMAL</td>
<td></td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
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</tr>
<tr>
<td>BEEP – NORMAL</td>
<td></td>
</tr>
<tr>
<td>COMMANDER – ON</td>
<td></td>
</tr>
<tr>
<td>DISPLAY – LCD</td>
<td></td>
</tr>
<tr>
<td>DV EDITING – N/A</td>
<td></td>
</tr>
</tbody>
</table>
SONY PD100 (Continued)

MANUAL SETTINGS

FOCUS

MANUAL FOCUS
PWR – CAMERA
FOCUS sw – MANUAL (√ F  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
√ AE displayed
CONTROL tw – press
Adjust aperture as reqd
To exit Aperture:
  PROGRAM AE pb – press
  √ No AE displayed
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

Digital CC Vid/Pwr Cable (15 ft) (SEZ16103275–503)

DTV IEEE 4–4 Pin Cable (SDZ16103652–801)

TV Pwr Cable (10 ft or 20 ft) (2293284–504(503)/528–20650–1(3))
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

---

Digital CC Vid/Pwr Cable (15 ft)
(SEQU16103275–503)

Digital CC Vid/Pwr Cable (10 ft or 20 ft)
(2293286–504(503)/526–20650–1(3))

TV Pwr Cable
(15 ft)
(2293286–504(503)/526–20650–1(3))

Digital CC Vid/Pwr Cable (15 ft)
(SEQU16103275–503)

DTV IEEE 4–4 Pin Cable
(SEZ16103652–503)
SONY PD100 (Continued)

PD100 TO V10 VIA ORBITER TV SYSTEM

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

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

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

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

A7
VID OUT MON 1(2) pb – push
IN FLT DECK(MIDDECK) pb – push

Perform following for each video segment:
CC
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)
SONY PD100 (Continued)

PD100 TO DSR-20 VTR

Config H/W per dwg at right

L10 (MUX)  VTR/CC PWR – on (LED on)
(VTR)   ON/STANDBY – push (green LED on)
INPUT SELECT – push twice to change from VIDEO to DV
Install new tape

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

When complete:

L10 VTR
INPUT SELECT – push once to change
   from DV to VIDEO
Remove,mark tape
ON/STANDBY – push (red LED on)
Remove, stow IEEE 1394 female cable
(MUX)  VTR/CC PWR – off (LED off) as reqd
Reconnect IEEE 1394 male cable to IEEE 1394 connector

NOTE
Remove Batt/Adapter to install DTV IEEE 1394 w/Batt Adapter Cable
(Not Used)
SONY PD100 (Concluded)

PD100 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

TV Pwr Cable (10 ft or 20 ft)
(2293284–504/528–20650–1, 2293284–503/528–20650–3)
## SONY V10

<table>
<thead>
<tr>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>V10 FROM MON 1</td>
<td>8-2a</td>
</tr>
<tr>
<td>V10 FROM MON 1 FOR DOCK, UNDOCK</td>
<td>8-2b</td>
</tr>
<tr>
<td>V10 FROM MON 2</td>
<td>8-3</td>
</tr>
<tr>
<td>RWS V10 FROM MON 1</td>
<td>8-4</td>
</tr>
<tr>
<td>RWS V10 FROM DTV</td>
<td>8-5</td>
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<td>SPECIFICATIONS</td>
<td>8-6</td>
</tr>
<tr>
<td>NOMENCLATURE</td>
<td>8-7</td>
</tr>
<tr>
<td>MENU SETTINGS</td>
<td>8-9</td>
</tr>
<tr>
<td>V10 TO V10 VIA FIREWIRE</td>
<td>8-10</td>
</tr>
</tbody>
</table>
SONY V10

V10 FROM MON 1

Config H/W per dwg below

AVIU

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

O19

√TV PWR – ON

V10

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

FOR A31p AS MON
Perform A31p VIDEO CONVERTER (PHOTO/TV, PORTABLE MONITORS)
SONY V10 (Continued)

V10 FROM MON 1 FOR DOCK, UNDOCK

Config H/W per dwg below

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

O19, MO58F
- TV PWR – ON

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

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

<table>
<thead>
<tr>
<th>J1</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
</tr>
</thead>
<tbody>
<tr>
<td>MON 1</td>
<td>Video Monitor to VIU/CM Cable (SED39122074-303)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>FLT DECK (O19)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>A31p Video Adapter (SEG33115372-301)</td>
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<tr>
<td>A31p</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TV PWR Cable (20 ft) (2293284–503, 528–20650–3)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J1</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLT DECK (O19)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>WVS 2</td>
<td>V10</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TV PWR Cable (20 ft) (2293284–503, 528–20650–3)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>J1</th>
<th>J2</th>
<th>J3</th>
<th>J4</th>
<th>J5</th>
<th>J6</th>
<th>J7</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLT DECK (O19)</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>A31p</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV PWR Cable (20 ft) (2293284–503, 528–20650–3)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Digital CC Vid/Pwr Cable (SED39111490-303)
SONY V10 (Continued)

V10 FROM MON 2

Config H/W per dwg below

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

O19
√ TV PWR – ON

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

R12
VPU PWR – ON (LED on)
SONY V10 (Continued)

RWS V10 FROM MON 1

Config H/W per dwg at right

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

V10 PWR – ON

In Lab
Connects to Dual Canon Li-ION Batt Charger Assy pwr'd from UOP

Digital CC Vid/Pwr Cable (SED33111480-303)

Labeled here as:
RWS #1 Drag-Thru Cable

Labeled here as:
RWS #1 Drag-Thru Cable

Video

Monitor to AVIU Cable (SED39122074-303)

Balanced Video Cable (SED33105778-301)

VIU LCD Cable (SED39122260-320)

NOTE
Only extreme ends of prerouted RWS Drag-Thru Cable have crew-preference labels
SONY V10 (Continued)

RWS V10 FROM DTV

Config H/W per dwg at right

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

V10 PWR – ON
SONY V10 (Continued)

SPECIFICATIONS

- TAPE: Mini DVCAM Cassette
- TAPE LENGTH: 40 min
- CD: Color, 5.5 in
- AUDIO: 16 bit at 48 KHz
- PWR: 7.2V Batt
- 8.4V DC IN
- BATT LIFETIME: ~60 min w/LCD closed
- ~30 min w/LCD open
- BODY WEIGHT: 2.00 lb
- BATT WEIGHT: 0.41 lb
SONY V10 (Continued)

NOMENCLATURE

1. REC ORG TC Lamp
2. REC ORG TC pb
3. TC Reset pb
4. DISPLAY pb
5. AUDIO DUB pb
6. REC (recording) pb and Lamp
7. SLOW pb
8. PAUSE pb
9. PLAY (playback) pb
10. FF (fast Forward) pb
11. STOP pb
12. REW (rewind) pb
13. LCD Screen
14. POWER sw
15. MENU pb, Control dial
16. AUDIO Input/Output Jacks (R,L)
17. RFU DC OUT Jack
18. VIDEO Input/Output Jack
19. S VIDEO Input/Output Jack
20. LCD BRIGHT pb
21. Speaker
22. Volume pb
23. Headphone Jack
24. EJECT sw
25. Remote Sensor
26. Power Lamp
SONY V10 (Continued)

NOMENCLATURE (Concluded)

1. PUSH OPEN pb
2. EDITOR COVER RELEASE
3. DV IN/OUT Jack
4. BATT Release
5. Batt Adapter
SONY V10 (Continued)

MENU SETTINGS

CMD – VTR4
HiFi SOUND – STEREO
AUDIO MODE – FS48K
TIME CODE – DF
BEEP – ON
AUDIO MIX – “left” (ST1)
CM SEARCH – ON
DATA CODE – DATE/CAM
LCD COLOR – “center”
LCD HUE – “center”
DISPLAY – LCD
JOG AUDIO – OFF
CLOCK SET – set to GMT
SONY V10 (Concluded)

V10 TO V10 VIA FIREWIRE

Config H/W per dwg at right

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

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

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

Perform following for each video segment:

PLBK V10
PAUSE pb – push (To PLAY)
RCD V10
PAUSE pb – push (To REC)

When EDIT segment complete:

PLBK V10
PAUSE pb – push (PAUSE)
RCD V10
PAUSE pb – push (PAUSE)
<table>
<thead>
<tr>
<th>PORTABLE MONITORS</th>
<th>PAGE</th>
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<tr>
<td>A31p VIDEO CONVERTER</td>
<td>9-4</td>
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<tr>
<td>SONY LCD SPECIFICATIONS</td>
<td>9-6</td>
</tr>
<tr>
<td>SONY LCD NOMENCLATURE</td>
<td>9-6</td>
</tr>
<tr>
<td>VPU REPEATER</td>
<td>9-7</td>
</tr>
</tbody>
</table>
PORTABLE MONITORS

PGSC VIDEO OVERLAY

PGSC

1. √PGSC Pwr – ON

2. Connect VID IN/OUT Cable to PGSC VID IN port
   (i.e., port w/Camr symbol next to Pwr port)

3. Connect appropriate hardware from video source to VID IN/OUT Cable depending on desired video source per table below

<table>
<thead>
<tr>
<th>Video Source</th>
<th>Hardware (part #)</th>
<th>From</th>
<th>To</th>
<th>Cable Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYLOAD/DTV</td>
<td>•AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>L10A1 VTR OUT</td>
<td>Vid In/Out cbl</td>
<td>•BNC - RCA</td>
</tr>
<tr>
<td>Monitor 1(2) (option 1)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303)</td>
<td>•AVIU (SED33111493-302/303)</td>
<td>•AVIU Video Cable Assy (SEZ33114239-301)</td>
<td>Mon/J3</td>
</tr>
<tr>
<td>Monitor 1(2) (option 2)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303)</td>
<td>•AVIU (SED33111493-302/303)</td>
<td>•Balanced Video Cable (SED39124190-301)</td>
<td>•Bal/Unbal Xfmr (SED39124190-301)</td>
</tr>
<tr>
<td>Monitor 1(2) (option 3)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303)</td>
<td>•AVIU (SED33111493-302/303)</td>
<td>•AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>Mon/J3</td>
</tr>
<tr>
<td>Monitor 1(2) (option 4)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303)</td>
<td>•Bal/Unbal Xfmr (SED39124190-301)</td>
<td>•AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>Mon/J3</td>
</tr>
</tbody>
</table>
PORTABLE MONITORS (Continued)

PGSC VIDEO OVERLAY (Concluded)

<table>
<thead>
<tr>
<th>Video Source</th>
<th>Hardware (part #)</th>
<th>From</th>
<th>To</th>
<th>Cable Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISS</strong></td>
<td>• VPU Patch Cable (SED39136025-301)</td>
<td>• VPU FROM ISS</td>
<td>• Bal/Unbal Xfmr</td>
<td>• Plug - Twinax</td>
</tr>
<tr>
<td></td>
<td>• Bal/Unbal Xfmr (SED39124190-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Spare 1 (SSV)</strong></td>
<td>• SSV to PDIP/CIP Cable (SED16103246-301)</td>
<td>• L11A2 PDIP/J107</td>
<td>• Bal/Unbal Xfmr</td>
<td>• Circ - Twinax</td>
</tr>
<tr>
<td></td>
<td>• Bal/Unbal Xfmr (SED39124190-301)</td>
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<tr>
<td></td>
<td>• AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WVS</strong></td>
<td>• AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>• R12A2 WIB XCVR1(2)</td>
<td>• Vid In/Out cbl</td>
<td>• BNC - RCA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UNBAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PD100 Camc</strong></td>
<td>• PD100 A/V Adapter Cable (SEZ16103275-301)</td>
<td>• PD100 A/V port</td>
<td>• RCA-RCA cbl (via</td>
<td>• Stereo - RCA</td>
</tr>
<tr>
<td>(option 1)</td>
<td></td>
<td></td>
<td>female adapter)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RCA - RCA Cable (SED39122260-314)</td>
<td>• A/V adapter</td>
<td>• Vid In/Out cbl</td>
<td></td>
</tr>
<tr>
<td><strong>PD100 Camc</strong></td>
<td>• Y-C Cable (SED33104816-301)</td>
<td>• PD100 S-Video port</td>
<td>• Vid In/Out cbl</td>
<td>• S-Video - S-Video</td>
</tr>
<tr>
<td>(option 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Configure video source

5. Double-click Shuttle Apps > Video Overlay

6. √ Video overlay displayed

* If image not displayed on PGSC:
  * Press ‘S’
  * √ ‘VIDEO’ selected
  * Sel OK

![Diagram](image.png)
PORTABLE MONITORS (Continued)

A31p VIDEO CONVERTER

A31p

1. √A31p Pwr – ON

2. Connect A31p Video Adapter to A31p VID IN “-S-”

3. Connect appropriate hardware from video source to A31p Video Adapter Cable depending on desired video source per table below:

<table>
<thead>
<tr>
<th>Video Source</th>
<th>Hardware (part #)</th>
<th>From</th>
<th>To</th>
<th>Cable Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYLOAD/DTV</td>
<td>•AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>•L10A1 VTR OUT</td>
<td>•A31p Video Adapter</td>
<td>•BNC - RCA</td>
</tr>
<tr>
<td>Monitor 1(2) (option 1)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU Video Cable Assy (SEZ33114239-301)</td>
<td>•Mon/J3</td>
<td>•AVIU/J4</td>
<td>•Circ - Twinax</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor 1(2) (option 2)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •Balanced Video Cable (SED33105778-301) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>•Mon/J3</td>
<td>•AVIU/J4</td>
<td>•Circ - Twinax</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor 1(2) (option 3)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •AVIU (SED33111493-302/303) •AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>•Mon/J3</td>
<td>•AVIU/J4</td>
<td>•Circ - Twinax</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor 1(2) (option 4)</td>
<td>•Monitor to AVIU/CM Cable (20ft) (SED39122074-303) •Bal/Unbal Xfmr (SED39124190-301) •AVIU-CC Video Cable (15ft) (SED39122269-301)</td>
<td>•Mon/J3</td>
<td>•AVIU/J4</td>
<td>•Circ - Twinax</td>
</tr>
</tbody>
</table>

...
### PORTABLE MONITORS (Continued)

#### A31p VIDEO CONVERTER (Concluded)

<table>
<thead>
<tr>
<th>Video Source</th>
<th>Hardware (part #)</th>
<th>From</th>
<th>To</th>
<th>Cable Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISS</td>
<td>•VPU Patch Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SED39136025-301)</td>
<td></td>
<td></td>
<td>•Bal/Unbal Xfmr</td>
</tr>
<tr>
<td></td>
<td>•Bal/Unbal Xfmr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SED39124190-301)</td>
<td></td>
<td></td>
<td>•A31p Video Adapter</td>
</tr>
<tr>
<td></td>
<td>•AVIU-CC Video Cable (15ft)</td>
<td></td>
<td></td>
<td>•BNC - RCA</td>
</tr>
<tr>
<td></td>
<td>(SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spare 1 (SSV)</td>
<td>•SSV to PDIP/CIP Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SED16103246-301)</td>
<td></td>
<td></td>
<td>•Bal/Unbal Xfmr</td>
</tr>
<tr>
<td></td>
<td>•Bal/Unbal Xfmr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SED39124190-301)</td>
<td></td>
<td></td>
<td>•A31p Video Adapter</td>
</tr>
<tr>
<td></td>
<td>•AVIU-CC Video Cable (15ft)</td>
<td></td>
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<td></td>
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<td></td>
<td>(SED39122269-301)</td>
<td></td>
<td></td>
<td>•BNC - RCA</td>
</tr>
<tr>
<td></td>
<td>•L11A2 PDIP/J107</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WVS</td>
<td>•AVIU-CC Video Cable (15ft)</td>
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<td></td>
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<td>•A31p Video Adapter</td>
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<tr>
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<td>PD100 Camc</td>
<td>•PD100 A/V Adapter Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(option 1)</td>
<td>(SEZ16103275-301)</td>
<td></td>
<td></td>
<td>•RCA-RCA cbl (via female adapter)</td>
</tr>
<tr>
<td></td>
<td>•RCA - RCA Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SED39122260-314)</td>
<td></td>
<td></td>
<td>•S-Video - S-Video</td>
</tr>
<tr>
<td>PD100 Camc</td>
<td>•Y-C Cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(option 2)</td>
<td>(SED33104816-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Configure H/W per dwg at right
5. Double-click Shuttle Apps > Video Overlay
6. √’Video Converter’ window displayed
7. Sel ‘Local Full Screen’
   Press ‘ESC’ or ‘W’ key to minimize display as reqd
PORTABLE MONITORS (Continued)

SONY LCD SPECIFICATIONS

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

SONY LCD NOMENCLATURE

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
PORTABLE MONITORS (Concluded)

VPU REPEATER

![Diagram of VPU Repeater and Video Processing Unit Connections]

- VPU Patch Cable (SED39136025-301)
- Balanced Video Cable (SED33105778-301)
- VIU/CM-CC Cable (15 ft) (SED39122269-301)
- Video IN/OUT Cable (ZE39131213–301)
This Page Intentionally Blank
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECIFICATIONS</td>
<td>10-2</td>
</tr>
<tr>
<td>LENS DATA</td>
<td>10-3</td>
</tr>
<tr>
<td>ILLUMINATOR DATA</td>
<td>10-3</td>
</tr>
<tr>
<td>CCTV SYSTEM OVERVIEW</td>
<td>10-4</td>
</tr>
<tr>
<td>VPU/WIB VIDEO ROUTING OVERVIEW</td>
<td>10-5</td>
</tr>
<tr>
<td>AVIU OVERVIEW</td>
<td>10-6</td>
</tr>
<tr>
<td>TVCU</td>
<td>10-7</td>
</tr>
<tr>
<td>CAMCORDER/COMPACT PORTABLE LIGHT POWER INTERFACE (CCPI)</td>
<td>10-8</td>
</tr>
<tr>
<td>PHOTO FLOODLIGHT</td>
<td>10-9</td>
</tr>
<tr>
<td>MALS</td>
<td>10-10</td>
</tr>
<tr>
<td>10.1 NO MONITOR PICTURE/MENU</td>
<td>10-10</td>
</tr>
<tr>
<td>10.2 NO CAMR VIDEO</td>
<td>10-17</td>
</tr>
<tr>
<td>10.3 NO VTR PLAYBACK VIDEO</td>
<td>10-19</td>
</tr>
<tr>
<td>10.4 NO CAMCORDER VIDEO ON COLOR TV MONITOR</td>
<td>10-21</td>
</tr>
<tr>
<td>10.5 RMS TV cb OPENS</td>
<td>10-25</td>
</tr>
</tbody>
</table>
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

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

### ILLUMINATOR DATA

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

*Three rings of LEDs:
  - Inner, outer rings – 8° LEDs
  - Middle ring – 22° LEDs
CCTV SYSTEM OVERVIEW

Camera types:
- CTVC, IVTC
- PLB Camrs
  - A - Fwd Bay
  - B - Keel/EVA
  - C - Alt Bay
  - D - Stbd RMS Port RMS Camrs
  - Elbow
  - Wrist
- KeeV Aux Camrs
  - w/Pan/Tilt Units

PLB Camrs
- V10 Recorder
- V10
- Video Switching Unit (VUS)
- S-Band FM System
- Ku-Band System
- DTV
- Color Monitor 1
- Color Monitor 2
- V10 Recorder
- V10
- Video Processing Unit (VPU)
- Wireless Video System (WVS)
- Video Processing Unit
- Remote Control Unit (RCU)
- Test Pattern
- Sync
- PLB Camrs
- Illuminator
- PL & SH, DTOs, etc
- Keel & Mission Specific Camrs
- WVS Xcrr 1,2
- UHF ANT
- S-Band ANT 1-7
- MUX
- MUX
- AUDIO & Video
- Audio & Sync
- Video & TLM
- Video
- Camera & VSU TLM
- Sync
- Cam & VSU TLM
- Sync
- MNB
- MNB
- VWS Ctrl
- Video & TLM
- Video & TLM
- Sync
- GTM
- Audio & Sync
- Video & TLM
- Cam & VSU TLM
- Sync
- MNB
- MNB
- VWS Ctrl
- Video & TLM
- Video & TLM
- Sync
- GTM
- Audio & Sync
- Video & TLM
- Cam & VSU TLM
- Sync
- MNB
- MNB
- VWS Ctrl
- Video & TLM
- Video & TLM
- Sync
- GTM
- Audio & Sync
- Video & TLM
- Cam & VSU TLM
- Sync
- MNB
- MNB
- VWS Ctrl
- Video & TLM
- Video & TLM
- Sync
- GTM
- Audio & Sync
- Video & TLM
- Cam & VSU TLM
- Sync
- MNB
- MNB
- VWS Ctrl
- Video & TLM
- Video & TLM
- Sync
- GTM
- Audio & Sync
- Video & TLM
**AVIU OVERVIEW**

**J1**
- Unbalanced Video Input (Output)

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

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

**J4**
- Balanced Video Input

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

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

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

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

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

**HI/LO sw**
- HI – 12V output at J5
- LO – 8.4V output at J3
CCTV (Continued)

TVCU

TV CONTROLLER UNIT
P/N SED39126161–301
S/N 1001

PGSC

J6

J1

J2

J3

CAMCORDER VIDEO OUT
CAMCORDER VIDEO IN
VIDEO TO CTVM
LCD OUTPUT
PANEL 019–POWER

J4

J5

S1

CENTERLINE VIDEO/SYNC

CAMCORDER CENTERLINE VIDEO/SYNC

CENTERLINE

P AN E LO 1 9–PO WE R LCD OUTPUT

jrc48037_045.cnv
CCTV (Continued)

CAMCORDER/COMPACT PORTABLE LIGHT POWER INTERFACE (CCPI)

CONTENTS OF CCPI FUSE KIT
(P/N SED33105384–301)

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

OPERATING LIMITS
CAMCORDER ONLY – UNLIMITED
CPL ONLY – 10 MIN.
CPL + ONE CAMCORDER – 14 MIN.
CPL + TWO CAMCORDER – 11 MIN.
CCTV (Continued)
PHOTO FLOODLIGHT

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

MON 1(2) LVPS STATUS

(A3) MON 1(2)
Green LED lit?

No

Yes

2

Record current MON 1(2) Source
and Video Input Device if possible

(A3) MON 1(2) menu
Record SOURCE:

(A7U)
VID OUT MON 1(2)
(DNLK) pb – push
Record VID INPUT:

Menu visible?

Yes

No

3

Try to bring up Menu

(A3) MON 1(2)
FUNCTION – →
FUNCTION – ←

Menu visible?

Yes

No

4

Does cursor move?

Yes

No

5

Send test pattern to MON 2(1)

(A3) MON 2(1) menu
SOURCE – PNL

(A7U)
VID OUT MON 2(1) pb – push
VID IN TEST pb – push

Test pattern on MON 2(1)?

Yes

No

6

Which menu SOURCE is currently in use:

(C,D,SPLIT,RGB)

PNL

DNLK

(A3) MON 2(1) menu
SOURCE – DNLK

Picture on MON 2(1)?

No

Yes

7

8

VCU OK

22

26

10.2

1

10.3

1

10.4

1

1

2

LVPS = low voltage pwr supply

Current SOURCE and INPUT recorded here will be used in subsequent mal blocks
10.1  (Cont)

3

4

5

6

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 pwrd 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

9 Try MON 2(1) PNL SOURCE

(A3) MON 2(1) menu
• SOURCE – PNL

(A7U)
• VID OUT MON 2(1) pb – push
• VID IN INPUT pb – push

Selected picture on MON 2(1)?

Yes

No

10 Send test pattern to MON 1(2)

(A3) MON 1(2) menu
• SOURCE – PNL

(A7U)
• VID OUT MON 1(2) pb – push
• VID IN TEST pb – push

Test pattern on MON 1(2)?

Yes

No

11 Try MON 1(2) PNL SOURCE

(A3) MON 1(2) menu
• SOURCE – PNL

(A7U)
• TV SYNC – REVERSE
• VID OUT MON 1(2) pb – push
• VID IN TEST pb – push

Test pattern on MON 1(2)?

Yes

No

12 Switch SYNC generators

(A7U)
• TV PWR CNTL – PNL
• TV PWR CONTR UNIT – MNB(MNA)
• Wait 10 sec
• VID OUT MON 1(2) pb – push
• VID IN TEST pb – push

Test pattern on MON 1(2)?

Yes

No

13 Try other VCU pwr source

(A7U)
• FAILED PWR RELAY OR RELAY DRIVER IN RCU

14 VIDEO INPUT DEVICE OR VSU INPUT FAILURE

15 SYNC GEN FAILURE

16 Continue on SYNC REVERSE

17 Which Video device used for input:

STANDARD ORBITER CCTV CAMR (NOT CAMCORDER)

CAMCORDER

ORBITER VTR

18 FAILED PWR RELAY OR RELAY DRIVER IN RCU

20 Continue nominal ops on MNB(MNA)

21 MCC

19 VCU FAILURE: LOSS OF ALL TV

22

08/12/04  10-11  P/TV/115/FIN
Brightness and contrast controls may need to be adjusted to see menu.

SOURCE is the source recorded in block 2.

22. Try to bring up menu on MON 1(2).

(A3)
MON 1(2)
- PWR – OFF
- Wait 10 sec
- PWR – ON

Menu on screen?

23. Move menu cursor.

(A3)
MON 1(2)
- FUNCTION – ←
- Function – →

Menu cursor moved?

24. MON 1(2) CRT OR DISPLAY CIRCUITS FAILED.
MON 1(2) LOST OR LIMITED CAPABILITIES

25. MON 1(2) CONTROL LOGIC FAILURE. MON 1(2) LOST

26. Attempt LVPS protection circuit reset

(A3)
MON 1(2)
- PWR – OFF
- Wait 10 sec
- PWR – ON

MON 1(2) LED lit?

27. Use MON 2(1)

28. Reselect original source

(A3)
MON 1(2)
- SOURCE – SOURCE

Picture on MON 1(2)?

29. Use MON 2(1)

30. MON 1(2) LVPS FAILURE.
MON 1(2) LOST

31. TRANSIENT MON 1(2) LVPS PROTECTION CIRCUIT TRIP

32. MON 1(2) TRANSIENT FAILURE

33. MON 1(2) recovered

34. Picture on MON 1(2)?

35. Menu on screen?

36. MON 1(2) recovered

37. MON 1(2) CRT OR DISPLAY CIRCUITS FAILED.
MON 1(2) LOST

38. Use MON 2(1)
**CCTV 10.1 (Cont)**

39 Try another input for DNK

(A7U)
- VID OUT DNK pb – push
- VID IN TEST pb – push

Test pattern on MON 1(2)?

Yes

40 Try original input to MON 1(2)

PNL SOURCE

(A7U)
- VID OUT MON 1(2) pb – push
- VID IN INPUT pb – push

(A3)
MON 1(2) menu
- SOURCE – PNL

Picture on MON 1(2)?

No

41 VIDEO INPUT DEVICE OR VSU INPUT FAILURE

Yes

42 INPUT Y TO DNK CROSSPOINT FAILED IN VSU

(A7U)
- VID OUT MON 1(2) pb – push
- VID IN TEST pb – push

Test pattern on MON 1(2)?

No

43 Select PNL SOURCE for MON 1(2)

(A3)
MON 1(2) menu
- SOURCE – PNL

(A7U)
- VID OUT MON 1(2) pb – push
- VID IN TEST pb – push

Yes

44 Which Video device used for input:

- STANDARD ORBITER CCTV CAMR (NOT CAMCORDER)
  - MON 1(2) SIGNAL PROCESSING CIRCUIT FAILURE. MON 1(2) LOST
  - MON 1(2) DNLK INPUT OR VSU MON 1(2) DNLK OUTPUT LOST
  - Continue MON 1(2) ops on other sources

继续 nominal ops with other inputs for dnlk

(A3)
MON 1(2) menu
- MODE – AUTO

No

45 Continue MON 1(2) ops on other sources

(A3)
MON 1(2) menu
- MODE – AUTO

46 MON 1(2)

47 MON 1(2)

DNLK INPUT OR VSU MON 1(2) DNLK OUTPUT LOST

48 Use MON 2(1)

49 MON 1(2) ops on other sources

(A3)
MON 1(2) menu
- MODE – AUTO

50 Continue nominal ops with other inputs for dnlk

(A3)
MON 1(2) menu
- MODE – AUTO

51 MON 1(2) SIGNAL PROCESSING CIRCUIT FAILURE. MON 1(2) LOST

52 DNLK INPUT OR VSU MON 1(2) DNLK OUTPUT LOST

53 Continue MON 1(2) ops on other sources

(A3)
MON 1(2) menu
- MODE – AUTO

54 MON 1(2) SIGNAL PROCESSING CIRCUIT FAILURE. MON 1(2) LOST

(A3)
MON 1(2) menu
- MODE – AUTO

55
SOURCE is the source recorded in block 2.

Picture will be B&W with possible flicker.
If DNLK in progress, selecting test pattern to DNLK not reqd. MCC will advise on DNLK status.
Recovery of video source device may be possible

Inputs C,D may be useable without SPLIT
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
- cb MNC TV CAB – 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
- MODE – AUTO
- GUNS – R,G,B – ON

1. Send test pattern to MON 1(2)
   - (A3) MON 1(2) menu SOURCE – PNL
   - (A7U) VID OUT MON 1(2) pb – push
   - VID IN TEST pb – push

   Test pattern on MON 1(2)?

   Location of affected Camr:
   - CABIN – Camcorder
   - CABIN – Standard orbiter CCTV Camr (not Camcorder)

3. Cycle MIDDECK (FLT DECK) Camr pwr
   - (MO58F(O19)) TV PWR – OFF
   - Wait 10 sec
   - TV PWR – ON
   - (A7U) VID OUT MON 1(2) pb – push
   - VID IN MIDDECK (FLT DECK) pb – push
   - CAMR CMD ALC pb – press
   - CAMR CMD AVG pb – press

Picture on MON 1(2)?

4. Cycle Camr pwr
   - (A7U) (Aff Camr) TV CAMR PWR – OFF
   - Wait 10 sec
   - (Aff Camr) TV CAMR PWR – ON
   - VID OUT MON 1(2) pb – push
   - VID IN (Aff Camr) pb – push
   - CAMR CMD ALC pb – press
   - CAMR CMD AVG pb – press

Picture on MON 1(2)?

5. Cycle RMS Camr pwr
   - (A7U) TV CAMR PWR RMS – OFF
   - Wait 10 sec
   - TV CAMR PWR RMS – ON
   - VID OUT MON 1(2) pb – push
   - VID IN (PORT) RMS pb – push
   - CAMR CMD ALC pb – press
   - CAMR CMD AVG pb – press

Picture on MON 1(2)?

6. CAMR LOST

7. ALC LOGIC LOCKUP IN AFFECTED CAMR
   - (A3) MON 1(2) SOURCE – as reqd
   - SYNC – INT
   - MODE – AUTO
   - GUNS – R,G,B – ON

Yes No

Continue nominal ops
If currently selected to WRIST(ELBOW) then select ELBOW (WRIST)

9 Try alternate TV cable
(A7U)
  • VID OUT MON 1(2) pb – push
  • VID IN MIDDECK (FLT DECK) pb – push
(M058F(O19))
  • TV PWR – OFF
  • Replace Camr cable
  • TV PWR – ON
(On Camr)
  • ALC - AVG

Picture on MON 1(2)?

Yes

No

15 Try alternate TV pnl
(M058F(O19))
  (original pnl)
  • TV PWR – OFF
  • Disconnect TV Cable at pnl
(O19(M058F))
  (new pnl)
  • TV PWR – ON
  • Connect cable
(On Camr)
  • ALC - AVG

(A7U)
  • VID OUT MON 1(2) pb – push
  • VID IN FLT DECK (MIDDECK) pb – push

Picture on MON 1(2)?

Yes

No

18 ORIGINAL TV PANEL FAILURE

10 Switch to alternate RMS Camr
(A7U)
  • RMS CAMR PORT – ELBOW(WRIST)
  • Wait 10 sec
  • CAMR CMD ALC pb – press
  • CAMR CMD AVG pb – press

Picture on MON 1(2)?

Yes

No

11 RMS WRIST(ELBOW) CAMR FAILURE

13 RMS REMOTE VIDEO SWITCHER FAILURE OR VSU RMS INPUT FAILURE

14 RMS ELBOW(WRIST) Camr functional

16 Both RMS Camrs unusable

17 Try alternate Camr
(O19(M058F))
  • TV PWR – OFF
  • Connect alternate Camr
  • TV PWR – ON
(On Camr)
  • ALC - AVG

Picture on MON 1(2)?

Yes

No

19 TV CAMR FAILURE

20 INDEPENDENT DOUBLE FAILURE

12 CAMR CABLE FAILURE

14 ORIGINAL TV PANEL FAILURE

19 TV CAMR FAILURE

20 INDEPENDENT DOUBLE FAILURE
1. Replacement tape should have good video recorded on it
2. V10 requires dump thru pnl O19(MO58F)
3. √MCC if alternate equip avail
4. IFM for AVIU(cables) may be possible
3 MCC if alternate equip avail
4 IFM for AVIU(cables) may be possible

9 Try alternate PIGMY Cable
   (V10)
   • STOP pb – press
   (O19(MO58F))
   • TV PWR – OFF
   • Replace PIGMY Cable
   • TV PWR – ON
   (V10)
   • PLAY pb – press
   Picture on MON 1(2)?

10 ORIGINAL PIGMY CABLE VID/SYNC/PWR LEG FAILURE

11 • Continue ops on alternate PIGMY Cable

12 Try alternate TV pnl
   (O19(MO58F)) (original pnl)
   • TV PWR – OFF
   • Disconnect TV Cable (PIGMY Cable) at pnl
   (MO58F(O19)) (new pnl)
   • TV PWR – OFF
   • Connect cable
   • TV PWR – ON
   (A7U)
   • VID OUT MON 1(2) pb – push
   • VID IN MIDDECK (FLT DECK) pb – push
   Picture on MON 1(2)?

13 • MCC

14 V10 FAILURE

15 ORIGINAL TV PNL FAILURE

16 • Continue ops using alternate TV pnl
10.4 NO CAMCORDER VIDEO ON COLOR TV MONITOR

1. Send test pattern to MON 1(2)
   (A3) MON 1(2) menu
   • SOURCE – PNL
   (A7U)
   • VID OUT MON 1(2) pb – push
   • VID IN TEST pb – push
   Test pattern on MON 1(2)
   No 10.1
   Yes

2. Cycle Camcorder pwr
   • MODE – OFF
   • Wait 10 sec
   • MODE – CAMERA
   • Config as reqd

3. Send Camcorder video to MON 1(2)
   (A7U)
   • VID OUT MON 1(2) pb – push
   • VID IN FLT DECK (MIDDECK) pb – push
   Picture on MON 1(2)?
   Yes
   No

4. TRANSIENT CAMCORDER FAILURE
   Yes
   No

5. Continue normal ops

6. Picture in Camcorder Viewfinder/LCD?
   Yes
   No

7. AVIU OR CABLE FAILURE
   22
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.

8 Camcorder on batteries?

9 Change out Camcorder Battery Pack
   (A7U)
   • VID OUT MON 1(2) pb – push
   • VID IN MIDDECK (FLT DECK) pb – push
   (PD100)
   • MODE – OFF
   • Replace Battery Pack
   • MODE – CAMERA

10 Try powering Camcorder w/orbiter pwr
   (A7U)
   • VID OUT MON 1(2) pb – push
   • VID IN MIDDECK (FLT DECK) pb – push
   (PD100)
   • MODE – OFF
   • Remove Battery Pack
   • MODE – CAMERA

11 Try powering Camcorder w/Battery Pack
   (MO58F(O19))
   • TV PWR – OFF
   (PD100)
   • MODE – OFF
   • Remove Digital CC Vid/Pwr Cable
   • Install Battery Pack
   • MODE – CAMERA
   Camcorder viewfinder/LCD?

12 ORIGINAL BATTERY PACK DEAD

13 Continue ops on alternate battery pack

14 CAMCORDER FAILURE. CAMCORDER NOT USEABLE

15 Camcorder can be used w/Batteries. If orbiter pwr desired, continue troubleshooting to isolate problem

16 CAMCORDER FAILURE. CAMCORDER NOT USEABLE

17 BATTERY PACK DEAD

18 Try to pw power other devices from MO58F(O19)
   (MO58F(O19))
   • TV PWR – ON

19 Continue ops on orbiter pwr or try remaining Batteries

20

21

22

23

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No
25

Yes

35 Try alternate AVIU
(A7U)
- VID OUT MON 1(2) pb – push
- VID IN MIDDECK (FLT DECK) pb – push

(PD100)
- MODE – OFF
(MO58F(O19))
- TV PWR – OFF
- Replace AVIU
- TV PWR – ON

(PD100)
- MODE – CAMERA
Picture on MON 1(2)?

No

36 ORIGINAL AVIU FAILURE

37 Try alternate Digital CC VID/PWR Cable
(A7U)
- VID OUT MON 1(2) pb – push
- VID IN MIDDECK (FLT DECK) pb – push

(PD100)
- MODE – OFF
(MO58F(O19))
- TV PWR – OFF
- Replace Digital CC Vid/Pwr Cable
- TV PWR – ON

(PD100)
- MODE – CAMERA
Picture on MON 1(2)?

Yes

38 Continue ops on alternate AVIU

39 •√MCC

No

40 CAMCORDER VIDEO PORT FAILURE

41 ORIGINAL DIGITAL CC VID/PWR CABLE FAILURE

42 • Use alternate Camcorder if video output reqd

43 •√MCC

3

2 MCC if alternate equip not avail

3 IFM for AVIU or cables may be possible
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.
9. (A7U)
- TV CAMR PWR RMS – ON
- CAMR CMD ALC pb – PEAK

Video on Monitor and cb closed?

No

8

11. Wrist Camr work in block 3?

No

Yes

12. Select Wrist Camr

(A7U)
- PORT RMS CAMR – WRIST

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

(A7U)
- CAMR CMD ALC pb – press
- CAMR CMD PEAK pb – press

Video on Monitor and cb closed?

No

13. WIRING
- FAILURE OR
- CAMR PWR
- RELAY FROZEN.
- BOTH RMS
- CAMRS LOST

Yes

14. WRIST CAMR
- OPERATIONAL. ELBOW CAMR FAILED

15.
- Do not use Elbow Camr

10. Elbow Camr operational
CENTERLINE (C/L) CAMR

C/L CAMR INSTALL

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

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

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

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

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

C/L Camr √SSF/STS sw – STS

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

C/L CAMR
C/L CAMR INSTALL (Continued)

2. Camr Position Verification

---

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

NOTE
This view in ODS looking up from Camr bottom
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR INSTALL (Concluded)

3. **ODS C/L Camr Alignment Check**
   Perform ACTIVATION (Cue Card, TV) as reqd

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

MON 1(2)
LDATA – ON
CDATA – GRN
XHAIR – GRN

A7
Zoom to 10° ± 0.5°
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
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR VIDEO TROUBLESHOOT

1. √C/L Camr nominal config:
   ODS   √ Camr SSF/STS sw – STS
       SEC C/L Camr connected via PRI C/L TV Camr Harness Assy to TV2 port
   R12 (VPU)   √ VPU SEC C/L Cap installed on SEC C/L
       √ Green Jumper – SEC C/L
       √ VPU PWR – ON (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:
   √ CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF, wait 10 sec, SEC ON
   A7   ALC pb – push
        AVG pb – push
   A3 (MON)   √ C/L Camr Video
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR VIDEO TROUBLESHOOT (Continued)

If still no C/L Camr video on monitor:

3. Change ODS TV port:
   A7   CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF
   ODS   Disconnect PRI C/L TV Camr Harness Assy from TV2 port
   Connect PRI C/L TV Camr Harness Assy to TV1 port
   R12 (VPU)   √VPU SEC C/L Cap installed on PRI C/L
   Green Jumper – PRI C/L
   L12 (SSP 2)   C/L CAM PWR – PRI ON
   A7   ALC pb – push
   AVG pb – push
   A3 (MON)   √C/L Camr Video

If still no C/L Camr video on monitor:

4. Change C/L TV Camr Harness Assy:
   A7   CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF
   ML60M   Unstow B/U C/L TV Camr Harness Assy
   ODS   Disconnect PRI C/L TV Camr Harness Assy from ODS TV1 port and PRI C/L Camr
   Connect B/U C/L TV Camr Harness Assy to ODS TV1 and PRI C/L Camr
   L12 (SSP 2)   C/L CAM PWR – PRI ON
   A7   ALC pb – push
   AVG pb – push
   A3 (MON)   √C/L Camr Video
If still no C/L Camr video on monitor:

5. Install B/U C/L Camr:
   A7   CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF
   ML60M   Unstow B/U C/L TV Camr
   ODS   Disconnect B/U C/L TV Camr Harness Assy from PRI C/L Camr
   Remove PRI C/L Camr from ODS C/L Camr Brkt
   Mount B/U C/L Camr to ODS C/L Camr Brkt
   Connect B/U C/L TV Camr Harness Assy to B/U C/L Camr
   L12 (SSP 2)   C/L CAM PWR – PRI ON
   A7   ALC pb – push
   AVG pb – push
   A3 (MON)   √ C/L Camr Video

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

If still no C/L Camr video on monitor:

6. √MCC
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR MISALIGNMENT

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

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

Perform each of the remaining steps if misalignment persists:

3. Remove, re-install mounting bridge to ODS. Recheck alignment per C/L CAMR INSTALL, step 3
4. Shim Camr/bridge interface:
   a. Obtain feeler gauges from ML60B Primary C/L Foam
   b. Loosen fasteners on Camr/bridge interface
   c. Insert feeler gauge between Camr brkt and bridge as appropriate to center x-hair and tighten fasteners
   d. Recheck alignment per C/L CAMR INSTALL, step 3
   e. Repeat as req’d w/different sized feeler gauges or shim locations until x-hair within target circle

ML60M 5. Install SEC C/L Camr using PRI C/L Camr Harness Assy and ODS TV Port 2 (no change to VPU selections):
   A7   CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF
   ODS   Disconnect Camr Harness Assy from PRI C/L Camr
         Replace PRI C/L Camr w/SEC C/L Camr
         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) req'd
CENTERLINE (C/L) CAMR (Continued)

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

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

   A3 \[\sqrt{\text{MON 2 PWR – OFF}}\]
   R14:D \[\text{cb MNB TV MON 2 – op}\]
   A3 \[\text{Disconnect Pwr MNB from MON 2 J1}\]
   Config per dwg, 11-11

2. **Activation**
   - TVCU CENTERLINE/CAMCORDER sw – CENTERLINE O19
   - TV Pwr – ON
   - L12 (SSP 2) C/L CAM PWR – SEC ON
   - PGSC PWR SOURCE – ON
   - PGSC – ON
   - R14:D \[\text{cb MNB TV MON 2 – cl}\]
   - A3 MON 2 PWR – ON
   - V10 PWR – ON (LED on)
   - LCD PWR – ON
   - PGSC RUN TV CONTROLLER program
     - SHUTTLE Aps (double-click)
     - TV Controller (double-click)
     - Sel ‘YES’ in dialog box
     - CTVC CONTROLLER menu
       - CAMERA (click)
       - P2 (click)
       - ALC – AVG (click)
     - Return to P/TV scene as reqd
     - CTVC CONTROLLER menu
       - \[\sqrt{\text{Zoom,Iris,Focus as reqd}}\]
CENTERLINE (C/L) CAMR (Concluded)

C/L CAMR OPS FOR VSU FAIL (Concluded)

3. Deactivation

PGSC
  CTVC CONTROLLER menu
  IRIS – CLOSE
  QUIT

    PGSC – OFF
    PGSC Pwr Source – OFF

L12 (SSP 2)  C/L CAM PWR – OFF

O19  TV Pwr – OFF

LCD  PWR – OFF

MON 2  Pwr – OFF

Stow hardware as reqd
**DTV**

**SETUP**

1. **Config Panels**
   - Config H/W per dwg at right

   **L10 (MUX)**
   - VTR/CC PWR – on (LED on)
   - If dnlk:
     - MUX/VTR/CC PWR – on (LED on)
     - MUX BYPASS – ACT

   **(VIP)**
   - ATU – REC
   - CCTV VIDEO IN – J3
   - PWR – on (LED on, DATA Flow LED flashes twice)

   **(VTR)**
   - ON/STANDBY LED – green
   - TIMER – OFF
   - KEY INH – OFF
   - CHARACTER DISPLAY (LCD) – ON (not BLACK BACK)
   - CHARACTER DISPLAY – OFF
   - INPUT SELECT – VIDEO
   - COUNTER SELECT – COUNTER (TC)
   - AUDIO INPUT – FIX

   - Tape installed (Tape icon LED on)

2. **Config Video**
   - SOURCE – C

3. **Config Audio**
   - PS AUD PWR – AUD
   - Desired Loops – RCV, Vol tw-5
   - Other Loops – OFF
DTV (Continued)

SPECIFICATIONS

VIP
- PWR SOURCE: 400 Hz A/C via AC2 PAYLOAD 3Φ (MA73C:E)
- PWR DRAW: 6.84 Watts
- FUSES: F1 = 5 amp
  F2 = 2 amp
- WEIGHT: 4.19 lb
- DIMENSION: 10.5” (L) X 5.25” (W) X 2.69” (H)

VTR (SONY DSR-25)
- PWR SOURCE: 13.2 VDC via MUX
- PWR DRAW: 12.88 to 33.6 Watts (depending on mode)
- TAPE: Standard DVCAM or Mini DVCAM
- TAPE LENGTH: 3 hr or 40 min
- AUDIO: 2 Channel, 16 bit at 48 KHz
- CLOCK PWR: 300 hr internal rechargeable capacitor (after 8 hr charge)
- OPERATING TEMP: 41 degF to 104 degF
- WEIGHT: 9 lb
- DIMENSION: 15.5” (L) X 8.37” (W) X 3.87” (H)

MUX
- PWR: 28 VDC via PAYLOAD AUX bus (R1)
- PWR DRAW: 39.76 to 72.8 Watts (depending on VTR,CC config)
- FUSE: 5 amp
- WEIGHT: 15.2 lb
- DIMENSION: 19” (L) X 17.88” (W) X 3.45” (H)
DTV (Continued)

NOMENCLATURE

VIP

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
DTV (Continued)

NOMENCLATURE (Continued)

VTR (SONY DSR-25) – FRONT PANEL

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

**NOMENCLATURE (Continued)**

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PHONES jack</td>
<td>Stereo headphone connection point to monitor live(playback) audio</td>
</tr>
<tr>
<td>2</td>
<td>PHONE LEVEL kb</td>
<td>Controls headphone jack volume level</td>
</tr>
<tr>
<td>3</td>
<td>AUDIO OUTPUT SELECT sw (N/A)</td>
<td>Determines which audio channels are output in 32 kHz mode only</td>
</tr>
<tr>
<td>4</td>
<td>TIMER sw (OFF)</td>
<td>Used to auto repeat a tape or automatically start recording once pwr is applied to VTR</td>
</tr>
<tr>
<td>5</td>
<td>ON/STANDBY pb, LED (red/green)</td>
<td>Changes pwr mode of VTR between STANDBY (red LED) and ON (green LED). Will automatically go to ON when MUX pwr applied</td>
</tr>
<tr>
<td>6</td>
<td>KEY INH sw (OFF)</td>
<td>Disables all pbs when ON</td>
</tr>
<tr>
<td>7</td>
<td>Cassette Compartment</td>
<td>Tape insertion location, door opened/closed via EJECT pb</td>
</tr>
<tr>
<td>8</td>
<td>Display windows and controls</td>
<td>See 12-7 for details</td>
</tr>
<tr>
<td>9</td>
<td>EJECT pb</td>
<td>Opens/closes cassette compartment door and ejects tape, if installed</td>
</tr>
<tr>
<td>10</td>
<td>AUDIO INPUT sw (FIX)</td>
<td>Enables/disables AUDIO REC LEVEL control knobs. FIX sets fixed gain based on AUDIO INPUT LEVEL sw on rear of VTR</td>
</tr>
<tr>
<td>11</td>
<td>CH-1 AUDIO REC LEVEL kb (N/A)</td>
<td>Controls audio level of orbiter audio if AUDIO INPUT set to VAR</td>
</tr>
<tr>
<td>12</td>
<td>CH-2 AUDIO REC LEVEL kb (N/A)</td>
<td>Controls audio level for VI data if AUDIO INPUT set to VAR</td>
</tr>
<tr>
<td>13</td>
<td>DUP pb (not used)</td>
<td>Used for tape-to-tape recording to duplicate the time code</td>
</tr>
<tr>
<td>14</td>
<td>AUDIO DUB pb (N/A)</td>
<td>Used for tape-to-tape recording to duplicate the 32 kHz mode audio channels</td>
</tr>
<tr>
<td>15</td>
<td>Tape Transport Controls</td>
<td>See 12-8 for details</td>
</tr>
<tr>
<td>16</td>
<td>INPUT SELECT sw (VIDEO)</td>
<td>Determines which video input jack the VTR will process</td>
</tr>
<tr>
<td>17</td>
<td>CHARACTER DISPLAY sw</td>
<td>Determines if VTR monitor text is displayed in VTR OUT video</td>
</tr>
<tr>
<td>18</td>
<td>Monitor Display and Controls</td>
<td>See 12-9 for details</td>
</tr>
</tbody>
</table>
**NOMENCLATURE (Continued)**

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

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PAL Indicator/Amber (not used) Lit when NTSC/PAL sw is in PAL posn or PAL formatted video being processed by the VTR</td>
</tr>
<tr>
<td>2</td>
<td>NTSC Indicator/Amber (on) Lit when NTSC/PAL sw is in NTSC posn or NTSC formatted video being processed by the VTR</td>
</tr>
<tr>
<td>3</td>
<td>DVCAM Indicator/Amber (on) Lit when the VTR is playing a DVCAM-formatted tape or when the VTR is set to DVCAM</td>
</tr>
<tr>
<td>4</td>
<td>Cassette Indicator/Amber Lit solid when a tape is loaded into the VTR. Flashes during tape ejection</td>
</tr>
<tr>
<td>5</td>
<td>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</td>
</tr>
<tr>
<td>6</td>
<td>END SEARCH pb VTR will search for the last 5 sec of recorded video, play it, and return to stop mode</td>
</tr>
<tr>
<td>7</td>
<td>RESET pb Resets COUNTER displayed numbers to all zeroes</td>
</tr>
<tr>
<td>8</td>
<td>COUNTER SELECT sw Determines which time data will be displayed in the counter display</td>
</tr>
<tr>
<td></td>
<td>COUNTER Count value of the counter (DD:HH:MM:SS)</td>
</tr>
<tr>
<td></td>
<td>TC Time code</td>
</tr>
<tr>
<td></td>
<td>U-BIT User bits (not used)</td>
</tr>
<tr>
<td>9</td>
<td>Time Counter Display Displays time data (counter/time code/user bits). Self-diagnosis code numbers or error msgs</td>
</tr>
<tr>
<td>10</td>
<td>Remote Control Detector Self explanatory</td>
</tr>
</tbody>
</table>
STOP pb | Stops current tape transport operation
REW pb/Indicator/Amber | Rewinds tape and illuminates the Rew indicator. Video not visible unless held during play or play/pause mode
PLAY pb/Indicator/Green | Starts playback ops and illuminates the PLAY indicator
FF pb/Indicator/Amber | Fast forwards tape and illuminates the FF indicator. Video not visible unless held during play or play/pause mode
PAUSE pb/Indicator/Amber | Pauses playback or recording ops
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

1- STOP, 2-REW, 3-PLAY, 4-FF, 5-PAUSE, 6-REC
DTV (Continued)

NOMENCLATURE (Continued)

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LCD Monitor</td>
</tr>
<tr>
<td>2</td>
<td>CHARACTER DISPLAY (LCD) sw</td>
</tr>
<tr>
<td>3</td>
<td>DISPLAY SELECT sw</td>
</tr>
<tr>
<td></td>
<td>MENU</td>
</tr>
<tr>
<td></td>
<td>DATA</td>
</tr>
<tr>
<td></td>
<td>AUDIO</td>
</tr>
<tr>
<td>4</td>
<td>EXEC pb</td>
</tr>
<tr>
<td>5</td>
<td>↑↓ pbs</td>
</tr>
</tbody>
</table>
NOMENCLATURE (Continued)

VTR (SONY DSR-25) – REAR PANEL

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

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

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

NOMENCLATURE (Continued)

MUX – FRONT

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

VTR CLOCK SET

1. Activate VTR

R1
\sqrt{PL AUX – ON}

L10 (MUX) VTR
(VTR) \sqrt{ON/STANDBY LED – green}

2. Set VTR clock to GMT

DISPLAY SELECT – MENU
\uparrow(\downarrow) pb – ETC, EXEC pb – push
\downarrow pb – CLOCK SET, EXEC pb – push
\uparrow(\downarrow,EXEC) pb – push to set clock to GMT
\downarrow pb – RETURN, EXEC pb – push
DISPLAY SELECT – DATA

3. Deactivate VTR as reqd

ON/STANDBY – push (red LED on)

(MUX) VTR/CC – off (LED off)
DTV (Continued)

MALS

12.1 NO VIDEO AT VTR OUT

A7
✓ Video Signal routed to VID OUT DTV pb

If using CTVM:

MON 2
✓ SOURCE – C

R1
✓ PL AUX – ON

MA73C
✓ cb AC2 PL 3Φ – cl

L10 (MUX)
✓ VTR/CC(MUX/VTR/CC) PWR – on (LEDs on); if not, go to MAL 12.3

(VIP)
✓ 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

PD100
IEEE 1394 Batt Adapter Cable – Camcorder I/F

If not performing PD100 dnlk

L10 (MUX)
✓ IEEE 1394 male cable connected to IEEE 1394 port

(VTR)
DISPLAY SELECT – MENU

↑ (↓) pb – VTR, EXEC pb – push
↓ pb – DVEE OUT, ON
↓ pb – RETURN, EXEC pb – push
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)
Notifying 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 – push (red LED on)
If PD100:
PWRCAMERA

L10 (MUX)  MUX/VTR/CC PWR – off, wait 5 sec, on
(VTR)  √ON/STANDBY LED – green
If PD100:
PWRCAMERA

If no joy:
  Repeat pwrdn 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) √PWR – on
A7 √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 – push (red LED on)
(MUX) VTR/CC,MUX/VTR/CC PWR – off (LEDs off), wait 10 sec, on (LED on)
(VTR) √ON/STANDBY LED – green
√Error msg no longer displayed

If no joy, √MCC
DTV (Concluded)

MALS (Concluded)

12.11 VTR DISPLAYS ERROR MSG 21

VTR has detected moisture inside

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

12.12 VTR AUTOMATICALLY PWRS OFF

VTR Auto Off feature on

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

If no joy, √MCC
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<thead>
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<th>Section</th>
<th>Page</th>
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<td>BPSMU AUDIO/VIDEO</td>
<td>13-3</td>
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<td>13-5</td>
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<td>13-6</td>
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<td>DRAG THROUGH QD DEACTIVATION</td>
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<tr>
<td>DRAG THROUGH QD NOMENCLATURE</td>
<td>13-10</td>
</tr>
</tbody>
</table>
**BPSMU AUDIO ONLY**

1. **Set up BPSMU, Cables**
   - Connect Batt
   - Config H/W per dwg at right

2. **Config Comm System**
   - **AW18D**
     - 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
BPSMU (Continued)

BPSMU AUDIO/VIDEO

1. Set up BPSMU, Safe ODS TV Port
   BPSMU L12 (SSP2)
   Connect Batt
   C/L CAM PWR – OFF
   Config H/W per dwg at right

2. Set up PD100
   CC
   Install Sony Headset
   Install Batt
   Wide Conversion Lens installed
   Tape – Install
   Viewfinder (LCD) displays STBY
   Camr Settings
   AUTO LOCK – AUTO LOCK
   FOCUS – AUTO

3. Config TVCU
   TVCU CENTERLINE/CAMCORDER sw – CAMCORDER

BPSMU 44 ft Audio Cable
(SED16102418-325)

BPSMU 35 ft Audio Cable
(SED16102418-323)

BPSMU 4 ft Audio Cable
(SED16102418-315)

BPSMU 22 ft Audio Cable
(SED16102418-321)

BPSMU 22 ft Audio Cable
(SED16102418-312)

BPSMU 4 ft Audio Cable
(SED16102418-311)

BPSMU 22 ft Audio Cable
(SED16102418-317)

BPSMU 35 ft Audio Cable
(SED16102418-317)

BPSMU 44 ft Audio Cable
(SED16102418-317)

BPSMU 4 ft Audio Cable
(SED16102418-317)

BPSMU 22 ft Audio Cable
(SED16102418-317)

BPSMU 44 ft Audio Cable
(SED16102418-317)

BPSMU 44 ft Audio Cable
(SED16102418-317)

BPSMU 44 ft Audio Cable
(SED16102418-317)
BPSMU (Continued)

BPSMU AUDIO/VIDEO (Concluded)

4. Config TV System
   Config H/W per dwg at right
   
   **R12 (VPU)**  
   Green Jumper – SEC C/L  
   √ VPU PWR – ON (LED on)
   
   **L12 (SSP2)**  
   C/L CAM PWR – SEC ON
   
   **MON 1**  
   PWR – ON (LED on)
   
   **A7**  
   TV PWR CNTL – PNL  
   CONTR UNIT – MNA(B)  
   CNTL – CMD (wait 10 sec for system initialization)  
   VID OUT MON 1 pb – push  
   IN PL2(VPU) pb – push
   
   **MON 1**  
   √ CC video

5. Config Comm System
   
   **O9**  
   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
BPSMU (Continued)

BPSMU SPECIFICATIONS

BPSMU
- INTEGRAL CABLE LENGTH: 8 ft
- RECOMMENDED MIC POSITION: Directly in front of mouth; 6 in. from mouth
- BATT: Two 9V (pwr 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

1. Integral Cable
2. Speaker
3. ICOM pb
4. XMIT pb
5. Speaker Volume Control kb
6. Microphone (detachable)
7. Batt Compartment
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
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.


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

DRAG THROUGH QD MATING (Concluded)

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

DRAG THROUGH QD DEACTIVATION

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

DRAG THROUGH QD NOMENCLATURE

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

DRAG THROUGH QD NOMENCLATURE (Concluded)

**STATION HALF**

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)

**ORBITER HALF**

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)
MINI-CAM

IN-CABIN MINI-CAM

- Config H/W per dwg below

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

MO58F
  - √ TV PWR – ON

LCD
  - Pwr – ON (as reqd)

Mini-Cam
  - Lens – 3.5mm
  - Aperture – Adjust per LCD
MINI-CAM (Continued)

ENTRY VIDEO SETUP (Continued)

1. Config Mini-Cam, VTR for Audio Video Recording
   Config H/W per dwg, 14-3

   HUD Brkt/Cam
   Using two (2) captive screws, attach HUD Brkt to installation holes for protective cover w/HUD Brkt tab pointing up
   Attach Tie Wrap thru holes on captive screws to prevent screw from coming loose; cut off extra length on Tie Wrap
   Attach Mini-Cam Extension Cable to Mini-Cam

12mm Lens
   Focus – ∞
   Aperture – f/5.6
   Velcro Mini-Cam w/12mm lens to HUD Brkt. (Top of black Velcro on front of Camr should be at top edge of HUD Brkt.
   Only yellow Velcro should be visible above HUD Brkt)

3.5mm Lens
   Aperture – f/1.8

L10:A1
   AVIU
   SYNC/VIDEO – VIDEO
   HI-Z/75 – HI-Z
   PWR SELECT – HI

O19
   √ TV PWR – ON

PS ATU
   Config audio as reqd for entry audio

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

V10
   Install fresh batt
   PWR – ON

LCD
   Install fresh batt
   PWR – ON
MINI-CAM (Continued)

ENTRY VIDEO SETUP (Concluded)

√12mm Lens/Mini-Cam producing good video

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

<table>
<thead>
<tr>
<th>V10</th>
<th>PWR – OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD</td>
<td>PWR – OFF</td>
</tr>
<tr>
<td>L10 (VTR) (MUX)</td>
<td>ON/STANDBY – push (red LED on) VTR/CC – off (LED off)</td>
</tr>
<tr>
<td>O19</td>
<td>TV PWR – OFF</td>
</tr>
</tbody>
</table>

NOTE
TV, VTR, V10, LCD pwr will be re-enabled per ENT AFT FLT DECK CONFIG 15 (DEORB, NOMINAL DEORBIT PREP); recording will be initiated via ENTRY C/L

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

When exterior scene avail:
Focus – Adjust per V10
Aperture – Adjust per V10
If needed, turn down brightness on HUD display

Turn off V10 when not needed
MINI-CAM (Continued)

SPECIFICATIONS

CAMR DIMENSIONS: 5 1/4 in (L) X 1 in (W) X 1 3/16 in (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
AVIU VOLTAGE: 12V
WEIGHT: 1.6 lb

LENS DATA

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

BRACKET DATA

<table>
<thead>
<tr>
<th>Bracket</th>
<th>Dimensions</th>
<th>Mount Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glareshield</td>
<td>9.5 in - 10.5 in</td>
<td>Velcro w/FDF Tether</td>
</tr>
<tr>
<td>Rear Window</td>
<td>12 in - 20 in</td>
<td>Velcro w/FDF Tether</td>
</tr>
<tr>
<td>HUD</td>
<td>4.5-in base</td>
<td>Thumbscrew w/Tie Wrap</td>
</tr>
<tr>
<td></td>
<td>1.5-in extension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-in rise</td>
<td></td>
</tr>
</tbody>
</table>
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

3.5 mm Lens
6 mm Lens
12 mm Lens
23 mm Lens
## WIRELESS VIDEO SYSTEM (WVS)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
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<td>WVS INITIAL SETUP w/o ERCAs</td>
<td>15-3</td>
</tr>
<tr>
<td>WVS INITIAL SETUP w/ERCAs</td>
<td>15-7</td>
</tr>
<tr>
<td>WVS DAY-OF-EVA CHECK</td>
<td>15-12</td>
</tr>
<tr>
<td>SPECIFICATIONS</td>
<td>15-14</td>
</tr>
<tr>
<td>NOMENCLATURE</td>
<td>15-16</td>
</tr>
<tr>
<td>RF CAMR ELECTRONICS</td>
<td>15-19</td>
</tr>
<tr>
<td>WVS PLB MOUNTED H/W</td>
<td>15-20</td>
</tr>
<tr>
<td>SOFTWARE – TOP STATUS AREA</td>
<td>15-21</td>
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<tr>
<td>SOFTWARE – RF CAMR PAGE</td>
<td>15-22</td>
</tr>
<tr>
<td>SOFTWARE – XCVR PAGE</td>
<td>15-24</td>
</tr>
<tr>
<td>SOFTWARE – TELEMETRY PAGE</td>
<td>15-26</td>
</tr>
</tbody>
</table>
WIRELESS VIDEO SYSTEM (WVS)

WVS INITIAL SETUP w/o ERCAs

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

NOTE
Connection not reqd until EVA day
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/o ERCAs (Continued)

2. WVS System

A7  WIRELESS VID HTR – ON
    PWR – ON

3. Photo/TV H/W Preparations

    AVIUs Powering V10s (two)
    SYNC/VIDEO – VIDEO
    HI-Z/75 – 75
    PWR/SELECT – LO

    V10 (two)
    √TV Pwr – ON
    PWR – ON
    Tape installed
    √WVS Test Pattern displayed (color bars w/"No WVS Video")
    PWR – OFF

    Audio
    A11 √CCU PWR – ON
    R10 √MS AUD PWR – AUD/TONE
    √A/G 1 – T/R
    √ICOM A – T/R
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/o ERCAs (Continued)

4. WVS PGSC Prep

PGSC Pwrup and Application Opening

DC UTIL PWR MNC – ON
PGSC
Pwr – ON
Sel Shuttle Apps icon
Sel WVS icon

Sel ‘NO’ at ‘RESTORE TO PREVIOUS SETTINGS’ window

If 'Camera Port Configuration’ error displayed:
Remove Quatech RS-422 Card
Sel ‘Start’> 'Shut Down'> ‘OK’
Reinstall Quatech RS-422 Card
Pwr – ON
Sel Shuttle Apps icon
Sel WVS icon
RF Camera page will appear

Application Setup

If ‘Static XCVR’(‘Bad Camera ID’, ‘Temp Alert’, ‘Temp Caution’) alert msg:
Perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)
If ‘Static RF Camera’ alert msg:
Disregard
Sel File → 'Assign Camera ID'
Verify following:

<table>
<thead>
<tr>
<th>Camr Address</th>
<th>S/N</th>
<th>In Use</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1010</td>
<td>1</td>
<td>EV1</td>
</tr>
<tr>
<td>18</td>
<td>1007</td>
<td>1</td>
<td>EV2</td>
</tr>
</tbody>
</table>

When complete, sel ‘OK’
If Camr IDs not correct:
Sel ‘Delete Entry’ until all deleted
Perform CAMR ID ASSIGNMENT (Cue Card, WVS) as reqd
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/o ERCAs (Concluded)

4. WVS PGSC Prep (Concluded)

   Application Setup (Concluded)
   Sel File → Advanced Controls
   On XCVR tab:
   √Chroma Stabilizer – selected
   √IF – selected
   √Other options not selected

   Sel RF Camera tab:
   √Power Selections – selected
   √Automatic Gain Control – selected
   √S-Band Level – selected
   √Other options not selected

   When complete, sel OK

5. PWRDN

   Sel File → Exit

   A7  WIRELESS VID PWR – OFF
       HTR – OFF

   Go to DEACTIVATION (Cue Card, TV) as reqd
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/ERCAs

1. Unstow and set up IV H/W per diagram
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/ERCAs (Continued)

2. WVS System

A7   WIRELESS VID HTR – ON
     PWR – ON

3. Photo/TV H/W Preparations

   AVIU Powering V10s (two)
   SYNC/VIDEO – VIDEO
   HI-Z/75 – 75
   PWR/SELECT – LO

   V10 (two)
   √TV Pwr – ON
   PWR – ON
   DISPLAY pb – Press to display tape counter
   √Tape installed
   √WVS Test Pattern displayed (color bars w/"No WVS Video")

   Audio
   A11   √CCU PWR – ON
   R10   √MS AUD PWR – AUD/TONE
   √A/G 1 – T/R
   √ICOM A – T/R
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/ERCAs (Continued)

4. WVS PGSC Prep

PGSC Pwrup and Application Opening

DC UTIL PWR MNC – ON
PGSC Pwr – ON
Sel Shuttle Apps icon
Sel WVS icon
Sel ‘NO’ at ‘RESTORE TO PREVIOUS SETTINGS’ window

If ‘Camera Port Configuration’ error displayed:
Remove Quatech RS-422 Card
Sel 'Start'> 'Shut Down'> 'OK'
Reinstall Quatech RS-422 Card
Pwr – ON
Sel Shuttle Apps icon
Sel WVS icon
RF Camera page will appear

Application Setup
Select Page – XCVR
Transceiver 1(2) CMD Power – ON (green CMD PWR:LVL- “ON:Min”)

Sel RF Camera 1 – One EVA crewmember (green “ON”)
Sel RF Camera 2 – Other EVA crewmember (green “ON”)

If crewmember designations not in pulldown menu:
RF Camera 1,2 – None
Perform CAMERA ID ASSIGNMENT (Cue Card, WVS), then:
Reattempt RF Camr selections

If alert msg, perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS INITIAL SETUP w/ERCAs (Continued)

4. WVS PGSC Prep (Concluded)

   Application Setup (Concluded)
   Sel File → Advanced Controls
     On XCVR tab:
     √Chroma Stabilizer – selected
     √IF – selected
     √Other options not selected

     On RF Camera tab:
     √Power Selections – selected
     √Automatic Gain Control – selected
     √S-Band Level – selected
     √Other options not selected

     When complete, sel OK

5. WVS Checkout

   TV System
   Perform ACTIVATION (Cue Card, TV)

   EMU, Airlock Prep
   Airlock
     Lights – ON
   EMU
     √EMU TV installed on Helmet
   PLSS
     REBA sw – ON
   EMU
     EMU TV Pwr pb – Press (green LED)

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

<table>
<thead>
<tr>
<th>Video Routing Check</th>
<th>CCTV PL 3 port – One of two XCVR/AVIU inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12 (WIB)</td>
<td>VID OUT MON 1(2) pb – push</td>
</tr>
<tr>
<td>A7</td>
<td>IN PL 3(WVS) pb – push</td>
</tr>
<tr>
<td>MON</td>
<td>Video quality</td>
</tr>
<tr>
<td>R12 (WIB)</td>
<td>CCTV PL3 – Other XCVR/AVIU input port</td>
</tr>
<tr>
<td>MON</td>
<td>Video quality</td>
</tr>
</tbody>
</table>

6. PWRDN

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

<table>
<thead>
<tr>
<th>EMU</th>
<th>EMU TV Pwr pb – push (no green LED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLSS</td>
<td>REBA sw – OFF</td>
</tr>
<tr>
<td>Airlock</td>
<td>Lights – as reqd</td>
</tr>
</tbody>
</table>

Go to DEACTIVATION (Cue Card, [TV](#)) as reqd
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS DAY-OF-EVA CHECK

1. Photo/TV H/W Activation

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

2. WVS Sys Check

   A7   √WIRELESS VID HTR – ON
        PWR – ON

3. PGSC Pwrup and Application Opening

   O19   √DC UTIL PWR MNC – ON
         PGSC Pwr – ON
         Sel Shuttle Apps icon
         Sel WVS icon

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

         If 'Camera Port Configuration' error displayed:
         Remove Quatech RS-422 Card
         Sel 'Start'> 'Shut Down'> 'OK'
         Reinstall Quatech RS-422 Card
         Pwr – ON
         Sel Shuttle Apps icon
         Sel WVS icon
         RF Camera page will appear

         NOTE
         During EVA prep, EMU TV assy will be pwrd
WIRELESS VIDEO SYSTEM (WVS) (Continued)

WVS DAY-OF-EVA CHECK (Concluded)

4. Application Setup

Select Page – XCVR
Transceiver 1(2) CMD Power – ON (green CMD PWR:LVL- “ON:Min”)
RF Camera 1 – One EVA crewmember (green “ON”)
RF Camera 2 – Other EVA crewmember (green “ON”)

If crewmember designations not in pulldown menu:
√RF Camera 1,2 – None
   Perform CAMERA ID ASSIGNMENT (Cue Card, WVS), then:
   Reattempt RF Camr selections
If alert msg, perform ALERT MSG TROUBLESHOOTING (Cue Card, WVS)

Near middle of RF Camera page, sel 'Advanced Controls'
S-Band Level (two) – Maximum

Select Page – RF CAMERA
For center lens on each RF Camr Assy:
   Lens Iris Cntl – op(cl) until good video on V10(MON)
WIRELESS VIDEO SYSTEM (WVS) (Continued)

SPECIFICATIONS

RF CAMR (aka EVA mobility unit Radio frequency Camr Assembly (ERCA))
- MOUNTING INTERFACE: EVA helmet light structure
- CAMRS: 3 per helmet
  - LENS FOCAL LENGTH:
    - LEFT: 6mm (56° HFOV) (mounted on left helmet light)
    - CENTER: 3.5mm (85° HFOV)
    - RIGHT: 12mm (30° HFOV) (mounted on right helmet light)
  - FOCUS CONTROL: FIXED at HYPERFOCAL
  - IRIS: MANUAL via PGSC
  - SHUTTER SPEED: AUTO(MANUAL)
  - GAIN CONTROL: AUTO(MANUAL) (0 to +6 dB)
  - WHITE BALANCE: AUTO(PRESET)

IMAGER:
- MODEL: Sony XC-999
- HORIZONTAL RESOLUTION: 470 lines
- PIXEL COUNT: 768 Horizontal, 494 Vertical
- SENSING AREA: 6.4mm Horizontal, 4.8mm Vertical, 8.0mm Diagonal
- UHF RCVR ANTENNA: 1 (on top of helmet)
- S-BAND XMTR ANTENNAS: 2 (on side of helmet light batts)
- POWER: 12V from REBA batt enabled by pwr pb on right side of ERCA
- OPERATING TEMP: -31 degC to +185 degC

PAYLOAD BAY TRANSCEIVERS (XCVR): 2 units
- LOCATION: BAY 5 (under PLB liner)
  - OPS POWER: 28 VDC from A7/WIRELESS VIDEO POWER sw, Control Bus BC1
  - HTR POWER: 28 VDC from A7/WIRELESS VIDEO HEATER sw, Control Bus BC1
- OPERATING TEMP: -190 degC to +210 degC

UHF PLB COMMAND ANTENNA: 1 unit
- LOCATION: ODS TRUSS – AFT
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
RF CAMR MOUNTED TO EMU HELMET LIGHT

1. 12mm Lens
2. Pwr sw
3. Pwr Indicator
4. UHF Antenna
5. 3.5mm Lens
6. 6mm Lens
7. S-Band Antenna
WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE (Concluded)

RF CAMR SHELL
RF CAMR ELECTRONICS

- **Remote Head #2**: Gimble mounted w/Helmet light
- **Remote Head #3**: Fixed at center of Helmet
- **Remote Head #1**: Gimble mounted w/Helmet light
- **Lens**: 6mm, 56° H FOV
- **Lens**: 3.5mm, 85° H FOV
- **Lens**: 12mm, 30° H FOV
- **UHF Receive Antenna**
- **S-Band Transmit Antennas**

- **UHF Receiver**
- **S-Band Transmitter**
- **Head Select Switch**
- **Video Port**
- **Aux Comm Port**

- **CCD**
- **Iris Motor**
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
SOFTWARE – TOP STATUS AREA

<table>
<thead>
<tr>
<th>XCVR</th>
<th>RF Camera</th>
<th>CMD PWR:LVL</th>
<th>Frequency</th>
<th>Lens Select</th>
<th>ALERT</th>
<th>Select Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>High</td>
<td>L</td>
<td></td>
<td>RF Camera</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>Low</td>
<td>C</td>
<td></td>
<td>XCVR</td>
</tr>
</tbody>
</table>

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

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.
Selects operational lens. Default is Center.

Lens Select Cmd
[L,C,R]
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)

ALERT Msg Display

Select Page Icons
[RF Camera, XCVR, Telemetry]
Provides selection between the three displays.

RF Camr xmtr pwr status changes to ON when Camr selected (in pulldown menu)
### SOFTWARE – RF CAMR PAGE

<table>
<thead>
<tr>
<th>XCVR</th>
<th>RF Camera</th>
<th>CMD PWR:LVL</th>
<th>Frequency</th>
<th>Lens Select</th>
<th>ALERT</th>
<th>Select Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Off</td>
<td>Off:Min</td>
<td>High</td>
<td>L</td>
<td></td>
<td>RF Camera</td>
</tr>
<tr>
<td>2</td>
<td>Off</td>
<td>Off:Min</td>
<td>Low</td>
<td>L</td>
<td></td>
<td>Telemetry</td>
</tr>
</tbody>
</table>

- **Lens Iris Control**:
  - Close
  - Open

- **Electronic Shutter**:
  - Auto

- **White Balance Control**:
  - Auto

---

**Advanced Control**

- **Automatic Gain Control**:
  - Enabled
  - Power:
    - On
    - Off
    - Mute
  - S-Band Level:
    - Dynamic
**SOFTWARE – RF CAMR PAGE (Concluded)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lens Iris Control</strong></td>
<td>Opens(closes) Iris for selected lens. No telemetry other than video. Number displayed shows motor speed. Can click, hold</td>
</tr>
<tr>
<td><strong>[Close, Open]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Electronic Shutter Control</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>[Auto, Manual]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>White Balance Control</strong></td>
<td>Determines how white balance set for Camr</td>
</tr>
<tr>
<td><strong>[Auto, 2800K, 6100K, Variable]</strong></td>
<td>2800K – PLB lights</td>
</tr>
<tr>
<td></td>
<td>6100K – Sunlight</td>
</tr>
<tr>
<td></td>
<td>Variable – Allows red, blue gain control</td>
</tr>
<tr>
<td><strong>Automatic Gain Control</strong></td>
<td>Controls status of AGC. Enabled needed for dark subjects; otherwise, it is disabled to reduce noise on video</td>
</tr>
<tr>
<td><strong>[Disabled, Enabled]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Power Status</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>[On, Off, Mute]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>S-Band Level</strong></td>
<td>Dynamic (default) – Pwr adjusted per signal strength seen at receiver (adjusted to be received at -40dB)</td>
</tr>
<tr>
<td><strong>[Dynamic, Maximum]</strong></td>
<td>Maximum – Sends signal at full pwr for signal strength problems</td>
</tr>
<tr>
<td><strong>Black Pedestal</strong></td>
<td>NOT USED. Brightness control varies from 0 to 100</td>
</tr>
<tr>
<td><strong>[Increase, Decrease]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Zoom, Focus, LED Control</strong></td>
<td>NOT AVAILABLE. Future capabilities</td>
</tr>
</tbody>
</table>
### SOFTWARE – XCVR PAGE

<table>
<thead>
<tr>
<th>XCVR</th>
<th>RF Camera</th>
<th>CMD PWR LVL</th>
<th>Frequency</th>
<th>Lens Select</th>
<th>ALERT</th>
<th>Select Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>High</td>
<td>L C R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>Low</td>
<td>L C R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Transceiver 1
- **CMD Power**: Off
- **Antenna**: Auto

#### Transceiver 2
- **CMD Power**: Off
- **Antenna**: Auto

#### Advance Controls
- **Chroma Stabilizer**: On
- **IF**: Wide
- **CMD Level**: Min
- **Chroma Stabilizer**: On
- **IF**: Wide
- **CMD Level**: Min
<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMD Power</strong></td>
<td>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</td>
</tr>
<tr>
<td>[OFF,ON]</td>
<td></td>
</tr>
<tr>
<td><strong>Antenna</strong></td>
<td>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</td>
</tr>
<tr>
<td>[Auto,Manual]</td>
<td></td>
</tr>
<tr>
<td><strong>Chroma Stabilizer</strong></td>
<td>NOT USED</td>
</tr>
<tr>
<td>[On,Off]</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate Frequency (IF)</strong></td>
<td>Controls bandwidth sampled for RF Camr return signal. Changed to Narrow during signal strength troubleshooting</td>
</tr>
<tr>
<td>[Wide,Narrow]</td>
<td></td>
</tr>
<tr>
<td><strong>CMD Level</strong></td>
<td>NOT USED w/new spread spectrum XCVRs. Status shown under CMD PWR:LVL in top status area</td>
</tr>
<tr>
<td>[Min,Max]</td>
<td></td>
</tr>
</tbody>
</table>
## WIRELESS VIDEO SYSTEM (WVS) (Continued)

### SOFTWARE – TELEMETRY PAGE

<table>
<thead>
<tr>
<th>XCVR</th>
<th>RF Camera</th>
<th>CMD PWR_LVL</th>
<th>Frequency</th>
<th>Lens Select</th>
<th>ALERT</th>
<th>Select Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>None</td>
<td>OFF Min</td>
<td>High</td>
<td>L</td>
<td>RF Camera</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>None</td>
<td>OFF Min</td>
<td>Low</td>
<td>L</td>
<td>Telemetry</td>
</tr>
</tbody>
</table>

### RF Camera System Telemetry

<table>
<thead>
<tr>
<th>RF Camera Lens</th>
<th>Signal Strength</th>
<th>RX Good</th>
<th>Voltage</th>
<th>Amperes</th>
<th>Temperature (°C)</th>
<th>Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>??? - 1 M RM</td>
<td>-1.00 M</td>
<td>-1 M</td>
<td>0.00 M</td>
<td>0.00 M</td>
<td>32 M</td>
<td>32 M</td>
</tr>
<tr>
<td>??? - 1 M RM</td>
<td>-1.00 M</td>
<td>-1 M</td>
<td>0.00 M</td>
<td>0.00 M</td>
<td>32 M</td>
<td>32 M</td>
</tr>
</tbody>
</table>

### Transceiver Telemetry

<table>
<thead>
<tr>
<th>XCVR 1</th>
<th>32 M</th>
<th>Signal Strength</th>
<th>Antenna Select</th>
<th>Antenna Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.00 M</td>
<td>1 M</td>
<td>Manual M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00 M</td>
<td>1 M</td>
<td>Manual M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XCVR 2</th>
<th>32 M</th>
<th>Signal Strength</th>
<th>Antenna Select</th>
<th>Antenna Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.00 M</td>
<td>1 M</td>
<td>Manual M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.00 M</td>
<td>10.00 M</td>
<td></td>
</tr>
</tbody>
</table>

| Quarter 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 |
| Quarter 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 |
## WIRELESS VIDEO SYSTEM (WVS) (Concluded)

### SOFTWARE – TELEMETRY PAGE (Concluded)

#### RF Camr System Telemetry

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

#### Transceiver Telemetry

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCVR 1,2 Temperature</td>
<td>Displays XCVR temp in degC. Alert range = -40° to -35° C and +80° to +85° C. Caution range = &lt;-40° and &gt;85° C</td>
</tr>
<tr>
<td>[nom = 18 to 37]</td>
<td></td>
</tr>
<tr>
<td>S-Band Signal Strength</td>
<td>Displays return signal strength seen at XCVR in dB</td>
</tr>
<tr>
<td>[nom = 97.5 to -10.5]</td>
<td></td>
</tr>
<tr>
<td>S-Band Antenna Select</td>
<td>Displays which S-Band antenna the XCVR is using to get video signal</td>
</tr>
<tr>
<td>S-Band Antenna Mode</td>
<td>Displays XCVR antenna selection mode</td>
</tr>
<tr>
<td>[Auto, Manual]</td>
<td></td>
</tr>
<tr>
<td>Power Voltage</td>
<td>Displays XCVR system voltage</td>
</tr>
<tr>
<td>[nom = 12.42]</td>
<td></td>
</tr>
<tr>
<td>Power Amperes</td>
<td>Displays XCVR system current</td>
</tr>
<tr>
<td>[nom = 1.10]</td>
<td></td>
</tr>
<tr>
<td>Quads 1,2</td>
<td>Displays current signal strength for each XCVR’s selected S-Band antenna in dB showing strongest of antenna quads</td>
</tr>
</tbody>
</table>
# SEQUENTIAL STILL VIDEO (SSV)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
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<td>16-2</td>
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<td>SSV DEACTIVATION</td>
<td>16-3</td>
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<td>16-4</td>
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<td>CAMCORDER VIA SSV</td>
<td>16-5</td>
</tr>
<tr>
<td>TEST PATTERN VIA SSV</td>
<td>16-6</td>
</tr>
<tr>
<td>SSV TLM DNLK</td>
<td>16-6</td>
</tr>
<tr>
<td>MALS</td>
<td>16-7</td>
</tr>
<tr>
<td>16.1 PWR LED NOT LIT</td>
<td>16-7</td>
</tr>
<tr>
<td>16.2 FRONT PANEL LEDs NOT INDICATING CORRECTLY</td>
<td>16-7</td>
</tr>
</tbody>
</table>
SEQUENTIAL STILL VIDEO (SSV)

SSV NOMINAL SETUP

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

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

   NOTE
   Video Spare 1 controlled by MCC instead of pnl A7

L12 (SSP 2)   PDIP 2 PWR 1 (CB3) – cl

L11 (PDIP 2)   DC PWR 1 CAB PL – ON

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

4. Inform MCC when SSV SETUP complete
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)**
- **DC PWR 1 CAB PL – OFF**

2. **TV System**
   - **Go to DEACTIVATION (Cue Card, TV) as reqd**
SEQUENTIAL STILL VIDEO (SSV) (Continued)

SPECIFICATIONS

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

NOMENCLATURE

IN SEL – BNC CONN
Y/C – 4 PIN DIN CONN
TST_PAT – COLOR BAR TEST PATTERN

MODE
1 – Q = 10
2 – Q = 30
3 – Q = 50
4 – Q = 70
5 – Q = 85
6 – TELEMETRY TEST PATTERN

OUT RATE
1 – 4KBPS
2 – 8KBPS
3 – 16KBPS
4 – 25KBPS
5 – 32KBPS
6 – 64KBPS
7 – 2MBPS
8 – 4MBPS

1 Encoder Data LED
2 28 VDC Port
3 BNC Composite Video Port
4 IN SEL sw
5 Y/C Component Video Port
6 Pwr LED
7 MODE sw
8 OUT RATE sw
9 DOWNLINK OUT Port
10 Fill Frame Data LED
11 Framer Data LED
12 Fuse
SEQUENTIAL STILL VIDEO (SSV) (Continued)

CAMCORDER VIA SSV

1. Config per dwg at right

2. Camcorder Settings

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

   PD100
   - Lens – 3X
   - TV Pwr (O19) – ON
   - CC Pwr – ON
   - 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
SEQUENTIAL STILL VIDEO (SSV) (Continued)

TEST PATTERN VIA SSV

1. Perform SSV NOMINAL SETUP, step 1

2. SSV Settings
   IN SEL – TEST PAT
   Mode – 3 (may change if desired)
   OUT RATE per FLIGHT PLAN
   SSV Pwr – ON
   √Pwr LED illum
   √ENC DATA LED flickering
   √FRM DATA LED flickering
   √FILL FRM pulsing

SSV TLM DNLK

1. Perform SSV NOMINAL SETUP, step 1

2. SSV Settings
   IN SEL – NTSC
   Mode – 6
   OUT RATE per FLIGHT PLAN
   SSV Pwr – ON
   √Pwr LED illum
   √ENC DATA LED flickering
   √FRM DATA LED flickering
   √FILL FRM pulsing
Sequential Still Video (SSV) (Concluded)

MALS

16.1 PWR LED NOT LIT

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

- DC Pwr from orbiter util

16.2 FRONT PANEL LEDs NOT INDICATING CORRECTLY

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

- Cables
- Video source
BINOCULARS

SPECIFICATIONS ................................................................................................................. 17-2
MALS .................................................................................................................................... 17-2

17.1 CANNOT STABILIZE IMAGE ......................................................................................... 17-2
## BINOCULARS

### SPECIFICATIONS

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

### MALS

17.1 **CANNOT STABILIZE IMAGE**

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

SPECIFICATIONS

LIGHT PWR: Orbiter – 6V via IFM Breakout Box

NOMENCLATURE

<table>
<thead>
<tr>
<th>Lens Tip Adapter (FOV in deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10D</td>
</tr>
<tr>
<td>20D</td>
</tr>
<tr>
<td>40D</td>
</tr>
<tr>
<td>40S (Rt angle Lens)</td>
</tr>
<tr>
<td>80D</td>
</tr>
</tbody>
</table>

Mini–Cam

Fiberscope
(SED 33103861–303)

Light Plug

Focusing Ring

Diopter Adjustment Ring

Ocular

Positioning Dot (red)

Objective Lens

Light Guide Windows

Light Guide

Objectives Lens Screw Thread

Locking Ring

Positioning Silt

Light Guide Windows

(Forward-viewing Adapter)

Angle Free Knob (for RIGHT and LEFT)

Angle Knob (for RIGHT and LEFT)

Angle Free Knob (for UP and DOWN)

Angle Knob (for UP and DOWN)
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 (30 MIN), 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(MDDECK) 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 (30 min), 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

2. Remove Battery Holder Assembly from Fiberscope Light

3. DC UTIL PWR MNA – OFF

4. a. Config Breakout Box:
   - AUX – OFF
   - 28V/VAR VOLT – VAR VOLTS
   - PWR A,B – OFF
   b. Remove fuse cap from side A
   c. Rotate GA SEL A – 20
   d. Install 5-Amp Fuse, replace cap

5. Assemble Breakout Box and Multimeter as shown below

![Diagram of assembly process]

- Leads to Side A Volt Test; Red to +
- Black to –
- Insert 5–Amp Fuse
- IFM DC Pwr Cable
- IFM Breakout Box
- MO52J
- DC Util Outlet
- Multimeter
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 (lt 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 (lt on)

13. When finished operating Fiberscope,
   Breakout Box: PWR A – OFF

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
NOTE
Not being flown
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<th>PAGE</th>
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</tr>
<tr>
<td>MONITOR INDICATIONS FOR LDRI VIDEO</td>
<td>20-11</td>
</tr>
</tbody>
</table>
LASER DYNAMIC RANGE IMAGER (LDRI)

SPECIFICATIONS

CAMERA MODEL: Sony XC-ST70
PIXEL COUNT: 720 x 480
CAMERA SENSOR FOV: 15 x 19.7 deg
FOCAL LENGTH: 50.6mm
IRIS: Fixed at F11
FOCUS: Fixed at 6 ft

LASER MODEL & TYPE: LaserTelLT-1110-20W-CS, Class IV rated @ 20W and limited to 11W
LASER WAVELENGTH: 805 nm +/- TBD based upon laser temperature
LASER COVERAGE: 23.7 (vertical) x 19.9 deg (horizontal)
CAMERA/LASER PARALLAX: Approx 1.5 in horizontal
HAZARD ZONE: 9 ft

MOUNTING INTERFACE: Bottom of ITVC (ITVC specifications in CCTV section)
POINTING CAPABILITY: Standard Pan Tilt Unit (PTU)
PAN RANGE: Approx +/-168 deg
TILT RANGE: Approx +175 deg to -130 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
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

NOMENCLATURE (Concluded)

[Diagram with numbered parts]

1. LDRI Front Face
2. Power/Sync Input and Video Output
3. Camera Orifice
4. Laser Orifice (covered by diffuser)
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

OBSS PTU PAN AND TILT RANGES

**Pan**

In this depiction, pan = -90 deg relative to the origin.

+9.8 deg

-170.0 deg

Boom Surface

**Tilt**

+175 deg

-125 deg (negative tilt range is limited by cable routed to LDRI)

Boom Surface

Mounting Surface for PTU

OBSS Interface Bracket

Boom Interface Bracket

origin
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

FUNCTIONAL FLOW

RSC  Illum  Pwr

K1 Pwr Transfer Relay In EE

A8  Pwr

MNA

R12 OBSS Panel

R12 OSVS Power Panel (OPP)

CAB P/L BUS 3

Video

Keep Alive

ITVC  LDRI  PTU

A8  Pwr

MNA or MNB

Cmd

Video

A7  Cmd

RCU

VPU

WIB

PL2

Video

PL3

VSU

DTV (includes recorder)

Orbiter Comm

Ground Processing Workstations

Loose Cable (PDIP Video Cable)

Crew Cabin

Pwr

Video

Video

Pwr

Cmd

Relay Pwr

Enable

Pwr

Video

Pwr

Video

Pwr

Pwr
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

ITVC, LDRI, AND PTU INTERACTIONS

* Pan and tilt values for display on MON
R12

**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/dlnk 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

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
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 MUX pb enables commanding of OBSS LDRI

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

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

MONITOR INDICATIONS FOR LDRI VIDEO

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

Gain value as set by IRIS sw on A7 (70=brightest and 280=darkest)
Default = 280

20.0 FOV  6.0 FT  T 280

Pan, tilt for OBSS PTU
Temp from LDRI Laser

Gain value as set by IRIS sw on A7 (70=brightest and 280=darkest)
Default = 280

20.0 FOV  6.0 FT  T 280

Pan, tilt for OBSS PTU
Temp from LDRI Laser
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:**

<table>
<thead>
<tr>
<th>OBSS State</th>
<th>Pwr</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational/RMS Grappled</td>
<td>124V</td>
<td>APCU1</td>
</tr>
<tr>
<td>MPM Berthed</td>
<td>28V</td>
<td>MNA and MNB (only LCH,IDC heaters in this mode)</td>
</tr>
</tbody>
</table>

**HEATER PWR MODES/SOURCES:**

<table>
<thead>
<tr>
<th>Heater</th>
<th>Pwr</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>124V Heater (RMS Grappled)</td>
<td>124V</td>
<td>APCU1 (SSP1 APCU1 CONV and OUTPUT RLY sws)</td>
</tr>
<tr>
<td>28V Heater (MPM Berthed)</td>
<td>28V</td>
<td>MNA and MNB (Pnl A8 STBD HTRS A,B sws)</td>
</tr>
</tbody>
</table>

**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

1. LCS Camera Controller
2. Database
   - C:\lcs\Config\lcs.dsc
   - Stop Scan
3. Scanning
   - Detailed Area Scan
   - Start Area Scan
   - Continuous Line Scan
   - Start Line Scan
   - Quick View Scan
   - Start Quick View
4. Laser Comm Temp Elec Scan Status:
   - GMT
   - Message
   - MSG ID

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

**LCC SOFTWARE GUI (Continued)**

<table>
<thead>
<tr>
<th>Menu Bar [File, Tools, Help]</th>
<th>Open</th>
<th>Allows user to open and view previous scan bin files. If several open, they are shown in order under File menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>Closes displayed scan bin file. Appears only when viewing previous scans. If several open, only currently selected file will be closed with this function</td>
<td></td>
</tr>
<tr>
<td>Close All</td>
<td>Closes all scan bin files. Appears only when viewing previous scans. If several open, all files will be closed. Multiple scans collected in series will reside in RAM until cleared with this feature. Good housekeeping feature to use between scan AOIs</td>
<td></td>
</tr>
<tr>
<td>Load Database</td>
<td>Allows user to change current database. When load database option selected, a window will appear and allow user to select another database. Only files with .dsc extension selectable</td>
<td></td>
</tr>
<tr>
<td>Exit</td>
<td>See LCC SOFTWARE EXIT DIALOG BOXES; 21-17</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[Tools]</th>
<th>Set GMT</th>
<th>Sets GMT clock on both LCC,LCH. When selected, window will appear allowing A31p time to be set. LCC time must be within 3 sec of onboard SM GPC. Once clock set, LCC A31p will update it's system clock every 5 min using LCH system clock if LCC GUI running</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDC Control</td>
<td>Not used. Allows user to pow on/off IDC. This task preferably done via IDC software</td>
<td></td>
</tr>
<tr>
<td>Zoom Toolbar</td>
<td>Allows Zoom Toolbar to be displayed under Menu Bar</td>
<td></td>
</tr>
<tr>
<td>Intensity Adjustments</td>
<td>Not currently selected(used). Invokes Intensity Adjustment window on GUI so user can adjust Gamma, Brightness, and Contrast of displayed scan image</td>
<td></td>
</tr>
<tr>
<td>Peak Status Highlight</td>
<td>Not currently selected(used). Invokes Peak Status window so user to select voxel status: Below Min Intensity, Above Max Intensity, Overflow, Underflow, Invalid Peak, No Peak, and Multiple Highlights</td>
<td></td>
</tr>
<tr>
<td>Status Toobar</td>
<td>Allows Status Toolbar to be displayed below GUI. Contains only GMT</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[Window] (Menu appears only when scan bin files being viewed)</th>
<th>Cascade</th>
<th>Cascades all currently opened scan bin files</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tile Vertically</td>
<td>Will 'vertically tile' all opened scan bin files. User can scroll up/down with vertical, horizontal slide bars</td>
<td></td>
</tr>
<tr>
<td>Tile Horizontally</td>
<td>Will 'horizontally tile' all opened scan bin files. User can scroll up with vertical slide bar</td>
<td></td>
</tr>
<tr>
<td>Arrange Icons</td>
<td>If multiple windows open and minimized in display area, will align minimized files</td>
<td></td>
</tr>
</tbody>
</table>

| [Help] | About | Displays window w/software-specific information; i.e., version of release. |

**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

**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

**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

- **Continuous Line Scan**
  - Detailed Area Scan Drop-down menu allows user to select one out of a possible 30 continuous line scans
  - Start Line Scan Executes continuous line scan selected from drop-down menu

- **Quick View Scan**
  - Detailed Area Scan Drop-down menu allows user to select one out of a possible 10 quick-view scans
  - Start Quick View Executes quick-view scan selected from drop-down menu
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)

<table>
<thead>
<tr>
<th>System Data Page [Temperature (degC), Electrical]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(One of two pages. Gives user insight into various temp, elec values of components inside LCH. Values are software FDA'd according to limits set in current database. An out of allowable limit value is backlit in yellow and cause a msg to be displayed)</td>
</tr>
<tr>
<td><strong>[Temperature]</strong> Displays LCH component temp values in deg Celsius</td>
</tr>
<tr>
<td><strong>[Electrical]</strong> Displays LCH component elec values. Values are milliWatts, milliamps, and Volts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laser On/Off [Laser On, Laser Off, Laser ?]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Displays on, off status of Laser diode)</td>
</tr>
<tr>
<td><strong>Laser On (Green)</strong> Scan in progress. Backlit in green while laser diode on</td>
</tr>
<tr>
<td><strong>Laser Off (Blue)</strong> Scan not in progress. Backlit in blue while laser diode off</td>
</tr>
<tr>
<td><strong>Laser ? (Gray)</strong> No insight into LCH. Backlit in gray when no LCH to LCC Ethernet connectivity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light displays Ethernet communication state between LCC, LCH</td>
</tr>
<tr>
<td><strong>Green</strong> Light – Indicates good Ethernet connection</td>
</tr>
<tr>
<td><strong>Yellow</strong> Light – Indicates bad Ethernet connection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temp (Green/Yellow)</strong> Light displays temp status of LCH components</td>
</tr>
<tr>
<td><strong>Green</strong> Light – Backlit in green when all LCH component temp values within ranges specified by current database</td>
</tr>
<tr>
<td><strong>Yellow</strong> Light – Backlit in yellow when one or more values out of limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elec</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elec (Green/Yellow)</strong> Light displays elec status of LCH components</td>
</tr>
<tr>
<td><strong>Green</strong> Light – Backlit in green when all elec values within ranges specified by current database</td>
</tr>
<tr>
<td><strong>Yellow</strong> Light – Backlit in yellow when one or more values out of limits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scan Status (Blank, Complete, Vertical Resolution)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blank</strong> When LCS software launched and no scans have been executed</td>
</tr>
<tr>
<td><strong>Complete</strong> Displays last scan line collected or Stop Scan button selected</td>
</tr>
<tr>
<td><strong>Vertical Resolution</strong> 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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Message Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GMT</strong> Displays GMT of time tagged off-nominal message</td>
</tr>
<tr>
<td><strong>Message</strong> Displays text description of error messages. Any messages displayed here are logged into system log</td>
</tr>
<tr>
<td><strong>MSG ID</strong> Display unique six-digit number that cooresponds to error message that appears in message area</td>
</tr>
<tr>
<td><strong>CLR</strong> Clears current error messages displayed in message area. Button will invoke a dialogue box asking user if he wants to clear message area</td>
</tr>
<tr>
<td><strong>GMT DDD/HH:MM:SS</strong> 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</td>
</tr>
</tbody>
</table>
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:

<table>
<thead>
<tr>
<th>OBSS State</th>
<th>Pwr</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMS Grappled</td>
<td>124V</td>
<td>APCU1 (SSP1 APCU1 CONV and OUTPUT RLY sws)</td>
</tr>
<tr>
<td></td>
<td>28V</td>
<td>MNA and MNB (Pnl A8 STBD HTRS A,B sws)</td>
</tr>
</tbody>
</table>

(only heater pwrd in this mode)

IMAGER MODEL: Adimec-2000m/S gray-scale imager
CCD: 1920 x 1080
CCD PIXEL SIZE: 7.4 microns (square pixels)
SPECTRAL RESPONSE:
- 350 nanometers (25%)
- 500 nanometers (42% Peak)
- 700 nanometers (20%)
FOCAL LENGTH: 50mm
DYNAMIC RANGE: 60dB
GAIN: 1X-8X
APERTURE: f/8
FOCUS DISTANCE: 6 ft 3 in
WORKING DISTANCE: 5 ft
- Target Resolution at 5 ft: 113 pixels/in
- Horizontal Coverage at 5 ft: 17 in
- Vertical Coverage at 5 ft: 10 in
INTERFACE: 10Base2 half duplex
CREW CONTROL:
- Hardware – LCC (Laser Camr Controller – A31p)
- Software – LCC software shortcut (Shuttle Apps\IDC)
IMAGE FORMAT: 16-bit tif
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

IDC NOMENCLATURE

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

50mm Lens
IDC SOFTWARE GUI

1. ISIS Digital Camera for OBSS
   - Other Commands...

2. GMT: DD:HH:MM:SS
3. Fit: X: xxxx Y: yyyy
4. Cam Temp: ## C
5. Power On
6. Power Off
7. Use
8. Use
9. Default
10. Scan Lo-Res
11. Scan Hi-Res
12. View File...
13. Acquire Set
14. Acquire One
15. Advanced...
16. Gain: #X
17. Exp: ####### usec
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

IDC SOFTWARE GUI (Continued)

<table>
<thead>
<tr>
<th>Other Commands (Pulldown menu provides other commands w/ hot keys)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[F2] Clear text in text window</td>
</tr>
<tr>
<td>[F4] Append text to an image</td>
</tr>
<tr>
<td>[F5] Toggle Summary View</td>
</tr>
<tr>
<td>[F6] Toggle Image Mode</td>
</tr>
<tr>
<td>[F7] Zoom In</td>
</tr>
<tr>
<td>[F8] Zoom Out</td>
</tr>
<tr>
<td>[F9] Reset Brightness and Contrast</td>
</tr>
<tr>
<td>[F10] Reset Auto Exposure Aperture to Default</td>
</tr>
<tr>
<td>[F11] Toggle Auto Exposure Aperture Visibility</td>
</tr>
<tr>
<td>[F12] Find Auto Exposure Aperture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Display Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shows the tiff or last image collected</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status Bar 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMT Displays current time</td>
</tr>
<tr>
<td>Zoom Level Fit, 1X, 2X, 4X, 8X</td>
</tr>
<tr>
<td>Mouse Position Shows &quot;X,Y&quot; positions of mouse</td>
</tr>
<tr>
<td>Camr Temperature Temperature of Camr in Celsius</td>
</tr>
<tr>
<td>Comm Status Light Blinking green light when in nominal case; static while imaging</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power On/Off, Auto Exposure (AE), Color Coded (CC), Scenario File Drop List/Brightness and Contrast Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Power On]/[Power Off] Buttons control the pwr to the IDC</td>
</tr>
<tr>
<td>[Use AE] Allows selection of auto-exposure capability</td>
</tr>
<tr>
<td>[Use CC] Allows user to color code the over and under exposed areas of image</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>Brightness and Contrast When user switches into &quot;Image Mode&quot;, scenario drop down list turns into &quot;Brightness and Contrast&quot; controls, allowing user to manipulate viewable image Note: Brightness and Contrast has no control over Camr brightness or contrast</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Image Command Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image Acquisition Buttons (Each button may be accessed during another operation to switch acquisition types quickly. Allows user to set scene with &quot;Scan Lo-Res&quot; and then Hi-Res&quot;, &quot;Acquire Set&quot; or &quot;Acquire One&quot; as needed without extra action)</td>
</tr>
<tr>
<td>Scan Lo-Res Image(s) not saved to disk. Displays decimated Camr view. Used to set software exposure and situational awareness</td>
</tr>
<tr>
<td>Scan Hi-Res Continuously saves full images to disk</td>
</tr>
<tr>
<td>Acquire Set Image(s) saved to disk. Acquires bracket set of images</td>
</tr>
<tr>
<td>Acquire One Image saved to disk. Acquires one image with no exposure control from AE</td>
</tr>
<tr>
<td>View and Save Files Allows user to select a file from a directory to view or (when holding &quot;CTRL&quot; 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</td>
</tr>
<tr>
<td>Advanced Command Button brings up an Advanced Settings dialog box in which user may apply specific setting for individual image acquisition options. See pg 21-12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Status Bar 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains status of current operation, gain and exposure settings for image being displayed, Status Bar Error Advisory, Status Error Strings, and Normal Operation Strings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides an entry form to input comments before image acquisition or append comments into a stored image. Note: Previous comments cannot be discarded</td>
</tr>
</tbody>
</table>
Advanced Settings

**Acquire One**
- Exposure: 
- Gain: 
- Display:

**Acquire Set**
- Select Image:
- Exposure: 
- Gain: 
- Display:

**Scan**
- Select Type:
  - Lo-Res
  - Hi-Res
- Exposure: 
- Gain: 
- Decimation:

**Do Self Test**
- Black Level: 

**Cancel** | **Reset to Defaults** | **Accept**
IDC SOFTWARE GUI (Concluded)

### *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 |

### *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 |
| [Display] Checkbox | Selecting checkbox displays each acquired image as it is taken. If unchecked, no images are displayed, only saved. In each case, user will watch acquiring image set status bar count up each acquired image |

### *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 |

### "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. LC-1 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)
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

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

[Diagram showing connections and interfaces between various components such as MCC, LCC, APCU, LCH, and others, with labels and symbols indicating power and data flow.]
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCC SOFTWARE EXIT DIALOGUE BOXES

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

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

- **Shutdown**
  
  **Shutdown Options**
  - Shutdown LCHI and exit LCC software
  - Exit LCC software

- **Shutdown?**
  - This will shutdown the LCH and the IDC.
  - Note: LCH power cycle will be required to resume sensor operations.

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

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

- **Shutdown?**
  - This will only exit the LCC software.
  - Note: LCH health and status monitoring is not possible in this state. LCC software will need to be restarted to shutdown the LCH.

OK will exit the LCC software only.

OK  Cancel

---

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

MANUAL A31p DESKTOP DNLK SETUP

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

1. Video destination properly configured per LCC ACTIVATION, step 1 (Cue Card, LCS) and pwrd MO58F TV PWR – ON
   AVIU HI/LO – LO

2. Desktop
   Right click
   Sel 'Properties'

3. 'Display Properties' Dialog Box
   Sel 'Settings'
   Screen Area – 1024 x 768
   If not 1024 x 768:
      Move Screen Area slidebar to 1024 x 768
      Sel 'Apply'
      When second 'Display Properties' dialog box opens:
      Sel 'OK'
      When 'Monitor Settings' dialog box opens:
      Sel 'Yes'

4. 'Display Properties' Dialog Box
   Sel 'Advanced'

5. '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box
   Sel 'Displays'
6. TV display tab
   If Green tab:
   - Go to step 7
   If Red tab:
   - Click Red tab. Tab automatically turns green after selection (see fig 21-1)
   - Go to step 7
   If Gray tab:
   - Sel 'Cancel' (closes '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box)
   - Video Destination connection
     - Configure per LCC ACTIVATION, step 1 (LCS, Cue Card)
     - TV PWR – ON
     - HI/LO – LO
     - Repeat steps 4-6
     - If connected:
       - Connection secure
       - Repeat steps 4-6
     - If tab still Gray: MCC

Figure 21-1.- Video Output
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

MANUAL A31p DESKTOP DNLK SETUP (Concluded)

7. Blue double box ( ) on TV display highlighted (see fig 21-1)
   - If Blue double box highlighted:
     Sel 'OK'
     Go to step 9
   - If Blue double box not highlighted:
     Sel double box ( )
     Sel 'OK'

8. ATI Property Page
   Sel 'Yes'

9. 'Display Properties' Dialog Box
   Sel 'OK'

RECONFIGURATION OF A31p SCREEN RESOLUTION

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

A31p
1. Desktop
   Right click
   Sel 'Properties'

2. 'Display Properties' Dialog Box
   Sel 'Settings'
   Sel 'Advanced'

3. '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box
   Sel 'Displays'
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Concluded)

RECONFIGURATION OF A31p SCREEN RESOLUTION (Concluded)

4. $\sqrt{TV}$ display tab
   If Red(Gray) tab:
   Go to step 5
   If Green tab:
   Click Green tab. Tab automatically turns red after selection (see fig 21-1)
   Sel 'Apply'

5. 'ATI Property Page' Dialog Box
   Sel 'Yes'

6. '(Multiple Monitors) and ATI MOBILITY FIRE GL 7800 Properties' Dialog Box
   Sel 'OK'

7. 'Display Properties' Dialog Box
   Sel 'OK'

8. Desktop
   Right Click
   Sel 'Properties'

9. 'Display Properties' Dialog Box
   Sel 'Settings'
   Move Screen Area slidebar to 1600 x 1200
   $\sqrt{Colors – True Color (32 bit)}$
   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'
BATTS & FUSES

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

DCS BATT CHARGING

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

ML85E
2. √cb DC 10 AMP MNB CB4 – cl
√DC 10 AMP MNB S4 – ON
Batt Chgr 3. √cb PWR IN (CB1) – cl

4. MAIN PWR – ON (LED on)
5. If Direct Camr Pwr:
√cb PWR OUT (CB2) – cl
CAMERA PWR – ON (LED on)

6. Insert Batt(s), check charger LEDs for charge status (~2 hr 45 min)

NOTE
Green lt (≤45 min) = 80% charge. For full charge, leave batts for additional 2 hr.
OK to leave batts in charger longer
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. √ TV PWR – ON

4. Insert Batt in charger. Check charger LED for charge status (~2 hr)
### BATTS & FUSES (Continued)

#### BATT/FUSE REFERENCE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>BATTERY</th>
<th>SAME AS:</th>
<th>FUSE</th>
<th>SAME AS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVIU</td>
<td>NONE</td>
<td>N/A</td>
<td>2A</td>
<td>CCPI</td>
</tr>
<tr>
<td>BINOculars – 14 X40 GYRO – 10 X40 GYRO</td>
<td>AA (6)</td>
<td>AA</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>BPSMU</td>
<td>18V (two 9V)</td>
<td>NONE</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>CAMCORDER – PD100</td>
<td>LI-ION</td>
<td>RECORDER – V10</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>CC Batt Charger</td>
<td>N/A</td>
<td>N/A</td>
<td>3A</td>
<td></td>
</tr>
<tr>
<td>CCPI</td>
<td>NONE</td>
<td>N/A</td>
<td>2A (2), 4A, 8A</td>
<td>SPARE CCPI FUSE KIT AVIU</td>
</tr>
<tr>
<td>DCS 760</td>
<td>NIMH (RECHARGEABLE)</td>
<td>NONE</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>DCS Batt Charger</td>
<td>N/A</td>
<td>N/A</td>
<td>CB</td>
<td>N/A</td>
</tr>
<tr>
<td>HISL</td>
<td>NONE</td>
<td>N/A</td>
<td>5A</td>
<td>NONE</td>
</tr>
<tr>
<td>LAVALIER MIC</td>
<td>76 (1)</td>
<td>NONE</td>
<td>NONE</td>
<td>NONE</td>
</tr>
<tr>
<td>LCD MONITOR</td>
<td>AA (6)</td>
<td>AA</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>NIKON F5 BODY</td>
<td>AA (8)</td>
<td>AA</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>NIKON F5 DATA BACK</td>
<td>CR 2025 3V (2)</td>
<td>NONE</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>NIKON FLASH</td>
<td>AA (4)</td>
<td>AA</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>PHOTOFLOOD</td>
<td>NONE</td>
<td>N/A</td>
<td>1.7A</td>
<td>N/A</td>
</tr>
<tr>
<td>RECORDER – V10</td>
<td>LI-ION</td>
<td>CAMCORDER – PD100</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td>SEQUENTIAL STILL VIDEO ENCODER</td>
<td>N/A</td>
<td>N/A</td>
<td>2A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### IFM FUSE KIT

<table>
<thead>
<tr>
<th>INSTRUMENT FUSES</th>
<th>BUS FUSES (1/4 X 1-1/4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 A(2)</td>
<td>1/4A (2)</td>
</tr>
<tr>
<td>5A (5)</td>
<td>3A (2)</td>
</tr>
<tr>
<td>1A (5)</td>
<td>1/2A (2)</td>
</tr>
<tr>
<td>7.5A (2)</td>
<td>5A (5)</td>
</tr>
<tr>
<td>2A (2)</td>
<td>1A (2)</td>
</tr>
<tr>
<td>10A (2)</td>
<td>7.5A (2)</td>
</tr>
<tr>
<td>3A (5)</td>
<td>2A (2)</td>
</tr>
<tr>
<td></td>
<td>10A (2)</td>
</tr>
</tbody>
</table>

*Night Vision Image Intensifier fuse is 1A Disc type which is glued to Battery cap. Spare is actually another Battery cap.*
CUE CARD CONFIGURATION

<table>
<thead>
<tr>
<th>CUE CARD CONFIGURATION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TV</td>
<td>CC 23-3</td>
</tr>
<tr>
<td>PLAYBACK</td>
<td>CC 23-5</td>
</tr>
<tr>
<td>ET PHOTO</td>
<td>CC 23-7</td>
</tr>
<tr>
<td>FILM ALLOCATIONS</td>
<td>CC 23-8</td>
</tr>
<tr>
<td>WVS</td>
<td>CC 23-10</td>
</tr>
<tr>
<td>PLBD VTR RECORDING (NOT BEING FLOWN)</td>
<td>CC 23-12</td>
</tr>
<tr>
<td>LDRI/ITVC</td>
<td>CC 23-14</td>
</tr>
<tr>
<td>LCS</td>
<td>CC 23-16</td>
</tr>
<tr>
<td>IDC</td>
<td>CC 23-18</td>
</tr>
</tbody>
</table>
**ACTIVATION**

A3 MON 1(2) PWR – ON (LED ON)
A7 TV DLNK – ENA
PWR CNTRL – PNL
CTRL UNIT – MNA(B)
CNTRL – CMD (wait 10 sec for system initialization)

**OPERATION**

**Auto Ops (Auto Exposure)**

**NOTE**
- MCC has commanded sync config

A7 TV CAMR PWR A(B,C,D,RMS) – ON (tb-ON)
VID OUT MON 1(2) pb – push
IN pb – As reqd
  - if TV:
    - ALC pb – push
    - AVG pb – push
  - if CTVC:
    - ALC pb not illuminated
    - TV CAMR PWR A(B,C,D,RMS) – OFF, wait 10 sec, then ON
    - Repeat until MAIN GAIN pb illuminated
    - LT LEVEL pb – push
    - DAY/NIGHT pb – push
    - ALC pb – push
    - AVG pb – push
    - Repeat for other Camrs as reqd

**Dnlk Ops**

- Coordinate dnlk and sync config w/MCC
- Config audio as reqd

A7 VID OUT DLNK pb – push
IN pb – As reqd
  - if DTV, on MCC GO
L10 √
  - Cables connected
  - MUX/VTR/CAMR – ON (LED on)
  - MUX BYPASS – ACT
  - PWR – on (LED on), DATA FLOW LED flashes twice
  - ONSTANDBY – push (green LED on)
  - INPUT display – VIDEO
A7 VID OUT DTV pb – push
IN pb – As reqd
L10 √
  - DATA FLOW LED – on
  - CHANNEL 3 DATA LED – on

**DEACTIVATION**

- If Illuminator ON:
  - Refer to Illuminator Ops and perform Illuminator OFF
A7 PORT RMS CAMR – WRIST
TV CAMR PWR A(B,C,D,RMS) – OFF (tb-OFF), wait 10 sec
PORT RMS CAMR – EISON
TV CAMR PWR RMS – ON (tb-on), wait 10 sec, OFF (tb-off)
TV PWR CNTRL – PNL
CTRL UNIT – OFF
CNTRL – CMD
A3 MON 1(2) PWR – OFF
  - if DTV:
L10 √
  - ONSTANDBY – push (red LED on)
  - PWR – off (LED off)
  - MUX/VTR/CAMR PWR – off (LED off)
  - VTR/CAMR Pwr – off (LED off)

**Man Ops – CTVC/ITVC (Manual Exposure)**

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

**Manual Exposure ON**

A7 MAIN GAIN pb – push
0(+12,+24) dB pb – push
CAMR CMD RMS – OP.CL

**Return to Auto Exposure**

ALC pb – push
AVG pb – push

**MUX Ops**

**NOTE**
- Although dnlk/rca/ctvc is in color, MON will display MUX in B&W

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

**For RSC Ops:**
- Go to LDRI/ITVC Cue Card

**CAUTION**
- DO NOT LEAVE CAMRS UNATTENDED IN MANUAL MODE. DIRECT SUNLIGHT WILL DAMAGE CAMRS
Illuminator Ops

**Illuminator ON**

R14(D,E)

- Wrist Illuminator:
  - cb TV RMS CAMR CAMR/PTU – d
  - Wrist Illuminator HT – d
  - op, then cl
- Elbow Illuminator:
  - cb TV RMS CAMR CAMR/PTU – d
  - Elbow Illuminator HT – d
  - op, then cl
- A(B,C,D) Illuminator:
  - cb TV A(B,C,D) CAMR CAMR/PTU – d
  - A(B,C,D) Illuminator HT – d
  - op, then cl
- RSC Illuminator:
  - Go to LDRI/ITVC Cue Card

**Illuminator OFF**

R14(D,E)

- Wrist Illuminator:
  - cb TV RMS CAMR Wrist Illuminator HT – op, then cl
- Elbow Illuminator:
  - cb TV RMS CAMR Elbow Illuminator HT – op, then cl
- A(B,C,D) Illuminator:
  - cb TV A(B,C,D) CAMR Illuminator HT – op, then cl
- RSC Illuminator:
  - Go to LDRI/ITVC Cue Card
PLAYBACK

ANALOG

ACTIVATION

CC
A7
O19(MO58F)
AVIU
PWR – VTR
CC
OPERATIONS

PLBK or DNLK VIDEO

CC
Install tape, if reqd
If audio reqd:
CCU
If MHA, COMM PWR – ON
ATU
PWR – AUD
Desired Loops – T/R
Other Loops – RCV(OFF)
XMIT/COM Mode – VOX/VOX
VOX SENS – MAX
A7
VID OUT MON pb – as reqd
IN FLT DECK(MIDDECK) pb – push
CC
VTR pb – REW(FF) to cue tape
If Dnlk
\MCC has commanded async config
A7
\TV DNLK – ENA
VID OUT DNLK pb – push
IN FLT DECK(MIDDECK) pb – push
CC
PLAY pb – push (green • displayed)
If PLBK(DNLK) complete:
STOP pb – push
If CC ops complete, go to DEACTIVATION
DEACTIVATION

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

VTR VIA ANALOG

ACTIVATION

Setup per diagram (back of cue card)
Disconnect CC Video input from AVIU J3
Perform ACTIVATION (Cue Card, TV) as reqd
O19
\TV PWR – ON
AVIU
SYNC/VIDEO – VIDEO
HI-Z/75 – 75
PWR SELECT – LO
L10
(MUX)
\TVR/CC Pwr – on (LED on)
(VTR)
\ON/STANDBY LED – green

OPERATIONS

ANALOG PLBK or DNLK VIDEO

L10 (VTR) Install tape if reqd
\DISPLAY SELECT – DATA
If audio reqd:
(VIP)
PWR – on (LED on, DATA FLOW LED flashes twice)
ATU – PBK/KEY MIC (Amber LED on)
CCU
If MHA, COMM PWR – ON
ATU
PWR – AUD
Desired Loops – T/R
Other Loops – OFF
XMIT/COM Mode – VOX/VOX
VOX SENS – MAX
A7
VID OUT Desired MON pb – push
IN FLT DECK pb – push
L10 (VTR) REW(FF),PLAY,PAUSE pb – push as reqd to cue tape
If Dnlk
\MCC has commanded async config
A7
\TV DNLK – ENA
VID OUT DNLK pb – push
IN FLT DECK pb – push
L10 (VTR) PLAY pb – push (green • displayed)
If PLBK(DNLK) complete:
STOP pb – push
If VTR ops complete, go to DEACTIVATION
DEACTIVATION

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

DIGITAL

ACTIVATION

Setup per diagram (back of cue card)
\TVR/CC PWR – on (LED on)
(VTR)
\ON/STANDBY LED – green

OPERATIONS

PLBK or DNLK VIDEO

L10 (VTR) Install tape, if reqd
\DISPLAY SELECT – DATA
If Index Search reqd:
ID – VTR4
SEARCH MODE pb – push (INDEX SEARCH mode displayed)
\pbb push to move highlight bar to desired GMT start
When VTR auto-cue complete, green • displayed:
L10 (VTR) REW(FF),PLAY,PAUSE pb – push as reqd to cue tape
If Dnlk
\MUX/VTR/CC PWR – on (LED on)
\MUX BYPASS – ACT
\CHANNEL 3 DATA LED – on
L10 (VTR) PLAY pb – push (green • displayed)
If PLBK(DNLK) complete:
STOP pb – push
If VTR ops complete, go to DEACTIVATION
DEACTIVATION

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

(reduced copy)
**TOP**

**ET PHOTO**

DCS 760

**LENS SETTINGS**

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

**CAMR SETTINGS**

- PWR – ON
- REAR LCD
  - √ BATT ICON FULL
  - √ ISO – 100
- TOP LCD
  - √ EXP MODE – M
  - √ SS – 1000
  - √ F/STOP – 8
- DIOPTER – ADJUST
- √ FRAME ADVANCE – S
- √ BODY FOCUS MODE – S

**CRITICAL FOCUS REQD EACH FRAME**

**TOP**

**ET PHOTO**

DCS 760

**PD100**

**LENS CAP – REMOVE, SECURE**

**MODE – CAMERA**

**OPEN LCD**

- √ STBY
- √ 1000
- √ F8
- √ (FOCUS – INFINITY)

**AUTO LOCK – HOLD**

**ZOOM – WIDE TO FIND TANK, THEN TIGHT**

**START RECORDING**

- √ LCD DISPLAYS REC

**FINAL DISPLAY**

- 1000
- F8
- 41min
- 48K
## FILM ALLOCATIONS

<table>
<thead>
<tr>
<th>35mm</th>
<th>36 exp/roll</th>
<th>DCS</th>
<th>1gb/117 shots</th>
<th>MINI DVCAM</th>
<th>40 min/tape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll ISO 50 CNeg (Velvia)</td>
<td>7 8 9 10 11 12 13</td>
<td>1 GB Micro Drive</td>
<td>10 9 8 7 6 5 4 3 2 1</td>
<td>231 230 229 228 227 226 225 224 223 222 221</td>
<td>231</td>
</tr>
<tr>
<td>Roll ISO 100 CNeg (EVA)</td>
<td>3 2 1</td>
<td>1 GB EVA Flash Card</td>
<td>15 14 13 12 11</td>
<td>190 189 188 187 186 185 184 183 182 181</td>
<td>191</td>
</tr>
<tr>
<td>Roll ISO 160 CNeg</td>
<td>7 8 9 10 11 12 13</td>
<td></td>
<td></td>
<td>150 149 148 147 146 145 144 143 142 141</td>
<td>141</td>
</tr>
<tr>
<td>Roll ISO 400 CNeg</td>
<td>2 1</td>
<td></td>
<td></td>
<td>130 129 128 127 126 125 124 123 122 121</td>
<td>121</td>
</tr>
<tr>
<td>Roll ISO 800 CNeg</td>
<td>2 1</td>
<td></td>
<td></td>
<td>110 109 108 107 106 105 104 103 102 101</td>
<td>101</td>
</tr>
</tbody>
</table>

### DVCAM

<table>
<thead>
<tr>
<th>3 hr/tape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll ISO 800 CNeg</td>
</tr>
</tbody>
</table>

(reduced copy)
TOP
BACK OF 'FILM ALLOCATIONS'
HOOK
VELCRO

(reduced copy)

CC 23-9

P/TV-4b/115/O/A

P/TV/115/FIN
**ADJUST BRIGHTNESS**

- **Course Adjustment**
  - PGSC Select Page – RF Camera
  - Lens Iris Control – close

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

**DARK SUBJECT**

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

**PWRDN**

- For all lens (three) on each RF Camera Assy:
  - PGSC Lens Iris Control – Close until view black
  - Sel RF Camr 1,2 – None (black “OFF”)
  - V10 Test Pattern displayed (color bars w/“No WVS Video”)
  - PGSC Select Page – XCVR
  - Transceiver 1(2) CMD Pwr – Off
    - (black CMD PWR:LVL=“OFF:Min”)
  - Sel File → Exit

- V10 STOP pb – push
  - Mark, stow tapes
  - PWR – OFF

- A7 WIRELESS VID PWR – OFF
  - HTR – OFF

**VIDEO SIGNAL PROBLEMS**

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

- If no joy:
  - PGSC \Select Page – XCVR
  - Advanced Controls displayed
    - For XCVR w/video problem: IF – Narrow

- If still no joy:
  - A7 WIRELESS VID PWR – OFF, wait 10 sec, ON

- If still no joy:
  - PGSC For XCVR w/video problem: IF – Wide
    - For XCVR w/good video: Sel RF Camr – None (black ‘OFF’)
    - If video acceptable, other EMU TV interfering w/signal
      - Alternately sel EMU TVs to acquire video

- If still no joy:
  - For XCVR w/good video:
    - Sel RF Camr – reselect original EVA crewmember
    - For XCVR w/video problem: Antenna – Manual
    - Sel desired antenna

- If still no joy:
  - For XCVR w/video problem: Antenna – Auto
    - (No MCC)

**COMMANDING PROBLEM (UHF)**

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

**ANTENNA LOCATIONS**

![Antenna Locations Diagram](reducedcopy)
**TOP**

**BACK OF ‘WVS’**

**ALERT MSG TROUBLESHOOTING**

### BAD CAMERA ID

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

1. Select Page – XCVR
   - Transceiver 1(2) CMD Power – On (green CMD PWR:LVL - “ON:Min”)  
   - Sel RF Camera 1,2 – None
   - Sel File > Assign Camera ID
   - Camera IDs match data under CAMR ID ASSIGNMENT
2. If not a match,
   - Highlight entry, then sel ‘Delete Entry’ option
   - Perform CAMR ID ASSIGNMENT
   - Sel RF Camera 1,2 – EVA crewmembers
3. If still no joy:
   - √ MCC

### TEMP ALERT (blue text)

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

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

### TEMP CAUTION (yellow text)

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

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

### CAMR ID ASSIGNMENT

Sel File → Assign Camr ID
1. All EV crewmembers listed as options on pulldown ‘Label’ menu under CAMERA ID SETUP
2. If label entry reqd:
   - Type label into space next to “Add Label” icon
   - Sel “Add Label” icon to add to listing
3. Under CAMERA ID SETUP:
   - Camera Address – As reqd via left/right arrows
   - Serial Number – As reqd via left/right arrows
   - Label – As reqd via pulldown menu
   - “In Use” Box – Check via single click
   - Sel “Save Entry” icon to right of Camr ID table (top)
   - √ Data entry visible in Camr ID table
4. Sel OK

---

**Camr ID Data**

<table>
<thead>
<tr>
<th>Camr Address</th>
<th>16</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial Number</td>
<td>1010</td>
<td>1007</td>
</tr>
<tr>
<td>Label</td>
<td>EV1</td>
<td>EV2</td>
</tr>
</tbody>
</table>

Sel OK

P/TV-5b/115/O/D

---

( unreduced copy )
NOT BEING FLOWN
P/TV-6b/115/O/B
(Front)

NOT BEING FLOWN

(reduced copy)
CC 23-13
**ACTIVATION**

1. Config CCTV Sys
   - A7 ACTIVATION (Cue Card, TV) performed
   - L10 (MUX) MUX/VTR/CC – on
   - Cabling from VTR MONITOR port to DTV V10
   - R12 (VPU) VPU Pwr – ON (LED on)
   - MON 1,2 Green Jumper – LDRI/ITVC

2. Apply SPEE Pwr
   - A8L STBD RMS HTR (two) – OFF
   - R12 (OPP) cb OBSS SW PWR – cl
   - √ OBSS SW PWR – ON
   - A6U EVENT TIMER CNTL – STOP
   - √ EVENT TIMER CNTL – START (15 min LDRI calibration warmup)

3. Config RSC illum to Hi
   - A7 VID OUT MON 1(2) pb – push
   - IN C pb – push
   - PAN/TILT – Adjust to see RSC Camr
   - R12 (OBSS) SPEE PWR – ON
   - MON 1(2) √ RSC illum on Hi (three rings)

4. Enable ITVC
   - R12 (OBSS) ITVC ENA – ON
   - A7 VID OUT DTV pb – push
   - IN PL 2(VPU) pb – push
   - If MAN GAIN pb not illuminated:
     - R12 (OBSS) ITVC ENA – OFF, wait 10 sec, then
     - MON 1(2) ON
     - Repeat until MAN GAIN pb illuminated

5. Verify LDRI Powered
   - A7 VID OUT MUX 1 L pb – push
   - IN MIDDECK pb – push

**GENERAL LDRI CONTROL**

- **Mode 1 (default at start)**
  - A7 LDRI MODE 1 pb – push
  - MON 2 √ ITVC video displayed

- **Mode 2**
  - A7 LDRI MODE 2 pb – push
  - MON 2 √ ITVC video w/illum displayed

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

**DEACTIVATION**

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

- **Mode 2**
  - R12 (OBSS) ITVC ENA – OFF
  - SPEE PWR – OFF

- **A6U EVENT TIMER MODE – UP CNTL – START**

**LDRI MODE SUMMARY**

- **Mode 1 – Standby**
  - ITVC video
  - LDRI in standby

- **Mode 2 – Illuminator**
  - ITVC video w/illum
  - LDRI laser active, LDRI camera inactive

- **Mode 3 – 2D**
  - LDRI 2D video
  - Similar to ITVC video

- **Mode 4 – 2D Gamma**
  - LDRI 2D video w/Gamma Black Stretch
  - Similar to ITVC video

- **Mode 5 – 3D**
  - LDRI 3D video
  - Flicker on MON

- **Mode 6 – 3D Gamma**
  - LDRI 3D video w/Gamma Black Stretch
  - Flicker on MON

**PAN/TILT OPS WITH LDRI ACTIVE**

- **NOTE**
  - When adjusting pan/tilt in Modes 3(4,5,6), ITVC FOCUS (ZOOM, IRIS) cntls functional

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

**GENERAL PTW/STB**

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

- **R12 (OBSS) ITVC ENA – OFF**
  - SPEE PWR – OFF

- **A6U EVENT TIMER MODE – UP CNTL – START**

**GENERAL PTW/STB**

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

- **R12 (OBSS) ITVC ENA – OFF**
  - SPEE PWR – OFF

- **A6U EVENT TIMER MODE – UP CNTL – START**
### RSC CAMR OPS

**NOTE**

Camar nominally powered in Block 4 of PI C/L

<table>
<thead>
<tr>
<th>R12 (OPP)</th>
<th>cb OBSS SW PWR CB1 – cl OBSS SW PWR – ON RSC PWR – ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12 (OBSS)</td>
<td></td>
</tr>
</tbody>
</table>

### RSC ILLUMINATOR OPS

**NOTE**

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

<table>
<thead>
<tr>
<th>R12 (OBSS)</th>
<th>SPEE PWR – ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>A7</td>
<td>VID OUT MON 1(2) pb – push IN PL 3(WVS) pb – push</td>
</tr>
<tr>
<td>MON 1(2)</td>
<td>RSC video displayed</td>
</tr>
</tbody>
</table>

**NOTE**

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

### CONTINGENCY LDRI CLEARANCE VIEW

**NOTE**

Do not apply RMS brakes

<table>
<thead>
<tr>
<th>ABU</th>
<th>AUTO SEQ – STOP (READY lt on)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L10 (VTR)</td>
<td>STOP pb – push (no red •)</td>
</tr>
<tr>
<td>A7U</td>
<td>VID OUT MUX 1 L pb – push (MIDDECK lt on)</td>
</tr>
<tr>
<td></td>
<td>LDRI MODE 3(4) pb – push (steady LDRI video)</td>
</tr>
<tr>
<td></td>
<td>VID OUT MON2 pb – push IN PL2(VPU) pb – push</td>
</tr>
</tbody>
</table>

**NOTE**

Record PTU Pan and Tilt

CAMR CMD PAN/TILT – HI RATE (LO within 10°) PAN: 0 (left, to hard stop) TILT: 0 (up, to hard stop)

### LDRI PAN/TILT RESET

**NOTE**

Reset PTU

<table>
<thead>
<tr>
<th>ABU</th>
<th>AUTO SEQ – PROCEED (IN PROG lt on)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L10 (VTR)</td>
<td>REC pb – push, hold PLAY pb – push, simo (red •)</td>
</tr>
</tbody>
</table>

**NOTE**

LDRI

Return PTU to Pan and Tilt values recorded above

<table>
<thead>
<tr>
<th>ABU</th>
<th>AUTO SEQ – PROCEED (IN PROG lt on)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L10 (VTR)</td>
<td>VID OUT MUX 1 L pb – push (MIDDECK lt on)</td>
</tr>
<tr>
<td></td>
<td>LDRI MODE 6 pb – push (flickering LDRI video)</td>
</tr>
<tr>
<td></td>
<td>VID OUT MON2 pb – push IN pb – as desired (not PL2)</td>
</tr>
<tr>
<td></td>
<td>REC pb – push, hold PLAY pb – push, simo (red •)</td>
</tr>
</tbody>
</table>

**NOTE**

LDRI PAN/TILT – HI RATE PAN – L (to hard stop) TILT – UP (to hard stop) PAN/TILT – RESET
LCH ACTIVATION

APCU/LCH Pwrup
R1 1. PL Pri MNC – ON (tb-ON)
   CAB – MNA(MNB)
SSP 1 2. \Vb SW PWR 1 – cl
   APCU OUTPUT RLY – CL
   CONV – ON (tb-gray)
   \Vb OUTPUT RLY b – gray

LCC ACTIVATION

1. LCC Setup
   Hardware and cables configured per diagram below:

2. LCC PGSC Util Pwr On
   MO63P MN DC UTIL PWR – 10A
   10A J6 – ON
   A31p DC Pwr Supply – ON

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

   (For APCU1 flights only)

4. Verify LCC Desktop Video
   VID OUT MON1(2) pb - push
   IN MIDDECK pb – push
   LCC desktop displayed on MON1(2)
   * If LCC Desktop not displayed *
   * \MCC

OPERATION

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

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

2. LCS System Status

   LCS SYSTEM STATUS

<table>
<thead>
<tr>
<th>Laser On/Off</th>
<th>Comm</th>
<th>LCS State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser (?)(gray)</td>
<td>No Comm (yellow)</td>
<td>Unknown or Keep Alive Heater Only Mode (No LCC to LCS Network Connection)</td>
</tr>
<tr>
<td>Laser Off (blue)</td>
<td>Comm (green)</td>
<td>Configuration (Waiting for user command)</td>
</tr>
<tr>
<td>Laser On (green)</td>
<td>Comm (green)</td>
<td>Operational (Scan in progress)</td>
</tr>
</tbody>
</table>

   While Scan in progress ('Scan Status' counter incrementing):
   * Laser on – green
   * Comm – green
   * Scan Display – updating
   * Temp – green
   * Elec – green

   Scan complete when 'Scan Status: Complete' displayed

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

(reduced copy)

CC 23-16
LCC DEACTIVATION

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

1. LCC Software Shutdown
A31p
Sel ‘File’ > ‘Exit
When ‘Shutdown’ dialog box opens:
√ ‘Shutdown LCH and Exit LCC Software’ selected
Sel ‘OK’
When ‘Shutdown?’ dialog box opens:
Sel ‘OK’

2. A31p Screen Resolution Reset
Go to RECONFIGURATION OF A31p SCREEN RESOLUTION
(LCS/IDC)

LCH DEACTIVATION

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

1. APCU Converters Off/LCH Pwrdn

NOTE
Expect ‘S200 APCU1(2) VOLT LMT’ Msg

SSP 1
APCU1 CONV – OFF (tb-bp)

2. Open APCU Output Relay

SSP 1
APCU1 OUTPUT RLY – OP (tb-bp)

3. Remove Primary PL Pwr

NOTE
Expect ‘S200 APCU1(2) TRIP’ Msgs

R1
PL PRI MNC – OFF (tb-OFF)

TROUBLESHOOTING

Temp or Elec Status Yellow
A31p
Set ‘System’ page
Report ‘Elec’ or ‘Temp’ values backlit in yellow to MCC

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

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

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

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

NOTE
Expect ‘S200 APCU1(2) VOLT LMT’ Msg

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

SM 200 APCU STATUS
APCU1 OUT VOLT RES HIGH: 122V to 126.5V

A31p
LCC PGSC Pwr – ON
√ A31p internal RJ45 Network Interface Card LED green
Perform LCC ACTIVATION, steps 1,3
√ Local Area Network Connection 2 status icon (with red X) in Windows system tray not displayed
√ MCC if LCC GUI Comm status still yellow

Message Area Entry
Report LCC GUI message area log entry(ies) to MCC

(For APCU1 flights only)

(For APCU1 flights only)
IDC ACTIVATION

1. LCC Setup
   Hardware configured per LCC ACTIVATION steps 1,2 (Cue Card, LCS)
   A31p PGSC Pwr – ON

2. IDC connectivity Check
   LCC A31p Internal RJ45 Network Interface Card LED green
      If RJ45 Network Interface Card LED not green:
      APDU1 CONV – OFF, then ON
      CONV tb – gray
      OUTPUT RLY tb – gray
   SM 20D APCU STATUS
      PWR OUT VOL RES HIGH: 122V to 126.5V

IDC SOFTWARE ACTIVATION

1. IDC Software Startup
   A31p Sel ‘Shuttle Apps’ > ‘IDC’

2. Verify GMT
   A31p GMT within 3 sec of SM-GPC GMT
      * If GMT not within 3 sec:
      * Double click on GMT box on GUI
      * Adjust GMT as reqd
      * Sel ‘OK’ on MTU Time dialogue box

3. IDC Pwr on and self test
   NOTE
   Expect ‘iport probe failed’ message at first pwr on attempt.
   If message persists, see TROUBLESHOOTING section

OPRERATION

NOTE

PDRS OPS will call for IDC image steps on LCC A31p.
Limited MCC real-time insight avail if configured for desktop dnlk

1. Configure LDRI Illumination
   R12 (VPU) Green Jumper – LDRI/ITVC
   A7 VID OUT MUX 1L pb – push
      IN MIDDLE pb – push
      LDRI MODE 2 pb – push
      VID OUT MON 1(2) pb – push
      IN PL2 (VPU) pb – push
   SM CAMR CMD PAN/TILT – HI RATE
      PAN – L (to hard stop)
      TILT – UP (to hard stop)
      PAN/TILT – RESET
      – LO RATE within 10°
      PAN – +85 (right)
      TILT – -57 (down)
   NOTE
   If GMT does not update during Ops, an attempt to shut down/restart A31p should be made

2. Auto Exposure (AE) Ops
   A31p Use AE’ checked
      Sel ‘Scan Lo-Res’
      Resize and posn AE box as reqd (pause 2 sec)
      Sel ‘Scan Hi-Res’
      If Scanning with no RMS Motion:
      Move box to maintain RCC in AE box (using keyboard arrows)
      Sel ‘Stop Scan’ at pause point
      ‘Waiting for User Command’ displayed

3. Scenario File Ops
   A31p From Scenario File drop-list, sel appropriate lighting condition
      Sel ‘Acquire Set’
      ‘Acquiring Image Set … Image X’ displayed
      ‘Waiting for User Command’ displayed after set
IDC DEACTIVATION
1. IDC and Software Shutdown
   A31p Select 'Power off' on IDC GUI
   Close (X) IDC software > 'YES'
2. A31p Screen Resolution Reset
   Go to RECONFIGURATION OF A31p SCREEN RESOLUTION (LCS/IDC)

APPENDING COMMENT TEXT TO TIFF
1. If Comment Added Before Scan
   A31p Enter text in comment area
   NOTE
   All scans will contain this comment. Text can be cleared
   with [F2] hot key. Comments cannot be edited post scan
2. If Comment Added After Scan
   A31p Select 'View File' on IDC GUI
   Double click on desired TIFF file
   Enter text in comment area
   Hit [F4] to append comment

IDC HOT KEY COMMANDS
F5 – Toggle Summary View
F6 – Toggle Image Mode
F7 – Zoom In
F8 – Zoom Out
F9 – Reset Brightness and Contrast
F10 – Reset AE Box to Default
F11 – Toggle AE Box Visibility
F12 – Find AE Box

IDC SOFTWARE ERROR MESSAGES
Can't connect to LCH: Perform TROUBLESHOOTING, steps 1, 2
   Condition: Possible heater only mode or Network failure
Iport probe failed: Perform TROUBLESHOOTING, step 2
   Condition: Iport startup check failed. Expected during first pwr on attempt-resend pwr on
Iport not responding: Perform TROUBLESHOOTING, step 2
   Condition: Iport connection lost
Camera not responding: Perform TROUBLESHOOTING, step 2
   Condition: Camera connectivity lost
Image acquisition failed: Perform TROUBLESHOOTING, steps 1, 2
   Condition: Camera connectivity lost during imaging
Network recovery failed: Perform TROUBLESHOOTING, steps 1, 2
   Condition: LCH network switch connection lost
Bad initialization file: Perform TROUBLESHOOTING, step 3
   Condition: Software will not launch due to severe ini file corruption

TROUBLESHOOTING
1. LCC to LCH Connectivity Check
   A31p If Local Area Network Connection 2 (with red X) tool tip on system tray:
   √ Local Area Network Connection 2 Speed 10 mps
   If no connection:
   Perform LCH, LCC, and IDC Reset, step 2
   Continue nominal ops

2. LCH, LCC, and IDC Reset
   A31p Exit IDC software and shut down Windows
   √ OPP to LCC Cable (20 ft) connected to LCC RJ45 port
   NOTE
   Expect 'S200 APCU1(2) VOLT LMT' Msg
   SSP 1
   APCU1 CONV – OFF then ON
   √ CONV tb – gray
   OUTPUT RLY tb – gray
   SM 200 APCU STATUS
   APCU1 OUT VOLT RES HIGH: 122V to 126.5V
   A31p LCC PGSC Pwr – ON
   √ A31p internal RJ45 Network Interface Card LED green
   Perform IDC SOFTWARE ACTIVATION
   Continue nominal ops

3. LCC Swap
   A31p Exit IDC software and shut down Windows
   Swap LCC with other A31p
   Perform IDC Activation
   Perform IDC Software Activation
   Continue nominal ops
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