Photo/TV Checklist

Mission Operations Directorate
Operations Division

Generic, Rev I
June 5, 2007

NOTE
For STS-120 and subsequent flights

National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas

Verify this is the correct version for the pending operation (training, simulation or flight).
Electronic copies of FDF books are available. URL: http://mod.jsc.nasa.gov/do3/FDF/index.html
## List of Implemented Change Requests (482s):

P/TV-0722  
P/TV-0723

Incorporate the following:

1. Replace iii thru viii
2. After 5-38, add section 5A (5A-1 thru 5A-24)
3. After 7-16, add section 7A (7A-1 thru 7A-24)

### NOTE
For STS-126 and subsequent flights

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**Prepared by:**

![Signature]

Mission Lead

**Approved by:**

![Signature]

Lead, Shuttle Photo/TV Group

**Accepted by:**

![Signature]

FDF Manager

Encl: 54 pages

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

P/TV-0718

P/TV-0719

Incorporate the following:

1. Replace iii thru viii
2. After 4-30, add section 4A (4A-1 thru 4A-32)

NOTE

For STS-125 and subsequent flights

Prepared by: [Signature]
Mission Lead

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

Accepted by: [Signature]
FDF Manager

Endl: 38 pages

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

P/TV-0717

Incorporate the following:
1. Replace iii thru vi
2. Replace 11-9 and 11-10

NOTE
For STS-124 and subsequent flights

Prepared by: ____________________________
Mission Lead

Approved by: ____________________________
Lead, Shuttle Photo/TV Group

Accepted by: ____________________________
FDF Manager

Encl: 6 pages

File this PCN immediately behind the front cover as a permanent record
PCN-2 (Nov 7, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):

P/TV-0716

Incorporate the following:

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

NOTE
For STS-122 and subsequent flights

Prepared by: [Signature]
Mission Lead

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

Accepted by: [Signature]
FDF Manager

Encl: 20 pages

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

P/TV-0714
P/TV-0715

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

NOTE
For STS-120 and subsequent flights

Prepared by:  
Mission Lead

Approved by:  
Lead, Shuttle Photo/TV Group

Accepted by:  
FDF Manager

Encl: 80 pages

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

PHOTO/TV CHECKLIST

GENERIC, REVISION I
June 5, 2007

PREPARED BY:

Carol H. Pierce
C. Pierce
Publication Manager

APPROVED BY:

D. Williams
Technical Lead, Shuttle Photo/TV Group

K. Johnson
Manager, Shuttle Procedures Management

ACCEPTED BY:

Michael T. Hurt
FDF Manager

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LIST OF EFFECTIVE PAGES

PHOTO/TV CHECKLIST

GLASS-RAIL CHECKLIST

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PCN-2 11/07/07
PCN-3 04/04/08

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iii ................................... * ALL/GEN I,5 4A-1 ......................... † ALL/GEN I,4
iv ..................................... * ALL/GEN I,5 4A-2 ......................... † ALL/GEN I,4
v ...................................... * ALL/GEN I,5 4A-3 ......................... † ALL/GEN I,4
vi .................................... * ALL/GEN I,5 4A-4 ......................... † ALL/GEN I,4
vii .................................* ALL/GEN I,5 4A-5 ......................... † ALL/GEN I,4
viii .................................* ALL/GEN I,5 4A-6 ......................... † ALL/GEN I,4
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<td>12-8</td>
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† – May be replaced with CD in flight book only
⊗ – Flight copies of this page contain color

v
P/TV/ALL/GEN I,5
18-5................................. † ALL/GEN I
18-6................................. † ALL/GEN I
19-1................................. † ALL/GEN I
19-2................................. † ALL/GEN I
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† – May be replaced with CD in flight book only
⊗ – Flight copies of this page contain color
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This Page Intentionally Blank
Replace this page with section 3 of the Flight Supplement
NOTE
The hardcopy version of sections 4 thru 21 may be replaced with a CD for flight and inserted in the back of the PHOTO/TV flight-supplement flight book.
DCS 760

**SPECIFICATIONS**

**CAMR BODY**

- **CCD SIZE:** 18.48mm x 27.65mm
- **PIXEL COUNT:** 2008 x 3032
- **DISK/FRAME:** 1 GB Micro Drive: 117 Frames; 1 GB EVA Flash Card: 112 Frames
- **FILE SIZE:** 6 MB
- **EXPOSURE CONTROL:** Auto (program, shutter priority, aperture priority), Manual
- **METER PATTERN:** 3D Color Matrix, Center Weighted, Spot
- **EXPOSURE COMP:** ±5 in 1/3 stops
- **SHUTTER:**
  - Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)
  - Manual & Shutter Priority – 1/8000 thru 30 sec (1/3 stop increments), and B (manual only)
- **ISO Setting:**
  - Manual: 80-400
- **MOTOR DRIVE:** Single, C_H (1.5 fps), C_L (1.0 fps), C_S (1.0 fps)
  - Interval: 10-25 shot burst
- **CAMR BATT:** Rechargeable
- **CAMR BATT VOLTAGE:** 7.2V
- **CAMR BATT LIFETIME:** ~100 frames
- **CAMR WEIGHT:** 4.09 lb (w/batt & PCMCIA)

**FLASH**

- **BATT:** 4AA
- **BATT LIFETIME:** ~144-216 shot
- **WEIGHT:** w/o Batts – 0.85 lb
## 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>16mm AF</td>
<td>f/2.8-f/22</td>
<td>123°-82°-148°</td>
<td>1.0</td>
<td>0.69</td>
<td>Rear</td>
<td></td>
</tr>
<tr>
<td>17-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>78°-30°-57°-89°-51°</td>
<td>1.0</td>
<td>1.64</td>
<td>77mm</td>
<td>Yes</td>
</tr>
<tr>
<td>20mm AF</td>
<td>f/2.8-f/22</td>
<td>69°-50°-80°</td>
<td>0.85</td>
<td>0.62</td>
<td>62mm</td>
<td></td>
</tr>
<tr>
<td>20-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>69°-43°-50°-30°-51°</td>
<td>1.7</td>
<td>1.36</td>
<td>77mm</td>
<td>Yes</td>
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<tr>
<td>28mm AF</td>
<td>f/2.8-f/22</td>
<td>53°-37°-61°</td>
<td>1.25</td>
<td>0.46</td>
<td>52mm</td>
<td></td>
</tr>
<tr>
<td>28mm AFD</td>
<td>f/1.4-f/16</td>
<td>53°-37°-61°</td>
<td>1.14</td>
<td>1.15</td>
<td>72mm</td>
<td>Yes</td>
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<tr>
<td>28-70mm AFD</td>
<td>f/2.8-f/22</td>
<td>53°-22°-37°-15°-61°-27°</td>
<td>2.3 (1.5 ft macro)</td>
<td>1.95</td>
<td>77mm</td>
<td>Yes</td>
</tr>
<tr>
<td>35mm AF</td>
<td>f/2.0-f/22</td>
<td>43°-30°-51°</td>
<td>0.9</td>
<td>0.51</td>
<td>52mm</td>
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<tr>
<td>35-70mm AF</td>
<td>f/3.3(4.5)-f/22</td>
<td>60°-31°-42°-21°-69°-37°</td>
<td>2.0 (1.6 ft macro)</td>
<td>0.86</td>
<td>62mm</td>
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<tr>
<td>40mm AFD</td>
<td>f/1.4-f/16</td>
<td>31°-21°-37°</td>
<td>1.5</td>
<td>0.59</td>
<td>52mm</td>
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<tr>
<td>50mm AFD</td>
<td>f/2.8-f/32</td>
<td>26°-18°-31°</td>
<td>0.73</td>
<td>0.93</td>
<td>62mm</td>
<td>Yes</td>
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<tr>
<td>60mm AFD</td>
<td>f/1.8-f/16</td>
<td>19°-12°-22°</td>
<td>3.0</td>
<td>0.93</td>
<td>62mm</td>
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<tr>
<td>85mm AF</td>
<td>f/2.8-f/32</td>
<td>15°-10°-18°</td>
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<td>1.22</td>
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<td>Yes</td>
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<tr>
<td>105mm AF</td>
<td>f/2.8-f/32</td>
<td>9°-6°-11°</td>
<td>5.0</td>
<td>1.72</td>
<td>72mm</td>
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</tr>
<tr>
<td>180mm AFD</td>
<td>f/2.8-f/22</td>
<td>20°-8°-13°-5°-24°-10°</td>
<td>6.0</td>
<td>2.98</td>
<td>77mm</td>
<td>Yes</td>
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<tr>
<td>80-200mm AFD</td>
<td>f/2.8-f/22</td>
<td>5°-4°-6°-10°</td>
<td>10.0</td>
<td>6.36</td>
<td>39mm</td>
<td>Yes</td>
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<tr>
<td>300mm AFD</td>
<td>f/2.8-f/22</td>
<td>4°-3°-5°</td>
<td>9.75</td>
<td>10.58</td>
<td>52mm</td>
<td>Yes</td>
</tr>
<tr>
<td>400mm AFD</td>
<td>f/2.8-f/22</td>
<td>4°-3°-5°</td>
<td></td>
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</tbody>
</table>
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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. TAG/RECORD pb
3. MENU pb
4. CANCEL pb
5. OK pb
6. Image LCD Panel
7. Alert LED
8. Finder Release pb
9. Eyepiece Shutter Lever
10. Viewfinder Eyepiece
11. Auto Exposure (AE–L)/Autofocus Lock (AF–L) pb
12. AF Start (AF–ON) pb
13. Main–Command Dial
14. Microphone
15. Navigate Pad
16. Vertical AF Start (AF–ON) pb
17. Remote Release Port
18. Body Bracketing pb
19. ISO pb
20. Shutter Speed/Aperture/Focus Area Lock pb
21. Flash Sync Mode pb
22. Custom Setting Menu pb
23. Green Panic pb
DCS 760 (Continued)

NOMENCLATURE (Continued)

1. Film Advance Mode/Selftimer Selector
2. Film Advance Mode Selector Lock Release
3. Metering System Selector
4. AF Area Mode pb
5. Exposure Mode pb
6. Pwr/LCD Panel Illumination sw
7. Shutter Release pb
8. Pwr sw Lock Release
9. Exposure Compensation pb
10. Top LCD Panel
11. Diopter Adjustment Knob
12. Accessory Shoe
13. Pwr Adapter Connection (cover not shown)
14. IEEE 1394 Cable Port (cover not shown)
15. Vertical–Shooting Shutter Release pb
16. Card Busy LED Opening
17. Serial Port
18. Video Port
19. Card Busy LED
20. Hard Drive Slot 1
21. Hard Drive Slot 2
22. Eject pb
23. Batt
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
DCS 760 (Continued)

CUSTOM SETTINGS

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

ACTIVATION

CSM pb – press, hold
Main Command Dial – Rotate to desired setting number (lower rear LCD)
Sub-command Dial – Rotate to desired setting (lower rear LCD)

CSM pb – release, then press, hold again
√ Number after dash is “1” and “CUSTOM” displayed on lower rear LCD

DEACTIVATION

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

<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>
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</table>
## CUSTOM SETTINGS (Continued)

<table>
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<th>Settings</th>
<th>Notes</th>
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</thead>
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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>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>Canceled after release</td>
</tr>
<tr>
<td>13</td>
<td>Reserved</td>
<td>13 - 0:</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Center-Weighted Metering</td>
<td>14 - 0: Default</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>
</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>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>
### DCS 760 (Continued)

**CUSTOM SETTINGS (Concluded)**

<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)

SETUP

760 PROGRAM w/FLASH

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

760 SHUTTER PRIORITY (Earth Obs)

- Pwr – ON
- √ Disk installed
- Rear LCD
- √ Batt
- √ Frames remaining sufficient
- √ White Balance – Auto
- ISO – 100
- √ BKT disabled
- √ Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – S
  - SS – 500
- AF Area Mode – [ ] (no “+”)

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

- Meter – Matrix (Spot when ISS <1/2 frame)
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – S
- Lens Focus Mode – A (M/A)
- Aperture – Min, locked
- Flash Settings
  - ON/OFF – OFF
**DCS 760 (Continued)**

**SETUP (Continued)**

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

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pwr – ON</td>
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</tr>
<tr>
<td>Disk installed</td>
<td>✓</td>
</tr>
<tr>
<td>Rear LCD</td>
<td>✓</td>
</tr>
<tr>
<td>Batt</td>
<td>✓</td>
</tr>
<tr>
<td>Frames remaining sufficient</td>
<td>✓</td>
</tr>
<tr>
<td>White Balance – Auto</td>
<td>✓</td>
</tr>
<tr>
<td>ISO – 100</td>
<td>✓</td>
</tr>
<tr>
<td>BKT – BKT, 3F 1.0 displayed</td>
<td>✓</td>
</tr>
<tr>
<td>Focus Area – Center, LOCK displayed</td>
<td>✓</td>
</tr>
<tr>
<td>Exp Comp – 0.0</td>
<td>✓</td>
</tr>
<tr>
<td>Exp Mode – S</td>
<td>✓</td>
</tr>
<tr>
<td>SS – 500</td>
<td>✓</td>
</tr>
<tr>
<td>AF Area Mode – [ ] (no “+”)</td>
<td>✓</td>
</tr>
<tr>
<td>Meter – Matrix</td>
<td>✓</td>
</tr>
<tr>
<td>Diopter – Adjust</td>
<td>✓</td>
</tr>
<tr>
<td>Film Adv – C_H</td>
<td>✓</td>
</tr>
<tr>
<td>Body Focus Mode – S</td>
<td>✓</td>
</tr>
<tr>
<td>Lens Focus Mode – A (M/A)</td>
<td>✓</td>
</tr>
<tr>
<td>Aperture – Min, locked</td>
<td>✓</td>
</tr>
<tr>
<td>Flash Settings</td>
<td>✓</td>
</tr>
<tr>
<td>ON/OFF – OFF</td>
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</table>

**760 CREW PHOTO**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lens – 28mm</td>
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<tr>
<td>Pwr – ON</td>
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</tr>
<tr>
<td>Disk installed</td>
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</tr>
<tr>
<td>Rear LCD</td>
<td>✓</td>
</tr>
<tr>
<td>Batt</td>
<td>✓</td>
</tr>
<tr>
<td>Frames remaining sufficient</td>
<td>✓</td>
</tr>
<tr>
<td>White Balance – Auto</td>
<td>✓</td>
</tr>
<tr>
<td>ISO – 100</td>
<td>✓</td>
</tr>
<tr>
<td>BKT – OFF</td>
<td>✓</td>
</tr>
<tr>
<td>Focus Area – Center, LOCK displayed</td>
<td>✓</td>
</tr>
<tr>
<td>Exp Comp – 0.0</td>
<td>✓</td>
</tr>
<tr>
<td>Exp Mode – A</td>
<td>✓</td>
</tr>
<tr>
<td>AF Area Mode – [ ] (no “+”)</td>
<td>✓</td>
</tr>
<tr>
<td>Meter – Matrix</td>
<td>✓</td>
</tr>
<tr>
<td>Diopter – Adjust</td>
<td>✓</td>
</tr>
<tr>
<td>Film Adv – Selftimer</td>
<td>✓</td>
</tr>
<tr>
<td>Body Focus Mode – S</td>
<td>✓</td>
</tr>
<tr>
<td>Lens Focus Mode – A</td>
<td>✓</td>
</tr>
<tr>
<td>Aperture – Min, locked</td>
<td>✓</td>
</tr>
<tr>
<td>f/stop – 8</td>
<td>✓</td>
</tr>
<tr>
<td>Flash Settings</td>
<td>✓</td>
</tr>
<tr>
<td>ON/OFF – ON</td>
<td>✓</td>
</tr>
<tr>
<td>TTL, Matrix</td>
<td>✓</td>
</tr>
<tr>
<td>Zoom – Auto (no M)</td>
<td>✓</td>
</tr>
<tr>
<td>Tilt – Direct</td>
<td>✓</td>
</tr>
<tr>
<td>Remote Release – Install</td>
<td>✓</td>
</tr>
<tr>
<td>Multiuse Brkt (clamp)</td>
<td>✓</td>
</tr>
<tr>
<td>Focus</td>
<td>✓</td>
</tr>
<tr>
<td>Body Focus Mode – M</td>
<td>✓</td>
</tr>
<tr>
<td>Frame, Fire</td>
<td>✓</td>
</tr>
</tbody>
</table>
DCS 760 (Continued)

SETUP (Continued)

760 EXPOSURE MATCH

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

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

760 AURORA/AIRGLOW

Lens – 50mm
Pwr – ON
\(\sqrt{\text{Disk installed}}\)
Rear LCD
\(\sqrt{\text{Frames remaining sufficient}}\)
\(\sqrt{\text{White Balance – Auto}}\)
\(\sqrt{\text{ISO – 400}}\)
\(\sqrt{\text{BKT – BKT, 3F 1.0 displayed}}\)
\(\sqrt{\text{Focus Area – Center, LOCK displayed}}\)
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**

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

**760 LIGHTNING**

<table>
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<th>Status</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Pwr</td>
<td>ON</td>
</tr>
<tr>
<td>Disk installed</td>
<td>√</td>
</tr>
<tr>
<td>Rear LCD</td>
<td></td>
</tr>
<tr>
<td>Batt</td>
<td>√</td>
</tr>
<tr>
<td>Frames remaining sufficient</td>
<td></td>
</tr>
<tr>
<td>White Balance – Auto</td>
<td></td>
</tr>
<tr>
<td>ISO – 400</td>
<td></td>
</tr>
<tr>
<td>BKT – Disabled</td>
<td></td>
</tr>
<tr>
<td>Focus Area – Center, LOCK displayed</td>
<td></td>
</tr>
<tr>
<td>Exp Comp</td>
<td>0.0</td>
</tr>
<tr>
<td>Exp Mode – M</td>
<td></td>
</tr>
<tr>
<td>SS – 2”</td>
<td></td>
</tr>
<tr>
<td>AF Area Mode – [ ] (no “+”)</td>
<td></td>
</tr>
<tr>
<td>Meter – Matrix</td>
<td></td>
</tr>
<tr>
<td>Diopter – Adjust</td>
<td></td>
</tr>
<tr>
<td>Film Adv – S</td>
<td></td>
</tr>
<tr>
<td>Body Focus Mode – M</td>
<td></td>
</tr>
<tr>
<td>Aperture – Min, locked</td>
<td></td>
</tr>
<tr>
<td>f/stop – F1.4</td>
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<tr>
<td>Flash Settings</td>
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</tr>
<tr>
<td>ON/OFF – OFF</td>
<td></td>
</tr>
<tr>
<td>Remote Release – Install</td>
<td></td>
</tr>
<tr>
<td>Multiuse Brkt (Clamp)</td>
<td></td>
</tr>
<tr>
<td>Focus, Frame, Fire</td>
<td></td>
</tr>
</tbody>
</table>

**TECHNIQUE**

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

**TECHNIQUE**

Fire Camr repeatedly. Luck reqd
DCS 760 (Continued)

SETUP (Continued)

760 MOON

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

760 SILHOUETTE

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

TECHNIQUE

1. Fill FOV w/bright subject
2. Activate Camr
3. Exposure Lock pb – Depress and hold
   - Expect values such as 250, F8-11
4. Focus, Frame, Fire
DCS 760 (Continued)

SETUP (Continued)

760 SUNRISE/SUNSET

- Lens – As reqd
- Pwr – ON
- √Disk installed
- Rear LCD
- √Batt
- √Frames remaining sufficient
- √White Balance – Auto
- ISO – 400
- √BKT – BKT, 3F 1.0 displayed
- √Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – P
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Dioptr – 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 – Auto
- ISO – 100
- √BKT – Disabled
- √Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – A
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Dioptr – Adjust
- Film Adv – S
- Body Focus Mode – M
- Aperture – Min, locked
- f/stop – F22
- Flash Settings
  - ON/OFF – OFF
- Focus, Frame, Fire

TECHNIQUE
Place Sun w/Earth, orbiter, crewmember, etc, in FOV
DCS 760 (Continued)

SETUP (Concluded)

760 TV MONITOR

- Lens – 50mm
- Pwr – ON
- Disk installed
- Rear LCD
- Batt
- Frames remaining sufficient
- White Balance – Auto
- ISO – 100
- BKT – Disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – S
- SS – 30
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – S
- Aperture – Min, locked
- Flash Settings
  - ON/OFF – OFF
- Focus, Frame, Fire
DCS 760 (Continued)

DCS BATT CHARGING

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

2. √cb PWR IN (CB1) – cl

3. MAIN PWR – ON (LED on)

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

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

NOTE
Green lt (≈45 min) = 80% charge. For full charge, leave batts for additional 2 hr. OK to leave batts in charger longer
DCS 760 (Continued)

DATE/TIME SET

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

NOTE
Set TIME/DATE to GMT

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

DELETING SINGLE IMAGES

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

ADDING .WAV FILES TO AN IMAGE

1. OK pb – press
2. Sel image
3. TAG/RECORD pb – press, hold (√microphone icon appears on rear LCD)
4. Talk to MIC (~9-12 in from MIC)
5. √Speaker icon appears under image
DCS 760 (Continued)

IMAGE VIEWING ON PGSC

1. Insert Flash Card into PGSC, brand name up

2. If A31p, open SHUTTLE APPS | Kodak DCS Camera | KODAK DCS Photo Desk
   If 760XD, open SHUTTLE APPS | Photo Desk

3. Sel FILE | OPEN

4. Sel appropriate drive/folder

5. Sel “Open ‘-------’ as contact sheet”

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

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

DCS FILE TRANSFER

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

DNLK FROM FLASH CARD
1. Insert Flash Card into KFX PGSC, brand name up
2. Inform MCC “files ready”

DCS FILE TO HARD DRIVE
1. Insert Flash Card into any networked PGSC, brand name up
2. Double click:
   “My Computer” icon on desktop
   “Removable Disk D” or appropriate drive
   “Folder 1” or appropriate folder
3. Select all files
4. Copy all files
5. Double click:
   “DCS Folder on KFX PGSC” shortcut on desktop
   Appropriate subfolder (e.g., FD1, OMS Pod, etc.)
6. Paste files
7. Close all windows
8. Inform MCC “files ready” on PGSC
9. Stow card
DCS 760 (Continued)

**SUSPECT HARD DRIVE SCAN (760XD ONLY)**

1. Insert suspect Flash Card into PGSC, brand name up
2. Sel ‘Start’ | ‘Run…’
3. In ‘Run’ window, type: SCANDISK, then sel OK
4. In ‘ScanDisk’ window:
   - Sel Flash Card drive (usually D: drive)
   - ‘Type of Test’ – Standard
   - Sel ‘Automatically fix errors’
   - Sel ‘Start’
5. In ‘ScanDisk Results’ Window:
   - If error fixed(nonexistent), continue to use hard drive
   - If error not fixed, mark and stow hard drive
   - Notify MCC of results
6. Close all windows used to scan hard drive

**SUSPECT HARD DRIVE SCAN (A31p ONLY)**

1. Insert suspect Flash Card into A31p, brand name up
2. Sel ‘My Computer’
3. Right click on drive (D:)
4. Sel 'Properties'
5. Sel 'Tools' tab
6. In 'Error-checking' box, sel 'Check Now…'
7. In 'Check Disk' window:
   - Sel 'Automatically fix file system errors'
   - Sel 'Start'
8. Notify MCC of results
9. Sel 'OK' to close dialog boxes
10. Close 'My Computer' window
DCS 760 (Continued)

IMAGE FILE COMPRESSION

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

1. Perform IMAGE VIEWING ON PGSC, steps 1-5 on 4-20, then:

2. Single-click image for compression

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

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

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

6. Sel RENAME IMAGE FILE(S)

If A31p:
7. Enter new file name in “Base Name” window
8. Sel “Save files in ‘-------’ ”

If 760XD:
9. Enter new file name in NEW NAME window

10. Sel “Save files in ‘-------’ ”

11. Sel IMAGE SIZE = 50%

12. Sel IMAGE QUALITY = GOOD

13. √RESOLUTION = 300

14. √DOTS PER INCH selected

15. Sel OK
RECOVER LOST IMAGES

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

   NOTE
   - Scan will take several min

   Sel 'Use folder based recover'
   - Verify '
   in box next to 'Look for additional lost files'
   - Sel 'Continue'
DCS 760 (Continued)

RECOVER LOST IMAGES (Concluded)

7. When 'Preview' window appears, move 'Preview' window below 'mediaRECOVER' window to view progress bar
   
   **NOTE**
   
   When scan completed, 'Save Images' window will appear
   
8. In 'Save Images' window
   
   **NOTE**
   
   May take several minutes to save to 'Recover' folder
   
   √ All images have '✓' in their select box
   
   Sel 'Save Images'
   
9. When finished saving ('Save Images' window will automatically close), close 'mediaRECOVER' window
10. Close 'Kodak DCS Camera' window
11. Notify MCC regarding location of images
Camr Fails to Fire

Nominal Config:
(Camr)
- Pwr – ON
- Disk installed
- Rear LCD
- Batt
- Frames remaining sufficient
- White Balance – Auto
- ISO – 100
- BKT disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – P
- AF Area Mode – [ ]
- Meter – Matrix
- 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?

   Yes
   No

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

   Yes
   No

3. 
   - Focus area – Center
   - Subject contrast – Adequate
   - Lt level sufficient
   Camr fires?

   Yes
   No

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

   Yes
   No

5. 
   - Continue nominal ops

6. 
   - MCC

   Yes
   No

---
Cannot See Thru Viewfinder

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

1. Eyepiece Shutter Lever open
   View obstructed?
   Yes
   No

2. Mirror Lockup Lever released
   View obstructed?
   Yes
   No

3. Continue nominal ops

4. MCC

No
Yes
DCS 760

4.3 CAMR FAILS TO AUTOFOCUS

Nominal Config:

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

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

1
35-70mm lens will not auto-focus in Macro
DCS 760

4.4 “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 – Auto
ISO – 100
√BKT disabled
√Focus Area – Center, LOCK displayed
Exp Comp – 0.0
Exp Mode – P
AF Area Mode – [ ]
Meter – Matrix
Dioptr – Adjust
Film Adv – S
Body Focus Mode – S
Lens Focus Mode – A
Aperture – Min, locked

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

1
• Recycle Camr pwr sw
Blinking “Err” and alert LED disappear?
Yes
2
• Continue nominal ops
No
3
• √MCC
DCS 760

4.5 EXCESSIVE SAVE IMAGE TO HARD DISK TIME

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

1
• Replace Flash Card (PCMCIA)
• Label faulty Flash Card (PCMCIA) and perform SUSPECT HARD DRIVE SCAN, 3-17

Improved save image time after Camr ﬁres?

Yes

2
• Continue nominal ops

No

3
• MCC

05/07/07 4-30 P/TV/ALL/GEN 1
# Specifications

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**SPECIFICATIONS**

**CAMR BODY**

- CMOS SENSOR SIZE: 23.7mm x 15.7mm
- PIXEL COUNT: 4288 x 2848
- DISK/FRAME: 1 GB, ~90 frames; 4 GB, ~360 frames
- RAW FILE SIZE: ~10 MB (compressed)
- EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual
- METER PATTERN: 3D Color Matrix, Center Weighted, Spot
- EXPOSURE COMP: ±5 in 1, 1/3, 1/2 EV steps
- SHUTTER:
  - Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)
  - Manual & Shutter Priority – 1/8000 thru 30 sec (1, 1/3, 1/2) stop increments), 250x, and Bulb (manual only)
- ISO Setting: 100-3200; >800 controlled by menu
- FRAME RATE: Single, $C_H$ – 5 fps, $C_L$ – 1-4 fps
  - Burst Rate: Mode dependent
- CAMR BATT: Rechargeable Li-ION
- CAMR BATT VOLTAGE: 11.1VDC
- CAMR BATT LIFETIME: ~1000 frames
- CAMR WEIGHT: 2.4 lb (w/Batt & Memory Card)

**FLASH**

- SB-28 DX
  - BATT: 4AA
  - BATT LIFETIME: 200+ images
  - WEIGHT: w/o Batt – 0.85 lb

- SB-800 DX
  - BATT: 4AA
  - BATT LIFETIME: 200+ images
  - WEIGHT: w/o Batt – .77 lb
**D2xs (Continued)**

**LENS DATA**

**NOTE**

Do not use non-AF lens w/D2xs

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<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>
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<td>f/2.8-f/22</td>
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<td>180°</td>
<td>0.5</td>
<td>.67</td>
<td>Rear</td>
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<td>12-24mm AF DXG</td>
<td>f/4.0-f/22</td>
<td>89°-53°</td>
<td>100°-61°</td>
<td>1.0</td>
<td>1.02</td>
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<td>16mm AF</td>
<td>f/2.8-f/22</td>
<td>73°</td>
<td>83°</td>
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<td>Rear</td>
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<td>17-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>70°-37°</td>
<td>80°-44°</td>
<td>1.0</td>
<td>1.64</td>
<td>77mm</td>
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<td>20mm AF</td>
<td>f/2.8-f/22</td>
<td>61°</td>
<td>71°</td>
<td>0.85</td>
<td>0.62</td>
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<tr>
<td>20-35mm AFD</td>
<td>f/2.8-f/22</td>
<td>61°-37°</td>
<td>71-44°</td>
<td>1.7</td>
<td>1.36</td>
<td>77mm</td>
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<td>28mm AF</td>
<td>f/2.8-f/22</td>
<td>46°</td>
<td>54°</td>
<td>1.25</td>
<td>0.46</td>
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<tr>
<td>28mm AFD</td>
<td>f/1.4-f/16</td>
<td>46°</td>
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<td>1.14</td>
<td>1.15</td>
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<tr>
<td>28-70mm AFD</td>
<td>f/2.8-f/22</td>
<td>46°-19°</td>
<td>54°-23°</td>
<td>2.3 (1.5 ft macro)</td>
<td>1.95</td>
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<td>35mm AF</td>
<td>f/2.0-f/22</td>
<td>37°</td>
<td>44°</td>
<td>0.9</td>
<td>0.51</td>
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<tr>
<td>35-70mm AF</td>
<td>f/3.3(4.5)-f/22</td>
<td>52°-27°</td>
<td>61°-32°</td>
<td>2.0 (1.6 ft macro)</td>
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<td>f/1.4-f/16</td>
<td>27°</td>
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<td>22°</td>
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<td>0.93</td>
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<td>85mm AF</td>
<td>f/1.8-f/32</td>
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<td>19°</td>
<td>3.0</td>
<td>0.93</td>
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<td>105mm AF</td>
<td>f/2.8-f/32</td>
<td>13°</td>
<td>15°</td>
<td>1.0</td>
<td>1.22</td>
<td>52mm</td>
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<tr>
<td>180mm AFD</td>
<td>f/2.8-f/22</td>
<td>8°</td>
<td>9°</td>
<td>5.0</td>
<td>1.72</td>
<td>72mm</td>
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<td>80-200mm AFD</td>
<td>f/2.8-f/22</td>
<td>16°-7°</td>
<td>20°-8°</td>
<td>6.0</td>
<td>2.98</td>
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<td>300mm AF</td>
<td>f/2.8-f/22</td>
<td>4°</td>
<td>5°</td>
<td>10.0</td>
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<td>3.4°</td>
<td>4.1°</td>
<td>9.75</td>
<td>10.58</td>
<td>52mm</td>
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D2Xs (Continued)

NOMENCLATURE

CAMR – FRONT

1. Vertical Shooting Sub-command Dial
2. Vertical Shooting Shutter-release Lock pb
3. Vertical Shooting Shutter-release pb
4. Function pb
5. Depth-of-field Preview pb
6. Sub-command Dial
7. Power sw
8. Shutter Release pb
9. Ambient Light Sensor
10. Self-timer LED
11. Flash Sync Terminal
12. 10-pin Remote Terminal
13. Lens Release pb
14. Focus mode Selector

jsc48037_152.cvx

4A-4 P/TV/ALL/GEN 1.4
D2Xs (Continued)

NOMENCLATURE (Continued)

1. Speaker
2. ENTER ( )/Playback Zoom ( ) pb
3. Protect ( )/HELP ( ) pb
4. Thumbnail ( ) pb
5. MENU ( ) pb
6. Monitor
7. Playback ( ) pb
8. Delete ( ) pb
9. FORMAT ( ) pb
10. Eyepiece Shutter Lever
11. Viewfinder Eyepiece
12. AE/AF Lock ( ) pb
13. AF-ON ( )
14. Main Command Dial
15. Multi Selector
16. Focus Selector Lock
17. Memory Card Access Lamp
18. AF-area Mode Selector
19. Card-slot Cover Release Button (under Cover)
20. Memory Card Slot Cover
21. Main Command Dial for Vertical Shooting
22. AF-ON ( ) for Vertical Shooting pb
23. Microphone ( ) pb
24. Microphone
25. White Balance (WB) pb
26. Image Quality/Size (QUAL) pb
27. ISO Sensitivity (ISO) pb
28. Rear Control Panel
D2Xs (Continued)

NOMENCLATURE (Continued)

CAMR – TOP

1. Shooting Mode Dial
2. Shooting Mode Dial Lock Release
3. Bracket ( ) pb
4. Ambient Light Sensor
5. Meter Selector
6. Meter Selector Lock pb
7. Exposure Mode ( )/Format ( ) pb
8. Power sw
9. Shutter-release pb
10. Exposure Compensation ( ) pb
11. Top LCD
12. Diopter Adjustment Knob
13. Accessory Shoe
14. Focal Plane Mark ( )
15. Lock ( ) pb
16. Flash Sync Mode ( ) pb
D2Xs (Continued)

NOMENCLATURE (Continued)

CAMR – LEFT SIDE

1. Audio/video (A/V) Connector
2. DC-in Connector
3. USB Connector
4. Battery Cover Latch
D2Xs (Continued)

NOMENCLATURE (Continued)

CAMR – TOP CONTROL PANEL

1. High Speed Crop
2. GPS Connection
3. Exposure Compensation
4. Clock Battery
5. Flash Exposure Lock
6. Flash Sync Mode
7. AF Area Mode
8. Memory Card
9. Exposure Mode
10. Flexible Program
11. Shutter Speed Lock Icon
12. Shutter Speed
13. Exposure Compensation Value
14. Aperture Delta
15. Aperture (f/number)
16. Battery
17. Frame Count
18. Number of Remaining Exposures
19. Multiple Exposure
20. Aperture Lock Icon
21. Interval Timer
22. Image Comment
23. Manual Exposure Meter
24. Bracketing Progress Indicator
25. Bracketing Indicator

jsc48037_156 cvx
D2Xs (Continued)

NOMENCLATURE (Continued)

CAMR – REAR CONTROL PANEL

1. ISO Sensitivity Indicator
2. Shooting Menu Settings Bank
3. Remaining Exposure Indicator
4. Custom Settings Bank
5. Image Size
6. White Balance Bracketing Indicator
7. Voice Memo Recording Indicator (Shooting Mode)
8. Voice Memo Status Indicator
9. Voice Memo Recording Mode
10. White Balance Mode
11. Image Quality
12. ISO Sensitivity Length of Voice Memo
D2Xs (Continued)

NOMENCLATURE (Continued)

VIEWFINDER DISPLAY – LOWER BAR

1. Focus Indicator
2. Metering
3. Bracketing Indicator
4. Autoexposure (AE) Lock
5. Shutter Speed Lock Icon
6. Shutter Speed
7. Aperture Lock Icon
8. Aperture (f/number)
9. Exposure Mode
10. Exposure Compensation Indicator
11. Frame Counter
12. Flash Ready Indicator
13. Electronic Analog Exposure Display
14. Aperture Stop Indicator
15. Sync Indicator
16. FV Lock Indicator
17. Battery Indicator
D2Xs (Continued)

NOMENCLATURE (Concluded)

VIEWFINDER DISPLAY – RIGHT SIDE BAR

1. Voice Memo Status Indicator
2. White Balance Bracketing Indicator
3. White Balance Mode
4. Image Size
5. Image Quality
6. ISO Sensitivity Indicator
   Auto ISO Sensitivity Indicator
7. ISO Sensitivity

Voice Memo Status Indicator
White Balance Bracketing Indicator
White Balance Mode
Image Size
Image Quality
ISO Sensitivity Indicator
Auto ISO Sensitivity Indicator
ISO Sensitivity

jsc48037_159.cvx
## D2Xs (Continued)

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### D2Xs (Continued)

#### CAMR MENU (Continued)

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D2Xs (Continued)

CAMR MENU (Concluded)

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4A-21
**D2Xs (Continued)**

**NOMINAL SETUP**

**D2Xs PROGRAM w/FLASH**

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**SB-800 Flash Settings**

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**D2Xs SHUTTER PRIORITY (EARTH OBS)**

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D2Xs (Continued)

NOMINAL SETUP (Continued)

**D2Xs APERTURE PRIORITY**

- Lens – as reqd
- Aperture – Min, locked
- Body Focus Mode – S
- √Batt installed
- √Flash Card installed
- Pwr – ON
- Top LCD
- √Batt
- √Frames remaining sufficient
- Exp Comp (ź) – 0.0
- Exp Mode – A
  - f/stop – as reqd
- Meter – Matrix (خلاص)
- Diopter – Adjust
- Frame Rate – S
- √BKT disabled – 0 F
- Rear LCD
- √ISO – 100
- √QUAL – RAW
- √WB – 0, A
- AF Area Mode – [ ]
- √Focus Area – Center
- √Focus Selector Lock – L

SB-800 Flash Settings
- √Diffuser Dome installed
- ON/OFF pb – ON
- MODE – [ ]
- √Exp Comp – 0 EV
  - Tilt – 45° (Direct)

**D2Xs MANUAL**

- Lens – as reqd
- Aperture – Min, locked
- Body Focus Mode – S
- √Batt installed
- √Flash Card installed
- Pwr – ON
- Top LCD
- √Batt
- √Frames remaining sufficient
- Exp Comp (ź) – 0.0
- Exp Mode – M
  - SS – as reqd
  - f/stop – as reqd
- Meter – Matrix (خلاص)
- Diopter – Adjust
- Frame Rate – S
- √BKT disabled – 0 F
- Rear LCD
- √ISO – 100
- √QUAL – RAW
- √WB – 0, A
- AF Area Mode – [ ]
- √Focus Area – Center
- √Focus Selector Lock – L

SB-800 Flash Settings
- ON/OFF pb – OFF
D2Xs (Continued)

NOMINAL SETUP (Continued)

D2Xs CREW PHOTO

- Lens – 17-35mm @ 17mm
- Aperture – Min, locked
- Body Focus Mode – S
- \nBatt installed
- \nFlash Card installed
- Pwr – ON
- Top LCD
- \nBatt
- \nFrames remaining sufficient
- Exp Comp ( ≠ ) – 0.0
- Exp Mode – A
  - f/stop – f/8
- Meter – Matrix ( ≠ )
- Diopter – Adjust
- Frame Rate – Selftimer
- BKT disabled – 0 F
- Rear LCD
- \nISO – 100
- \nQUAL – RAW
- \nWB – 0,A
- AF Area Mode – [ ]
- Focus Area – Center
- Focus Selector Lock – L
- SB-800 Flash Settings
  - \nDiffuser Dome installed
  - ON/OFF pb – ON
  - \nMODE – [ ]
  - \nExp Comp – 0 EV
  - Tilt – 45° (Direct)
- Accessory Equipment
  - Shutter Release Cable – Install
  - Multiuse Brkt – Install
  - Multiuse Brkt, Clamp – Install as reqd

Technique
1. Focus on crewmember
2. Body Focus Mode – M
3. Frame, Fire

D2Xs EXPOSURE MATCH

- Lens – 18-24mm @ 18mm
- Aperture – Min, locked
- Body Focus Mode – S
- \nBatt installed
- \nFlash Card installed
- Pwr – ON
- Top LCD
- \nBatt
- \nFrames remaining sufficient
- Exp Comp ( ≠ ) – 0.0
- Exp Mode – P
- Meter – Matrix ( ≠ )
- Diopter – Adjust
- Frame Rate – S
- BKT disabled – 0 F
- Rear LCD
- \nISO – 100
- \nQUAL – RAW
- \nWB – 0,A
- AF Area Mode – [ ]
- Focus Area – Center
- Focus Selector Lock – L
- SB-800 Flash Settings
  - \nDiffuser Dome installed
  - ON/OFF pb – ON
  - \nMODE – [ ]
  - \nExp Comp – 0 EV
  - Tilt – 45° (Direct)

Technique for Single Shots
1. Fill FOV w/sunlit subject
2. Activate D2Xs Camr
3. Auto Exp Lock – Depress,hold
   - Expect values such as 250,f/11
4. Focus, Frame, Fire

Technique for Multiple Shots
1. Fill FOV w/sunlit subject
2. Activate D2Xs Camr
3. Note SS,f/stop
4. Expect values such as 250,f/11
5. Exp Mode – M
   - SS – as noted
   - Aperture – as noted
D2xs (Continued)

NOMINAL SETUP (Continued)

**D2xs AURORA/AIRGLOW**

- **Lens** – 28mm
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- √ **Batt installed**
- √ **Flash Card installed**
- **Pwr** – ON
- **Top LCD**
- √ **Batt**
- √ **Frames remaining sufficient**
- **Exp Comp** (      ) – 0.0
- **Exp Mode** – M
  - SS – 1″
  - f/stop – f/1.4
- **Meter** – Matrix (              )
- **Diopter** – Adjust
- √ **BKT disabled** – 0 F
- **Rear LCD**
- √ **ISO** – 800
- √ **QUAL** – RAW
- √ **WB** – 0, A
- √ **AF Area Mode** – [   ]
- √ **Focus Area** – Center
- √ **Focus Selector Lock** – L

**SB-800 Flash Settings**
- **ON/OFF pb** – OFF

**Technique**
1. Dim cabin lights
2. Use dark clothing to shield window
3. Focus, Frame, Fire

**D2xs CITY LIGHTS/STARS**

- **Lens** – 28mm
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- √ **Batt installed**
- √ **Flash Card installed**
- **Pwr** – ON
- **Top LCD**
- √ **Batt**
- √ **Frames remaining sufficient**
- **Exp Comp** (      ) – 0.0
- **Exp Mode** – M
  - SS – 4
  - f/stop – f/1.4
- **Meter** – Matrix (              )
- **Diopter** – Adjust
- √ **BKT disabled** – 0 F
- **Rear LCD**
  - √ **ISO** – 800
  - √ **QUAL** – RAW
  - √ **WB** – 0, A
  - √ **AF Area Mode** – [   ]
  - √ **Focus Area** – Center
  - √ **Focus Selector Lock** – L

**SB-800 Flash Settings**
- **ON/OFF pb** – OFF

**Accessory Equipment**
- **Shutter Release Cable** – Install
  - **Multiuse Brkt, Clamp** – Install

**Technique**
1. Dim cabin lights
2. Use dark clothing to shield window
3. Focus, Frame, Fire
D2Xs (Continued)

NOMINAL SETUP (Continued)

D2Xs LIGHTNING

- **Lens** – 28mm
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- **√Batt installed**
- **√Flash Card installed**
- **Pwr** – ON
- **Top LCD**
  - **√Batt**
  - **√Frames remaining sufficient**
- **Exp Comp ( sélectionnée )** – 0.0
- **Exp Mode** – M
  - **SS** – 2'
  - **f/stop** – f/1.4
- **Meter** – Matrix ( sélectionnée )
- **Diopter** – Adjust
- **Frame Rate** – S
- **√BKT disabled – 0 F**
- **Rear LCD**
  - **ISO** – 400
  - **√QUAL – RAW**
  - **√WB – 0,A**
  - **AF Area Mode** – [ ]
  - **√Focus Area – Center**
  - **√Focus Selector Lock – L**

SB-800 Flash Settings
- **ON/OFF pb** – OFF

Accessory Equipment
- **Shutter Release Cable** – Install
- **Multiuse Brkt, Clamp** – Install as reqd

Technique
1. **Fire Camr repeatedly. Luck reqd**

D2Xs MOON

- **Lens** – as reqd
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- **√Batt installed**
- **√Flash Card installed**
- **Pwr** – ON
- **Top LCD**
  - **√Batt**
  - **√Frames remaining sufficient**
- **Exp Comp ( sélectionnée )** – 0.0
- **Exp Mode** – M
  - **SS** – 500
  - **f/stop** – f/8
- **Meter** – Matrix ( sélectionnée )
- **Diopter** – Adjust
- **Frame Rate** – S
- **√BKT disabled – 0 F**
- **Rear LCD**
  - **ISO** – 100
  - **√QUAL – RAW**
  - **√WB – 0,A**
  - **AF Area Mode** – [ ]
  - **√Focus Area – Center**
  - **√Focus Selector Lock – L**

SB-800 Flash Settings
- **ON/OFF pb** – OFF
D2Xs (Continued)

NOMINAL SETUP (Continued)

D2Xs SILHOUETTE

- Lens – as reqd
- Aperture – Min, locked
- Body Focus Mode – S
- √Batt installed
- √Flash Card installed
- Pwr – ON
- Top LCD
- √Batt
- √Frames remaining sufficient
- Exp Comp ( ) – 0.0
- Exp Mode – P
- Meter – Matrix (ｋ)
- Diopter – Adjust
- Frame Rate – S
- √BKT disabled – 0 F
- Rear LCD
- √ISO – 100
- √QUAL – RAW
- √WB – 0,A
- AF Area Mode – [ ]
- √Focus Area – Center
- √Focus Selector Lock – L

SB-800 Flash Settings

ON/OFF pb – OFF

Technique

1. Fill FOV w/sunlit subject
2. Activate D2XS Camr
3. Auto Exp Lock – Depress,hold
   - Expect values such as 250,f/11
4. Focus, Frame, Fire

D2Xs SUNRISE/SUNSET

WARNING
DO NOT LOOK AT SUN

- Lens – as reqd
- Aperture – Min, locked
- Body Focus Mode – S
- √Batt installed
- √Flash Card installed
- Pwr – ON
- Top LCD
- √Batt
- √Frames remaining sufficient
- Exp Comp ( ) – 0.0
- Exp Mode – P
- Meter – Matrix (ｋ)
- Diopter – Adjust
- √BKT disabled – 0 F
- Rear LCD
- √ISO – 400
- √QUAL – RAW
- √WB – 0,A
- AF Area Mode – [ ]
- √Focus Area – Center
- √Focus Selector Lock – L

SB-800 Flash Settings

ON/OFF pb – OFF

Technique

1. Focus, Frame, Fire
D2Xs (Continued)

NOMINAL SETUP (Concluded)

D2Xs SUN STAR EFFECT

- **Lens** – 10.5mm
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- **√** Batt installed
- **√** Flash Card installed
- **Pwr** – ON
- **Top LCD**
- **√** Batt
- **√** Frames remaining sufficient
- **Exp Comp** (hesive) – 0.0
- **Exp Mode** – A
  - f/stop – f/22
- **Meter** – Matrix (white)
- **Diopter** – Adjust
- **Frame Rate** – S
- **√** BKT disabled – 0 F
- **Rear LCD**
- **√** ISO – 100
- **√** QUAL – RAW
- **√** WB – 0,A
- **AF Area Mode** – [ ]
- **√** Focus Area – Center
- **√** Focus Selector Lock – L

SB-800 Flash Settings
- **ON/OFF pb** – OFF

**Technique**
1. Place Sun w/Earth, orbiter, crewmember, etc. in FOV

D2Xs TV MONITOR

- **Lens** – as reqd
- **Aperture** – Min, locked
- **Body Focus Mode** – S
- **√** Batt installed
- **√** Flash Card installed
- **Pwr** – ON
- **Top LCD**
- **√** Batt
- **√** Frames remaining sufficient
- **Exp Comp** (hesive) – 0.0
- **Exp Mode** – S
  - SS – 30
- **Meter** – Matrix (white)
- **Diopter** – Adjust
- **Frame Rate** – S
- **√** BKT disabled – 0 F
- **Rear LCD**
- **√** ISO – 100
- **√** QUAL – RAW
- **√** WB – 0,A
- **AF Area Mode** – [ ]
- **√** Focus Area – Center
- **√** Focus Selector Lock – L

SB-800 Flash Settings
- **ON/OFF pb** – OFF
**DATE/TIME SET**

1. **MENU pb – press**
2. Navigate pad – sel Menu icon \( \checkmark \) setup menu
   - press (right)
   - sel WORLD TIME (up,down)
   - press (right)
   - sel DATE (up,down)
   - press (right)
3. Set DATE/TIME to GMT
   Navigate pad – sel desired field (left,right)
   - sel desired setting (up,down)
4. **ENTER pb – press**
5. **MENU pb – press twice**

**DELETING SINGLE IMAGES**

1. **PLAYBACK \( \rightarrow \) pb – press**
2. Navigate pad – sel image (up,down)
3. **DELETE \( \times \) pb – press twice to delete**

**ADDING .WAV FILES TO AN IMAGE**

1. **PLAYBACK \( \rightarrow \) pb – press**
2. Navigate pad – sel image (up,down)
3. **MICROPHONE \( \text{microphone icon} \) pb – press, hold (\( \text{microphone icon} \) appears on rear LCD)
4. Talk to MIC
5. \( \text{Music Note icon} \) appears in upper left image

**DELETING .WAV FILE FROM AN IMAGE**

1. **PLAYBACK \( \rightarrow \) pb – press**
2. Navigate pad – sel image (up,down)
3. **DELETE \( \times \) pb – press**
4. Sel – Sound only
5. **DELETE \( \times \) pb – press**
D2Xs (Continued)

.WAV FILE PLAYBACK

1. PLAYBACK □ pb – press
2. Navigate pad – sel image w/music note ♫
3. MICROPHONE ♪ pb – press

IMAGE FILE TRANSFER

DNLK FROM FLASH CARD
1. Insert Flash Card w/PCMCIA Adapter into KFX PGSC (any networked PGSC), brand name up
2. Inform MCC “files ready”

DCS FILE TO HARD DRIVE
1. Insert Flash Card w/PCMCIA Adapter into any networked PGSC, brand name up
2. Double click:
   “My Computer” icon on desktop
   “Removable Disk D” or appropriate drive
   Folder “DCIM” or appropriate folder
   Folder “100 ND2XS”
3. Select all files
4. Copy all files
5. Double click:
   “Imagery Folder on KFX PGSC” shortcut on desktop
   Appropriate subfolder (e.g., FD1, OMS Pod, etc.)
6. Paste files
7. Close all windows
8. Inform MCC “files ready” on PGSC
9. Stow card
D2Xs (Continued)

RECOVER LOST IMAGES

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

NOTE
Scan will take several min (~45 min)

Sel 'Use folder based recover'
Verify '✓' in box next to 'Look for additional lost files'
Sel 'Continue'
D2Xs (Concluded)

RECOVER LOST IMAGES (Concluded)

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

   NOTE
   When scan completed, 'Save Images' window will appear

8. In 'Save Images' window

   NOTE
   May take several minutes to save to 'Recover' folder

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

9. When finished saving (‘Save Images’ window will automatically close), close 'mediaRECOVER' window

10. Close 'Photo Processing' window

11. Notify MCC regarding location of images
# DCS 760 EVA CAMR

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DCS 760 EVA CAMR

SPECIFICATIONS

CAMR BODY

CCD SIZE: 18.48mm x 27.65mm
PIXEL COUNT: 2008 x 3032
DISK/FRAME: 1 GB: 112 Frames
FILE SIZE: 6 MB
EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual
METER PATTERN: 3D Color Matrix, Center Weighted, Spot
EXPOSURE COMP: ±5 in 1/3 stops
SHUTTER:
  Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)
  Manual & Shutter Priority – 1/8000 thru 30 sec (1/3 stop increments), and B (manual only)
ISO Setting:
  Manual: 80-400
MOTOR DRIVE: Single, 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

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<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>
</tr>
<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>
</tr>
<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 Yes</td>
</tr>
<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 Yes</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 Yes</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 Yes</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)

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
   Tie Wraps (4/Camr)

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

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, 5-33
   Remove 1 GB EVA Flash Card
   Install second 1 GB EVA Flash Card in slot 1
   Rear LCD
   √Frames Remaining ≥112
   If <112, perform 760 QUICK FORMAT, 5-33
   Install first 1 GB EVA Flash Card in slot 2
   √White Balance – Auto
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR ONLY (Continued)

DCS 760

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

Main Menu
   - Menu pb – press
     - Main Menu – press OK
     - Firmware version 3.3.14, page 0
     - Processing – Off
     - Time/Date – GMT
   - Menu pb – press twice
     - Properties
       - Properties – press OK
       - Auto OK Errors – Yes
     - Enable Sharpening – No
       - High Temp Limit – Yes
     - Long Exposure Processing – Exposures >¼ sec
   - CANCEL pb – press twice

5. Remove Lens

   NOTE
   Do not pwr off Camr

DCS Batt

6. CAMR PWR – OFF (LED off)

DCS Batt

Chgr
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<th>Step</th>
<th>Action</th>
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<td>7</td>
<td>Disconnect DCS 760 Pwr Cable from Pwr Adapter Connection on DCS 760 Camr</td>
</tr>
<tr>
<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>
</tr>
<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>DCS Batt Chgr CAMR PWR – ON (LED on)</td>
</tr>
<tr>
<td>15</td>
<td>Install DCS 760 Batt</td>
</tr>
</tbody>
</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 Flaps 1, 4) |

**NOTE**

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

21. Inspect DCS 760 Camr Foot and retaining screw. If loose, tighten. Torque to 37 in-lb (1/4-in Driver Handle, 1/4-in to 3/8-in Step-up, 3/16-in Hex Head, 10-50 in-lb Torque Wrench)

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

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

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

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

FINAL CONFIGURATION

29. Temp stow Flap 3 (will not be used for EVA)
30. Stow Camr until day of EVA
If Remote Cord Assy used:
31. Connect Remote Cord Assy to Remote Release Port on DCS 760 Camr (Connector will thread into place)

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

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

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

760 EVA – CAMR ONLY DISASSEMBLY

**BETWEEN EVAs**

**NOTE**
Removal of Batts,Cards main objective

1. Use scissors to remove Tie Wraps (four) from Camr Mounting Assy and D-Ring
2. Detach Camr Mounting Assy from DCS 760
3. In order to access Batt/PC Door, open Flap 1 of EVA Camr Blanket
4. Remove Light-Pipe from Batt/PC Door
5. Open Batt/PC door:
   - Remove DCS 760 Batt
   - Remove 1 GB EVA Flash Cards (two)

**POST-EVA**

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

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

760 EVA – CAMR ONLY DISASSEMBLY (Concluded)

POST-EVA (Concluded)

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

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

4. Camr Settings
   Pwr – ON
   Install 1 GB EVA Flash Card in slot 1
   Rear LCD
   √Frames Remaining ≥112
   If <112, perform 760 QUICK FORMAT, 5-33
   Remove 1 GB EVA Flash Card
   Install second 1 GB EVA Flash Card in slot 1
   Rear LCD
   √Frames Remaining ≥112
   If <112, perform 760 QUICK FORMAT, 5-33
   Install first 1 GB EVA Flash Card in slot 2
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

DCS 760 4. Camr Settings (Concluded)

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

Main Menu
- Menu pb – press
- Main Menu – press OK
- Firmware version 3.3.14, page 0
- Processing – Off
- Time/Date – GMT
- Menu pb – press twice
- Properties
  - Properties – press OK
  - Auto OK Errors – Yes
  - Enable Sharpening – No
  - High Temp Limit – Yes
  - Long Exposure Processing – Exposures >¼ sec
- CANCEL pb – press twice

DCS 760 5. Remove Lens

NOTE
Do not pwr off Camr

DCS Batt Chgr 6. CAMR PWR – OFF (LED off)
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

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

DCS 760

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

9. Aperture – Min, locked on lens

10. Install lens (Thermal Blanket may need to be adjusted)

11. Lens Cap removed

12. Secure EVA Camr Blanket around lens

13. Reconnect DCS 760 Pwr Cable to Pwr Adapter Connection on DCS 760 Camr

DCS Batt Chgr

14. CAMR PWR – ON (LED on)

15. Install DCS 760 Batt

16. Activate Shutter Release:
   \(\sqrt{\text{No "EE" in viewfinder}}\)
   \(\sqrt{\text{If "EE" displayed, go to step 9}}\)
   \(\sqrt{\text{Lens moves freely under EVA Camr Blanket}}\)

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)

Brkt Assy

21. Obtain Bracket Assy w/Thermal Blanket

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)

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

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

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

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

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

FINAL CONFIGURATION
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

NOTE
Do not remove Camr from orbiter pwr

32. Stow until day of EVA
If Remote Cord Assy configured for use w/Bracket Assy:
33. Insert Remote Cord Assy thru hole in Thermal Blanket (verify Remote Cord Assy not locked) and place lip of remote under Thermal Blanket

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

35. Install DCS 760 Camr onto Bracket Assy (from front)
36. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

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

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

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

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

39. √DCS 760 Camr and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out

40. Loop Tie Wraps (two) from step 37 thru D-Ring on Camr Thermal Blanket. Secure w/o pulling D-Ring taut
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/BRACKET ONLY (Continued)

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

FINAL CONFIGURATION

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

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

760 EVA – CAMR w/BRACKET ONLY (Concluded)

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

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

NOTE
Do not remove Camr from orbiter pwr

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

760 EVA – CAMR w/FLASH

NOTE

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

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

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

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

DCS 760

4. Camr Settings
   Pwr – ON
   Install 1 GB EVA Flash Card in slot 1
   Rear LCD
   √ Frames Remaining ≥ 112
     If < 112, perform 760 QUICK FORMAT, 5-33
   Remove 1 GB EVA Flash Card
   Install second 1 GB EVA Flash Card in slot 1
   Rear LCD
   √ Frames Remaining ≥ 112
     If < 112, perform 760 QUICK FORMAT, 5-33
   Install first 1 GB EVA Flash Card in slot 2
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

DCS 760 4. Camr Settings (Concluded)

- White Balance – Auto
- ISO – 100
- Camr Bracket Disabled
  Top LCD
  - Focus Area – Center, LOCK
  - Exposure Comp – 0.0
  - Mode – P

  - Auto Focus Area Mode – [ ] (no “+” displayed)
  - Meter – Matrix
  - Film Advance – S
  - Body Focus Mode – S
  - Lens Focus Mode – A (if applicable)
  - Aperture – Min, locked

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

Main Menu
  - Menu pb – press
  - Main Menu – press OK

- Firmware version 3.3.14, page 0
- Processing – Off
- Time/Date – GMT
  - Menu pb – press twice

  - Properties
    - Properties – press OK
    - Auto OK Errors – Yes
    - Enable Sharpening – No
    - High Temp Limit – Yes
    - Long Exposure Processing – Exposures >¼ sec

  - CANCEL pb – press twice

5. Remove Lens

NOTE
Do not pwr off Camr

DCS Batt Chgr 6. CAMR PWR – OFF (LED off)
760 EVA – CAMR w/FLASH (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. \( \checkmark \) Aperture – Min, locked on lens
10. Install lens (EVA Camr Blanket may need to be adjusted)
11. \( \checkmark \) 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 760
15. Install DCS 760 Batt
16. Activate Shutter Release:
   \( \checkmark \) No "EE" in Viewfinder
   If "EE" displayed, go to step 9
   \( \checkmark \) 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
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

36. Connect Flash Sync Cable Assy to Flash Sync Port on EVA Flash
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

37. Close Flap A over Flash Sync Cable Assy

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

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

   NOTE
   Adjustments to cables may be reqd during installation
DCS 760 EVA CAMR (Continued)

760 EVA – CAMR w/FLASH (Continued)

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

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

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

51. Flash – OFF
52. Close Flap D
53. Remove DCS 760 Batt from FLASH slot
54. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)

NOTE
Do not remove Camr from orbiter pwr

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

760 EVA – CAMR w/FLASH (Concluded)

PRIOR TO ENTERING AIRLOCK:

If Camr only:

1. Camr Pwr – off
2. Disconnect DCS 760 Pwr Cable
3. Remove 28mm Lens Cap
4. Test fire Camr
5. Install 28mm Lens Cap

If Camr w/Flash:

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

760 EVA – CAMR w/FLASH DISASSEMBLY

BETWEEN EVAs

NOTE
Removal of Batt,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)
POST-EVA

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

CAMR w/FLASH

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

CAMR

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

760 EVA – CAMR w/FLASH DISASSEMBLY (Concluded)

POST-EVA (Concluded)

EVA FLASH AND FLASH BRACKET

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

RETURN CAMR TO NOM OPS (as reqd)

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

DATE/TIME SET

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

NOTE
Set TIME/DATE to GMT

6. Navigate pad – sel desired field (left,right)
7. Navigate pad – sel desired setting (up,down)
8. OK pb – press
DCS 760 EVA CAMR (Continued)

760 QUICK FORMAT

NOTE
Only one card may be in Camr while formatting

1. Pwr – ON
2. MENU pb – press
3. Navigate pad – sel Menu icon , then MAIN MENU
4. OK pb – press
5. Navigate pad – sel ‘Card’
6. OK pb – press
7. Navigate pad – sel ‘Quick Format’
8. OK pb – press
9. ‘Format card? (All data will be erased)’
10. OK pb – press
11. ‘Are you sure you want to erase the card?’
12. OK pb – press
13. ‘Formatting Card’
14. ‘Card format complete’
15. OK pb – press
16. CANCEL pb – press
DCS 760 EVA CAMR (Continued)

760 FULL FORMAT

1. Perform DCS BATT CHARGING (BATTS & FUSES)

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

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

   NOTE
   Formatting will take approx 20 min

14. ‘Formatting Card’ will be displayed w/progress bar
15. ‘Card format complete. No bad clusters found’
16. OK pb – press
17. CANCEL pb – press
DCS 760 EVA CAMR (Continued)

760 FIRMWARE UPDATE

PGSC

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

CAMR

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

NOTE
Process must be completed two times to update both Firmware slots

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

CREATING LOG FILE

1. MENU pb – press
2. Navigate pad – sel Menu icon , then MAIN MENU
3. OK pb – press
4. Navigate pad – sel 'Firmware'
5. OK pb – press
6. Navigate pad – sel 'Version'
7. OK pb – press
8. MENU pb – press, hold
9. OK pb – press
10. ‘Saving log file’ – displayed
11. ‘Log file saved’ – displayed (log file saved in root directory)
12. OK pb – press
13. Cancel pb – press twice to turn off display
14. Dnlk imagery and log file
DCS 760 EVA CAMR (Continued)

**BLANK IMAGE**

**CAMR SETTINGS – ACTIVATION**

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

- Install Body(Lens) Cap
- Pwr – ON
- Disk installed
- Rear LCD
  - Batt
  - Frames remaining sufficient
  - White Balance – Auto
- ISO – 100
- BKT disabled
- Focus Area – Center, LOCK displayed
- Exp Comp – 0.0
- Exp Mode – M
  - SS – 30
- AF Area Mode – [ ] (no “+”)
- Meter – Matrix
- Diopter – Adjust
- Film Adv – S
- Body Focus Mode – M
- Aperture – Min, locked (‘--‘ displayed on top LCD when no Lens installed)
- Flash Settings
  - ON/OFF – OFF

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

Mapping Views - Normal to surface
(2 in lateral offset per ft of range to surface)

Convergent Photos on each end

5-7 ft from surface

Additional row of mapping photos may be taken at a 90-60 deg angle to surface
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D2Xs EVA CAMR

SPECIFICATIONS

CAMR BODY

CMOS SENSOR SIZE: 15.7mm x 23.7mm
PIXEL COUNT: 4288 x 2848
DISK/FRAME: 1 GB, ~90 frames; 4 GB, ~360 frames
RAW FILE SIZE: ~10 MB
EXPOSURE CONTROL: Auto (program, shutter priority, aperture priority), Manual
METER PATTERN: 3D Color Matrix, Center Weighted, Spot
EXPOSURE COMP: ±5 in 1, 1/3, 1/2 EV steps
SHUTTER:
  Program & Aperture Priority – 1/8000 thru 30 sec (virtually stepless)
  Manual & Shutter Priority – 1/8000 thru 30 sec (1,1/3,1/2) stop increments), 250x, and Bulb (manual only)
ISO Setting: 100-3200; >800 controlled by menu
FRAME RATE: Single, CL – 3 fps, CH – 5 fps
Burst Rate: Mode dependent
CAMR BATT: Rechargeable Li-ION
CAMR BATT VOLTAGE: 11.1VDC
CAMR BATT LIFETIME: ~1000 frames
CAMR WEIGHT: 2.4 lb (w/Batt & Memory Card)
D2Xs EVA CAMR (Continued)

LENS DATA

**NOTE**
Do not use non-EVA lens w/D2Xs EVA

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<th>Approximate Field of View (FOV)</th>
<th>Approx Minimum Focus Distance (ft)</th>
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<td>f/2.8-f/22</td>
<td>46°</td>
<td>31°</td>
<td>54°</td>
<td>1.25</td>
<td>0.46</td>
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<tr>
<td>35mm AF</td>
<td>f/2.0-f/22</td>
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<td>25°</td>
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<td>0.9</td>
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<td>1.0</td>
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<td>1.72</td>
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D2Xs 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
13. Flap F
NOTE
When Camr not in use during EVA, Thermal Lens Cap must be installed

1. Unstow, assemble
   D2Xs Camr
   Lens – as reqd
   If 28(35,50,105)mm EVA Lens:
   √Circular Polar 52mm Filter w/o glass fully installed on lens
   D2Xs Batt – fully charged
   4 GB EVA Flash Card

2. Unstow but do not install
   EVA Camr Blanket
   Camr Mounting Assy w/Thermal Blanket and Tether
   EVA Eyepiece w/Thermal Wrap,Tether

3. Camr Settings
   Lens – as reqd
   Aperture – Min, locked
   Body Focus Mode – S
   √Batt installed
   √Flash Card installed
   Pwr – ON
   Top LCD
   √Batt
   √Frame count = 1
   If >1, perform D2Xs FORMAT, 2-22
   Exp Comp (■) – 0.0
   Exp Mode – P
   Meter – Matrix (▼)
   Diopter – Adjust
   Frame Rate – S
   √BKT disabled – 0 F
D2XS EVA CAMR (Continued)

D2XS EVA – CAMR ONLY (Continued)

D2XS

3. **Camar Settings** (Concluded)
   - Rear LCD
     - √ ISO – 100
     - √ QUAL – RAW
     - √ WB – 0,A
     - AF Area Mode – [ ]
     - √ Focus Area – Center
     - √ Focus Selector Lock – L
     - √ Vertical Shooting Shutter Release Lock – L
   - Menu Settings:
     - Menu pb – press
     - Navigate Pad sel – Playback Menu > Image Review
       - OFF
       - Setup Menu > Worldtime
     - √ Date/Time set to GMT
     - If reqd to set, perform DATE/TIME SET, 2-22

4. Close Eyepiece shutter
5. Remove IVA Eyepiece
6. Open Eyepiece shutter
7. Install EVA Camr Blanket starting at top of Camr
8. √ Lens Cap removed from Lens
9. Activate Shutter Release:
   - √ No “:EE” in Viewfinder
   - If “EE” displayed:
     - Remove Lens
     - Aperture – Min, locked
     - Replace Lens
   - √ Lens moves freely under EVA Camr Blanket
10. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
11. Install EVA Eyepiece
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR ONLY (Continued)

12. Thread Eyepiece Tether thru Hot Shoe openings on Camr Thermal Blanket
    Close Hot Shoe Cover

13. Loop Thermal Wrap thru Tether

14. Wrap Thermal Wrap around Eyepiece
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR ONLY (Concluded)

15. Install Camr Mounting Assy w/Thermal Blanket from rear
16. Camr Mounting Assy seated, will not slip off Camr. Release pb – out
17. Connect French Hook to D-Ring on left side of Camr

18. Stow Camr until day of EVA
If Remote Cord Assy used:
19. Connect Remote Cord Assy to Remote Release Port on D2Xs Camr (Connector will thread into place)

20. Remote Cord Assy not locked
21. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
22. Test fire D2Xs w/Remote Release
23. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
24. Stow until day of EVA
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR ONLY DISASSEMBLY

**BETWEEN EVAs**

**NOTE**
Removal of Batt, Card and Camr turnaround main objectives

1. Disconnect Tether from D-Ring
2. Detach Camr Mounting Assy from D2Xs Camr
3. Lift back EVA Camr Blanket to access Batt, Card compartments
4. Remove, replace:
   - D2Xs Batt
   - 4 GB EVA Flash Card
5. Re-install Camr Blanket
6. Install Camr Mounting Assy w/Thermal Blanket from rear
7. Camr Mounting Assy seated, will not slip off Camr. Release pb – out
8. Connect French Hook to D-Ring on left side of Camr

**FINAL CONFIGURATION**

9. Stow Camr until day of EVA
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR ONLY DISASSEMBLY (Concluded)

POST-EVA

NOTE
Removal of Batt, Card and stowing of EVA H/W and IVA use of D2Xs main objectives

1. Disconnect Tether from D-Ring
2. Detach Camr Mounting Assy and Thermal Wrap from D2Xs Camr
3. Disconnect Eyepiece Tether
4. Close Eyepiece shutter
5. Remove:
   EVA Eyepiece
   EVA Camr Blanket
   D2Xs Batt
   4 GB EVA Flash Card
6. Replace IVA Eyepiece
7. Open Eyepiece shutter

If reqd:
8. Return Camr to Nominal Ops
   Replace D2Xs Batt and 4 GB EVA Flash Card
Menu Settings:
   MENU pb – press
   Navigate Pad sel – Playback Menu ▶ > Image Review
     – ON
     – press twice
   Camr Pwr – OFF
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR W/FLASH

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

1. Unstow Install
   D2Xs Camr
   Lens – As Reqd
   If 28(35,50,105)mm EVA Lens:
   √Circular Polar 52mm Filter w/o glass fully installed on lens

   D2Xs Batt – fully charged
   4 GB EVA Flash Card

2. Unstow but do not install
   EVA Camr Blanket
   Camr Mounting Assy w/Thermal Blanket and Tether
   EVA Eyepiece w/Thermal Wrap and Tether
   Bracket Assy w/Thermal Blanket
   EVA Flash w/Thermal Blanket
   Flash Sync Cable Assy w/Thermal Blanket
   Remote Cord Assy (SED33112525-302)

D2Xs

3. Camr Settings
   Lens – as reqd
   Aperture – Min, locked
   Body Focus Mode – S
   √Batt installed
   √Flash Card installed
   Pwr – ON
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR W/FLASH (Continued)

D2Xs

3. Camr Settings (Concluded)
   Top LCD
   \( \checkmark \) Batt
   \( \checkmark \) Frame count = 1
     If >1, perform D2Xs FORMAT, 2-22
   Exp Comp ( \( \mathcal{P} \) ) – 0.0
   Exp Mode – P
   Meter – Matrix ( \( \mathcal{Y} \) )
   Diopter – Adjust
   Frame Rate – S
   \( \checkmark \) BKT disabled – 0 F
   Rear LCD
   \( \checkmark \) ISO – 100
   \( \checkmark \) QUAL – RAW
   \( \checkmark \) WB – 0,A
   AF Area Mode – [ [ ] ]
   \( \checkmark \) Focus Area – Center
   \( \checkmark \) Focus Selector Lock – L
   Menu Settings:
     Menu pb – press
     Navigate Pad sel – Playback Menu \( \mathcal{P} \) > Image Review
        – OFF
        – Setup Menu \( \mathcal{Y} \) > Worldtime
     \( \checkmark \) Date/Time set to GMT
        If reqd to set, perform DATE/TIME SET, 2-22

4. Close Eyepiece shutter
5. Remove IVA Eyepiece
6. Open Eyepiece shutter
7. Install EVA Camr Blanket starting at top of Camr
8. \( \checkmark \) Lens Cap removed from Lens
9. Activate Shutter Release:
   \( \checkmark \) No “EE” in Viewfinder
   If “EE” displayed:
     Remove Lens
     Aperture – Min, locked
     Replace Lens
   \( \checkmark \) Lens moves freely under EVA Camr Blanket
D2Xs EVA CAMR (Continued)
D2Xs EVA – CAMR w/FLASH (Continued)

10. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
11. Install EVA Eyepiece
12. Thread Eyepiece Tether thru Hot Shoe openings on Camr Thermal Blanket

13. Loop Thermal Wrap thru Tether

14. Wrap Thermal Wrap around Eyepiece
D2Xs EVA CAMR (Continued)

D2Xs EVA – CAMR w/FLASH (Continued)

15. Obtain Bracket Assy w/Thermal Blanket
    Brkt Assy
    If Thermal Blanket not installed, install on Bracket Assy
16. Insert Remote Cord Assy thru hole in Thermal Blanket (verify Remote Cord Assy not locked) and place lip of remote
    under Thermal Blanket

17. Remove Flash Sync Cover from Flash Sync Cable

18. Install Flash Sync Cable to Camr Hot Shoe:
    Lock Flash Sync Cable – turn lever cw
    Secure Camr Hot ShoeFlap to EVA Camr Blanket
19. Reinstall Flash Sync Cover onto Flash Sync Cable Assy
20. Install D2Xs Camr onto Bracket Assy (from front)
21. Install EVA Flash onto Bracket Assy (from rear)
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR W/FLASH (Continued)

22. Install Camr Mounting Assy w/Thermal Blanket to Bracket Assy (from rear)
23. √D2Xs Camr, EVA Flash, and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out
24. Connect French Hook to D-Ring on left side of Camr

EVA Flash
25. Open Flaps A,B,F
26. Under Flap B, tuck excess Remote Cord Assy (three coils) into pocket on EVA Flash unit
27. Close Flap B using two snaps

28. Connect Remote Cord Assy to Remote Release Port on D2Xs Camr (Connector will thread into place)

**NOTE**
Adjustments to cables may be reqd during installation

D2Xs
29. Connect Flash Sync Cable Assy to Flash Sync Port on EVA Flash

![Remote Cord Coil]
D2Xs EVA CAMR (Continued)

D2XS EVA – CAMR W/FLASH (Continued)

30. Close Flap A over Flash Sync Cable Assy, secure w/Velcro

31. Secure Flash Sync Cable and Remote Cord Assy under Flap F on right side of Flash

EVA Flash

32. Access Flash Batt Compartment (remove Flap(s) C as reqd)
33. Remove Batt Cap
34. Install one DCS 760 Batt into FLASH slot (align arrows)
35. Reinstall Batt Cap
36. Flash – ON
37. Activate Camr
38. Open Flap D; verify following:
   √ Mode – TTL/BL
   √ Zoom – “M” not displayed
   If “M” displayed, contact MCC

D2Xs
39. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
40. Test fire Camr w/Flash using Remote Release (two shots)
41. Flash fired

EVA Flash
42. Flash – OFF
43. Close Flap D
44. Remove DCS 760 Batt from FLASH slot

D2Xs
45. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
46. Stow until day of EVA

PRIOR TO ENTERING AIRLOCK:

If Camr only:
1. Remove 28mm Lens Cap
2. Activate Shutter Release:
   √ No “EE” in Viewfinder
   If “EE” displayed:
   Remove Lens
   Aperture – Min, locked
   Replace Lens
3. Test fire Camr
4. Install 28mm, 35mm, 50mm Lens Cap

~
D2XS EVA – CAMR W/FLASH (Concluded)

PRIOR TO ENTERING AIRLOCK: (Concluded)

~

If Camr w/Flash:

EVA Flash

5. Remove Batt Cap
6. Install DCS 760 Batt into Flash slot (align arrows)
7. Reinstall Batt Cap
8. Flash – ON
9. Activate Camr
10. Open Flap D; verify following:
    √ Mode – TTL
    √ Zoom – “M” not displayed
    If “M” displayed, contact MCC
11. Remove 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
12. Test fire Camr w/Flash
13. Install 28mm, 35mm, 50mm Lens Cap (Thermal Cap)
14. Flash – OFF
15. Close Flap D
16. Close Flap C
D2Xs EVA CAMR (Continued)

D2XS 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
5. Install Batt Cap
6. Close Flap C

CAMR

1. Disconnect Remote Cord Assy from D2Xs Camr
2. Disconnect Flash Sync Cable Assy from Camr Hot Shoe:
   Unlock Flash Sync Cable Assy – turn ccw
3. Disconnect French Hook from D-Ring
4. Detach D2Xs Camr from Bracket Assy
5. Lift back EVA Camr Blanket to access Batt, cord components
6. Remove, replace:
   D2Xs Batt
   4GB EVA Flash Card
7. Re-install Camr Blanket
8. Install D2Xs Camr onto Bracket Assy (from front)
9. √D2Xs Camr, EVA Flash, and Camr Mounting Assy seated, will not slip off Bracket Assy. Release pb – out
10. Connect French Hook to D-Ring on left side of Camr
11. Connect Remote Cord Assy to Remote Release Port on D2Xs Camr (Connector will thread into place)

NOTE
Adjustments to cables may be reqd during installation

D2Xs
12. Connect Flash Sync Cable Assy to Camr Hot Shoe
13. Lock Flash Sync Cable – turn lever cw
14. Re-install Flash Sync Cover onto Flash Sync Cable Assy
15. Stow until day of EVA
D2XS EVA – CAMR W/FLASH DISASSEMBLY (Continued)

POST-EVA

NOTE
Stowing of EVA H/W and IVA use of D2Xs main objective

CAMR W/FLASH

1. Disconnect Remote Cord Assy from D2Xs Camr
2. Disconnect Flash Sync Cable Assy from Camr Hot Shoe:
   Unlock Flash Sync Cable Assy – turn ccw
3. Disconnect French Hook from D-Ring
4. Detach Camr Mount, D2Xs Camr from Bracket Assy

CAMR

NOTE
Eyepiece shutter must be closed in order to remove Eyepiece

1. Disconnect Eyepiece Tether from Camr
2. Close Eyepiece Shutter
3. Remove:
   EVA Eyepiece
   EVA Camr Blanket
   D2Xs Batt
   4 GB EVA Flash Card
4. Replace IVA Eyepiece
5. Open Eyepiece shutter
D2Xs EVA CAMR (Continued)

D2Xs 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 Batt
4. Secure Batt Cap
5. Close Flap C
6. Open Flaps A,B,F
7. Disconnect Flash Sync Cable Assy from Flash
8. Remove Remote Cord Assy, Flash Sync Cable from Flap B
9. Close Flaps A,B,F
10. Remove EVA Flash from Bracket Assy
11. Remove Remote Cord Assy from Thermal Blanket
12. Stow all EVA H/W as reqd

RETURN CAMR TO NOM OPS (AS REQD)

1. Replace D2Xs Batt and 4 GB EVA Flash Card
2. Camr Settings:
   Camr Pwr sw – ON
   Menu Settings:
   MENU pb – press
   Navigate Pad sel – Playback Menu > Image Review – ON
   MENU pb – press twice
   Nom Ops settings
3. Camr Pwr – OFF
D2Xs EVA CAMR (Continued)

DATE/TIME SET

1. MENU pb – press
2. Navigate pad – sel 'Menu icon
   – press (right)
   – sel WORLD TIME (up,down)
   – press (right)
   – sel DATE (up,down)
   – press (right)
3. Set TIME/DATE to GMT
   Navigate pad – sel desired field (left,right)
   – sel desired setting (up,down)
4. ENTER pb – press
5. MENU pb – press twice

D2XS FORMAT

1. Pwr – ON
2. MENU pb – press
3. Navigate pad – set up MENU
   – sel ‘Format’
   – sel ‘Yes’
4. ENTER pb – press
5. ‘Formatting’
6. ‘Done’
7. MENU pb – press twice
D2Xs 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 – 35mm(28mm) 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
# EVA IR CAMR

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<td>6-17</td>
<td>6.6 MOVIE TRANSFER ERROR</td>
</tr>
</tbody>
</table>
EVA IR CAMR

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)
  EMISSIVITY RANGE: 0.01 to 1.0
  BATT: EHIP
  BATT VOLTAGE: 6V
  LENS FOV: 24°x18°
  POINTING LASER: Wavelength = 635nm
EVA IR CAMR (Continued)

NOMENCLATURE

1. Pointing Laser - Lower side of Baffle (not shown)
2. RCU Cable Strain Relief
3. EHIP Batt
4. EVA Knob (provides handhold for pointing)
5. STD Slide-Lock (holds remote during translation)
6. Lens Baffle
7. Lens
8. Access Cover
9. ENABLE sw
10. MASTER sw
11. Batt Status Indicator LED
12. Compact Flash Memory Card Access (Card secured w/latch (not shown))
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

6-5  P/TV/ALL/GEN I
EVA IR CAMR (Continued)

NOMENCLATURE (Continued)

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

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

- **E/M pb**
  - Push to enter functions or change parameters
  - Push, hold ~3 sec to enter Menu Mode

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

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

- **F/A and C/L pbs simo**
  - Push, hold simo ~3 sec to reset menu settings back to default parameters
EVA IR CAMR (Continued)

NOMENCLATURE (Concluded)

1. Ball Joint
2. Bracket Screws
3. Camr Interface
4. Tether Loop (two)
5. Dogbone Handrail
6. Cockable Bayonet
EVA IR CAMR (Continued)

CAMR SETUP

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

IR CAMR BRACKET ASSEMBLY

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

NOMINAL MENU SETTINGS

FILE (‘File’)

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

ANALYSIS (‘Analysis’)

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

IMAGE (‘Image’)

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

SETUP (‘Setup’)

Image…
  Adjust method – Histogram
  Lock scale – Off
  Lock value – blank
  Scale – On
  Status bar – On
  Saturation colours – Off
  Noise reduction – Off
  Shutter period – Normal

Other Settings
  Power…
    Auto power off – None
    Display power off – None
    LCD illumination – Medium
  Date/Time… – set per GMT
  Local Settings…
    Temp unit – °F
    Distance unit – Feet
    Date format – MM/DD/YY
  Camera info… – N/A
  Profile – N/A
  Factory default – N/A
EVA IR CAMR (Continued)

MOVIE RECORDING

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

MOVIE PLAYBACK

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

DOWNLINKING FILES

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

DELETING FILES

DELETE SINGLE FILES ON CF CARD

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

DELETE ALL FILES ON CF CARD

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

LEVEL/SPAN MODES

MANUAL ADJUST MODE

NOTE
In this mode, user adjusts level, span

1. E/M pb – push, hold
3. E/M pb – push

NOTE
C/L pb will change functionality of arrow pb.

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

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

CONTINUOUS ADJUST MODE

NOTE
In this mode, Camr automatically adjusts level, span

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

DATE/TIME SET

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

SELECTING DIFFERENT PALETTES

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

RESET TO NASA PROFILE

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

DEACTIVATION

1. √All images transferred to CF card
2. ENABLE sw – OFF (hold for 3 sec)
3. MASTER sw – OFF
4. Lens Cover – cl
Flashing red & green LED indicates that 75% of Batt has been used.

ENABLE sw is a momentary sw.
IR CAMR

6.2 RCU pbs NOT RESPONDING

RCU pbs Not Responding

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

No

3.  
Continue nominal ops

4.  
MCC

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

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?
     - Yes
     - No

8. MCC
   - Yes

9. Continue nominal ops

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

ENABLE sw is a momentary sw
IR CAMR Will Not Record

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

1

- Press and release S/T pb
Does Camr record?
Yes

2

- Is RAM full?
✓ (‘0’ displayed on left-hand side of focus distance)
No

3

- Transfer movies to CF Card
Can a movie be recorded?
Yes

4

- ENABLE sw – up (hold 3 sec)
- ENABLE sw – up (wait 10 sec)
Can a movie be recorded?
No

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

5

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

6

- 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

7

- Continue nominal ops

8

✓ MCC
6.5 WHITE LCD WITH “HOT” TEXT

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

1. Point RCU toward dark space (wait 30 sec)
   Is "HOT" msg still displayed?
   Yes → 2
   No

   2. MCC

   3. Continue nominal ops
If CF Card not properly installed, Burst record settings are not configurable via menu.

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. Is there a movie in RAM? (Number between 0-599 displayed on left-hand side of focus distance)
   Yes
   No

2. Press and hold S/T pb 3 sec
   Is “Error storing movie” displayed?
   Yes
   No

3. Is “Disk Full” displayed?
   Yes
   No

4. Can a movie be recorded?
   Yes
   No

5. Determine camr location
   EVA
   IVA

6. 

7. Take CF Card out of Camr
   Transfer files to PGSC
   Once complete, delete files on CF Card
   Install CF Card in Camr
   Can movie be transferred?
   Yes
   No

8. Is CF Card installed properly?
   Yes
   No

9. ENABLE sw – up (hold for 3 sec)
   ENABLE sw – up (wait 10 sec)

10. Re-install CF Card

11. Can movie be transferred?
   Yes
   No

12. Continue nominal ops

13.
13 Has step 9 been previously performed?

   Yes

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

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

   Can a movie be recorded and transferred?

   Yes

   15 • Continue nominal ops

   No

   16 • √MCC
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<td>DIGITAL PAO CC</td>
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<td>PD100 TO V10 VIA FIREWIRE</td>
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<td>PD100 TO V10 VIA ORBITER TV SYSTEM</td>
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<td>SINGLE CAMCORDER w/CAMCORDER MICROPHONE</td>
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SONY PD100

SPECIFICATIONS

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

WIDE ANGLE CONVERTER

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

LENS DATA

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<th>Lens</th>
<th>Zoom Ratio</th>
<th>Approximate Field of View</th>
<th>Filter Size</th>
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<td>4.3-51.6mm</td>
<td>12:1</td>
<td>61.1°-5.6°</td>
<td>52mm</td>
</tr>
<tr>
<td>w/Wide Conversion Lens</td>
<td>12:1</td>
<td>80.3°-8.0°</td>
<td>N/A</td>
</tr>
<tr>
<td>3.0-36mm</td>
<td></td>
<td>64.7°-6.0°</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>93.1°-10.0°</td>
<td></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. FADER pb
7. BACK LT pb
8. EDIT/SEARCH pb
9. Viewfinder Lens Adjustment Lever
10. PHOTO pb
11. BATT RELEASE pb
12. SHUTTER SPEED pb
13. WHT BAL (White Balance) pb
14. POWER SUPPLY RELEASE pb
15. POWER sw
16. START/STOP pb
17. PROGRAM AE pb
18. EXPOSURE pb
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)
   - II PAUSE (pause)
   - ● REC (record)
4. Zoom Control
5. TC RESET pb
6. Viewfinder
7. Display Window
8. FOCUS sw
9. PUSH AUTO pb
10. Memory Release pb (not visible)
11. Built-in Microphone
12. REC Lamp
13. Remote Sensor
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
### NOMINAL MENU SETTINGS

#### CAMR MODE

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<th>VTR SET</th>
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<td>AUTO SHUTTER – ON</td>
<td>HiFi SOUND – STEREO</td>
</tr>
<tr>
<td>PROG SCAN – OFF</td>
<td>AUDIO MIX – “left” (ST1)</td>
</tr>
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</table>

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<thead>
<tr>
<th>CAMR SET</th>
<th>LCD/VF SET</th>
</tr>
</thead>
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<tr>
<td>D.ZOOM – OFF</td>
<td>LCD B.L. – BRT Normal</td>
</tr>
<tr>
<td>16:9 WIDE – OFF</td>
<td>LCD COLOR – “center”</td>
</tr>
<tr>
<td>STEADYSHOT – ON</td>
<td>VF BRIGHT – “center”</td>
</tr>
<tr>
<td>AE SHIFT – “center”</td>
<td></td>
</tr>
<tr>
<td>GAIN SHIFT – 0dB</td>
<td></td>
</tr>
<tr>
<td>FRAME REC – OFF</td>
<td></td>
</tr>
<tr>
<td>INT REC – OFF</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LCD/VF SET</th>
<th>CM SET</th>
</tr>
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<tbody>
<tr>
<td>LCD B.L. – BRT Normal</td>
<td>N/A</td>
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<tr>
<td>LCD COLOR – “center”</td>
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</tr>
<tr>
<td>VF BRIGHT – “center”</td>
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<table>
<thead>
<tr>
<th>CM SET</th>
<th>TAPE SET</th>
</tr>
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<tbody>
<tr>
<td>N/A</td>
<td>AUDIO MODE – FS48K (non-default)</td>
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<table>
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<tr>
<th>TAPE SET</th>
<th>SETUP MENU</th>
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<tbody>
<tr>
<td>AUDIO MODE – FS48K</td>
<td>LTR SIZE – NORMAL</td>
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<tr>
<td>(non-default)</td>
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<tr>
<td>MIC LEVEL – AUTO</td>
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<tr>
<td>[@@] REMAIN – ON</td>
<td></td>
</tr>
<tr>
<td>(non-default)</td>
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<tr>
<td>TIME CODE – DF</td>
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</table>

<table>
<thead>
<tr>
<th>SETUP MENU</th>
<th>OTHER</th>
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<tbody>
<tr>
<td>CLOCK SETUP – set to GMT</td>
<td>BEEP – NORMAL (non-default)</td>
</tr>
<tr>
<td>LTR SIZE – NORMAL</td>
<td>COMMANDER – ON</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>OTHER</th>
<th>DISPLAY – LCD</th>
</tr>
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<tbody>
<tr>
<td>WORLD TIME – 0 HR</td>
<td></td>
</tr>
<tr>
<td>BEEP – NORMAL</td>
<td></td>
</tr>
<tr>
<td>(non-default)</td>
<td></td>
</tr>
<tr>
<td>COMMANDER – ON</td>
<td></td>
</tr>
<tr>
<td>DISPLAY – LCD</td>
<td></td>
</tr>
<tr>
<td>REC LAMP – OFF</td>
<td></td>
</tr>
<tr>
<td>(non-default)</td>
<td></td>
</tr>
<tr>
<td>COLOR BAR – OFF</td>
<td></td>
</tr>
</tbody>
</table>

### VTR MODE

<table>
<thead>
<tr>
<th>VTR SET</th>
<th>LCD/VF SET</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiFi SOUND – STEREO</td>
<td>LCD B.L. – BRT Normal</td>
</tr>
<tr>
<td></td>
<td>LCD COLOR – “center”</td>
</tr>
<tr>
<td></td>
<td>VF BRIGHT – “center”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LCD/VF SET</th>
<th>CM SET</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD B.L. – BRT Normal</td>
<td>N/A</td>
</tr>
<tr>
<td>LCD COLOR – “center”</td>
<td></td>
</tr>
<tr>
<td>VF BRIGHT – “center”</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CM SET</th>
<th>TAPE SET</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>AUDIO MODE – FS48K (non-default)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TAPE SET</th>
<th>SETUP MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUDIO MODE – FS48K (non-default)</td>
<td>LTR SIZE – NORMAL</td>
</tr>
<tr>
<td>MIC LEVEL – AUTO</td>
<td></td>
</tr>
<tr>
<td>[@@] REMAIN – ON</td>
<td></td>
</tr>
<tr>
<td>(non-default)</td>
<td></td>
</tr>
<tr>
<td>TIME CODE – DF</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SETUP MENU</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTR SIZE – NORMAL</td>
<td>BEEP – NORMAL (non-default)</td>
</tr>
<tr>
<td></td>
<td>COMMANDER – ON</td>
</tr>
<tr>
<td></td>
<td>DISPLAY – LCD</td>
</tr>
<tr>
<td></td>
<td>DV EDITING – N/A</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
√A displayed
CONTROL tw – press
Adjust aperture as reqd
To exit Aperture:
   PROGRAM AE pb – press
   √No A displayed
SONY PD100 (Continued)

ANALOG PAO CC

Config H/W per dwg at right
AVIU
   SYNC/VIDEO – VIDEO
   HI-Z/75 – 75
   PWR SELECT – LO
O19(MO58F)
   √TV PWR – ON
CC
   √Wide Conversion lens installed
   If rec to tape:
      Tape – Install
   √Viewfinder (LCD) displays STBY
   If live event:
      Tape – Remove
   √Viewfinder (LCD) displays blinking yellow tape
Camer Settings
   √AUTO LOCK – AUTO LOCK
   √FOCUS – AUTO
   Install Audio Muting Plug (optional)
   Multiuse Brkt, Clamp
F1(MO52J)
   AC UTIL PWR AC1 – ON
Photoflood
   ON/OFF – ON
   HI/LO – HI
Cabin Lts
   Flt Deck – ON
   Lts in FOV – OFF as reqd
   Lt Shades – install as reqd
   Window Shades – install as reqd
CC
   √Scene composition
   Adjust Camr angle for best framing
CCU
   CCU PWR – ON
ATU
   PWR – AUD
   A/G 1(2) – T/R
   All Other Loops – OFF
   XMIT/ICOM MODE SEL – PTT/PTT
   MSTR SPKR VOL SEL – as reqd
   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

FOR PAO EVENTS

AC UTIL PWR
   AC1
   F1(MO52J)

Photoflood

Handheld Mic

FD(MD) PAO TV Pwr Cable (10 ft)
   (2293284–504, 528–20650–1)

FLTDECK(MIDDECK)
   O19(MO58F)

(W6 or In-Cabin)

Digital CC Vid/Pwr Cable (15 ft)
   (SE39111490–303)

A/V Adapter Cable
   (SEZ16103275–301)

RCA Barrel Adapter

Multiuse Arm

Audio Muting Plug (Optional)
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

Scene composition

   Adjust Camr angle for best framing

CC   Scene composition

   Handheld Mic

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

FOR PAO EVENTS
CC BATT CHARGING

1. Config H/W per dwg below

AVIU

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

NOTE
When batt charger not in use, remove pwr

O19

3. √TV PWR – ON

4. Insert Batt in charger. Check charger LED for charge status (~2 hr)
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

---

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

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

DTV IEEE 4–4 Pin Cable
(SDZ16103652–801)
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
SONY PD100 (Continued)

PD100 TO V10 VIA ORBITER TV SYSTEM

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

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

O19(MO58F) √ TV PWR – ON

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

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

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

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-25 VTR

Config H/W per dwg at right

L10 (MUX)  \( \sqrt{\text{VTR/CC PWR – on (LED on)}} \)  (VTR)
ON/STANDBY pb – push (green LED on)
INPUT SELECT – 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 – VIDEO
Remove, mark tape
ON/STANDBY pb – push (red LED on)
Remove, stow IEEE 1394 female cable
(VMUX)  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)

DTV IEEE 1394 4–Pin to Female Circ Cable
(SDZ16103651–801)
SONY PD100 (Concluded)

SINGLE CAMCORDER w/CAMCORDER MICROPHONE

Config H/W per dwg at right

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

O19(MO58F)  √TV PWR – ON

CC  
√Wide Conversion Lens installed  
PWR – CAMERA  
Tape – Install  
√Viewfinder(LCD) displays STBY  
Camr Settings  
√AUTO LOCK – AUTO LOCK  
√FOCUS – AUTO  
Multiuse Brkt, Clamp

Lav Mic  ON/OFF – ON

F1(MO52J)  AC UTIL PWR AC1 – ON

Photoflood  ON/OFF – ON  
HI/LO – HI

Cabin Lts  Flt Deck(Middeck) – ON  
Lts in FOV – Off as reqd  
Lt Shades – install as reqd

CC  
√Scene Composition  
Adjust Camr for best framing  
√Audio Quality
# CANON G1

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<tr>
<td>Single Camcorder W/Camcorder Microphone</td>
<td>7A-24</td>
</tr>
</tbody>
</table>
CANON G1

SPECIFICATIONS

IMAGE SENSOR: 1/3-in CCD x 3 (1,670,000 pixels)
ZOOM: 20X Optical Zoom, 4.5-90mm (32.5-650mm, 35mm in Photo Equivalent)
VIDEO RECORDING SYSTEM:
  HDV – High Definition Video 1080i
  DV – Standard Definition Video 480i
AUDIO RECORDING SYSTEM:
  HDV – MPEG-1, 16 bit (48kHz)
  DV – PCM Digital Sound, 16 bit (48kHz) or 12 bit (32kHz)
TAPE FORMAT: Mini DV Cassette (Mini DVCAM acceptable)
MAXIMUM RECORDING TIME:
  HDV – 60 min
  DV: SP – 60 min; LP – 90 min
VIEWFINDER: 0.57-in wide, 16:9 aspect ratio TFT Color; ~269,000 pixels
LCD SCREEN: 2.8-in wide, 16:9 aspect ratio TFT Color; ~207,000 pixels
MICROPHONE: Stereo Electret, Cross-layout
AF SYSTEM: Autofocus, Manual Focusing w/Focus Ring
WHITE BALANCE: Auto White Balance, Preset, Custom, Manual
MINIMUM ILLUMINATION: 0.4 lx (1/3 Shutter, F1.6, Gain 18 dB)
IMAGE STABILIZATION: Optical Shift Image Stabilizer
POWER: 7.2V Batt Pack, 8.4V DC In
BODY WEIGHT: 4.6 lb
BATT LIFETIME: ~90 min
BATT WEIGHT: 0.41 lb
WIDE ANGLE CONVERTER:
  CONVERSION – 0.8X
  CONVERTED FOCAL LENGTH – 3.6-72mm
  WEIGHT – 1.60 lb

LENS DATA

<table>
<thead>
<tr>
<th>Lens</th>
<th>Zoom Ratio</th>
<th>Approximate Field of View</th>
<th>Filter Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
</tr>
<tr>
<td>4.5-90mm</td>
<td>20:1</td>
<td>58°-3.2°</td>
<td>40.5°-2.1°</td>
</tr>
<tr>
<td>w/Wide Conversion Lens</td>
<td>20:1</td>
<td>69.4°-4.0°</td>
<td>49.5°-2.6°</td>
</tr>
<tr>
<td>3.6-72mm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CANON G1 (Continued)

NOMENCLATURE

CAMCORDER – TOP VIEW

1. LOCK sw
2. Start/Stop pb
3. Grip Zoom
4. OPEN/EJECT sw ▲
5. PHOTO pb
6. Zoom Speed Adjustment Dial
7. RESET pb
8. MIC ATT sw
9. WHITE BAL PRESET sw
10. END SEARCH pb
11. Strap Mount
12. • REC pb
13. FAST FWD pb
14. PLAY pb
15. REW pb
16. STOP pb
17. PAUSE pb
18. PHOTO pb
19. Handle Zoom
20. Strap Mount
21. Hot Shoe
22. Microphone

7A-3

P/TV/ALL/GEN I,5
CANON G1 (Continued)

NOMENCLATURE (Continued)

CAMCORDER – LEFT SIDE FRONT SECTION

1. ND FILTER sw
2. POSITION PRESET sw
3. POSITION PRESET ON/SET sw
4. DISP. (Display) pb
5. PEAKING pb
6. MAGN. (Magnification) pb
7. (Record Review) pb
8. Focus Mode sw
9. EXP. LOCK pb
10. SHUTTER/Ktw
11. PUSH AF pb
12. Aperture Ring
13. Zoom Ring
14. Focus Ring
CANON G1 (Continued)

NOMENCLATURE (Continued)

CAMCORDER – LEFT SIDE REAR SECTION

1. AGC sw (Automatic Gain Control)
2. AWB sw (Automatic White Balance)
3. Side Panel Display
4. POWER Indicator
5. POWER Dial
6. OPEN sw (open the LCD display)
7. AUDIO CH1/CH2 Dials
8. SELECT/SET Dial
9. AUDIO LEVEL sw
10. MENU pb
11. CUSTOM PRESET SELECT pb
12. CUSTOM PRESENT ON/OFF pb
13. CUSTOM KEY pb
14. WHITE BAL pb (White Balance)
15. WHITE BAL sw
16. OUTPUT sw
17. GAIN sw
CANON G1 (Continued)

NOMENCLATURE (Continued)

CAMCORDER – PWR DIAL

- EXT. CONT.
- VCR/PLAY
- OFF
- A
- TV
- Av
- M
- Manual
- Spotlight
- Night
- Easy Recording

External Control Mode
VCR/PLAY Mode
Power Off
Auto
Shutter Priority
Aperture Priority
CANON G1 (Continued)

NOMENCLATURE (Continued)

CAMCORDER – RIGHT SIDE

1. V2 Terminal
2. ZOOM SPEED sw
3. Card/Tape sw
4. Zoom Speed Adjustment Dia
5. PHOTO pb
6. Grip Zoom
7. LOCK sw
8. MIC (External Microphone) Terminal
9. XLR MIC ATT. sw
10. LINE/MIC sw
11. Input Channel Selection sw
12. 48V sw
13. CH1 Input Terminal
14. CH2 Input Terminal
15. Cassette Compartment
16. TIME CODE sw
CANON G1 (Continued)

NOMENCLATURE (Continued)

CAMCORDER – BACK VIEW

1. Battery/Memory Card Compartment
2. BATT. RELEASE Latch
3. Battery Attachment Unit
4. Memory Card Slot
5. OPEN sw (Battery Compartment)
6. CARD Access Indicator
7. Dioptic Adjustment Lever
8. Viewfinder
9. \( \mathcal{H} \) Terminal
10. HDW/DV Terminal
11. HDV Indicator
12. Start/Stop pb
13. Standby/Lock Lever
14. HD/SD SDI Terminal
15. GENLOCK Terminal
16. TIME CODE Terminal
17. A/V1/V2 sw
18. A/V1 Terminal
19. COMPONENT OUT Terminal
20. Headphones Terminal
CANON G1 (Continued)

NOMENCLATURE (Concluded)

CAMCORDER – FRONT VIEW

1. Grip Belt
2. Instant AF External Sensor
3. Tally Lamp
4. Remote Sensor
CANON G1 (Continued)

NOMINAL MENU SETTINGS

CAMR MENU (* – non-default)

**SIGNAL SETUP**
- TIME CODE
  - FRAME SETTING – DROP
  - COUNT-UP – REC-RUN
  - GENLOCK ADJUST – 0000
- SIGNAL STD – HD
- FRAME RATE – 60i
- COMP. OUT – 1080i/480i
- SDI OUTPUT – OFF
- SPEC. – AUTO

**CAMERA SETUP**
- AE SHIFT – ±0
- GAIN SETTING
  - GAIN L – ±0dB
  - M – 6dB
  - H – 12dB
- AF MODE – NORMAL AF*
- IMG STAB – ON ((     ))
- EFFECT LEVEL – OFF
- SKY DETAIL – OFF
- COLOR CORR.
  - CORRECT – OFF
- F SPEED PSET – HIGH

**RECORDING SETUP**
- DV REC MODE – SP (Standard Definition Mode Only)
- UB REC – INT. USR-BIT
  - SELECT – 00 00 00 00
- IMG QUALITY – FINE
- IMAGE SIZE – LW1920x1080
- FILE NOS. – CONTINUOUS

**AUDIO SETUP**
- DV AUDIO – 16 bit (Standard Definition Mode Only)
- AUD. M. SET – NORMAL
- MIC MODE – NORMAL
  - SENS. – NORMAL
- XLR INPUT – OFF
  - GAIN UP – OFF

**DISPLAY SETUP**
- CVF SETUP
  - BRIGHTNESS – mid
  - CONTRAST – mid
  - COLOR – mid
  - SHARPNESS – mid
  - BACKLIGHT – NORMAL
- LCD SETUP
  - BRIGHTNESS – mid
  - CONTRAST – mid
  - COLOR – mid
  - SHARPNESS – mid
  - BACKLIGHT – NORMAL
- CVF+LCD BW – OFF
  - ON – OFF
- LANGUAGE – ENGLISH
- MARKERS – OFF
- ASPECT GUIDE – 4:3*
- SAFETY ZONE – OFF
- ZEBRA – OFF
  - LEVEL – 85
- TV SCREEN – OFF*
- AUDIO LEVEL – ON
- GUIDE INFO – CUSTOM KEYS
- UB DISPLAY – OFF
CANON G1 (Continued)

NOMINAL MENU SETTINGS (Continued)

CAMR MENU (* – non-default) (Continued)

SYSTEM SETUP
CUSTOM KEY 1 – SHTR D.LOCK*
   2 – (NONE)*
D/TIME SET
   T.ZONE/DST – LONDON*
   DATE/TIME – ‘GMT’*
   DATE FORMAT – ‘M.D.Y.TIME’
DV CONTROL – OFF
MAGN. B. LOCK – ACTIVE*
SHTR D. LOCK – DISABLED
RESET ALL – NO

CUSTOMIZE
CUSTOM PRESET (Continued)
CUSTOM PRESET (Concluded)
   RG MATRIX – 2*
   RB MATRIX – 0
   GR MATRIX – 0
   GB MATRIX – 1*
   BR MATRIX – 0
   BG MATRIX – -4*

FUNCTION – C Fn1 Active*

SETTING ITEMS
   00 SHCKLSS WB/GN – 00
   01 AE RESPONSE – 00
   02 HIGH-SPEED ZOOM – 00
   03 FOCUS RING CTRL – 01*
   04 BUTTONS OPER. – 00
   05 RINGS DIRECTION – 00
   06 DIALS DIRECTION – 00
   07 FOCUS PRIORITY – 00
   08 SIMULT. IMG. REC – 00
   09 MARKER LEVEL – 00
   10 F. AST BW-MOD – 00
   11 OBJ DST UNIT – 00
   12 ZOOM INDICATOR – 00
   13 COLOR BARS – 00
   14 1kHz TONE – 00
   15 WIRELESS REMOTE – 00
   16 POWER SAVE – 01*
   17 TALLY LAMP – 02*
   18 LED – 00
   19 BEEP – 00
   20 CHARACTER REC – 00
CANON G1 (Continued)

NOMINAL MENU SETTINGS (Continued)

CAMR MENU (Concluded)

CUSTOMIZE (Concluded)
CUSTOM DISPLAY
SETTING ITEMS (*non-default)
00 REC PROGRAMS – 01
01 CAMERA DATA1 – 03
02 CAMERA DATA2 – 07
03 ZOOM – 01
04 FOCUS – 02*
05 ND – 01
06 IMAGE EFFECTS – 07
07 F. ASSIST FUNC. – 03
08 CUSTOMIZE – 03
09 RECORDING STD – 01
10 DV REC MODE – 00
11 FRAME RATE – 01
12 TAPE – 03
13 TAPE REMAINDER – 01*
14 TAPE/CARD – 02*
15 LIGHT METERING – 03
16 CARD – 03
17 CARD REMAINDER – 02
18 AUDIO – 00
19 CONDENSATION – 01
20 BATTERY – 01*
21 WIRELESS REMOTE – 02

VCR MENU (* – non-default)

SIGNAL SETUP
TIME CODE
FRAME SETTING – DROP
COUNT-UP – REC RUN
HDV/DV IN – REGEN.
PLAYBACK STD – AUTO
COMP. OUT – 1080i/480i
SDI OUTPUT – OFF
SPEC. – AUTO
AV->DV – OFF
HD DOWN-CONV – ON
LETTERBOX – OFF

RECORDING SETUP
DV REC MODE – SP
UB SELECT — 00 00 00 00
IMG QUALITY – FINE
HD IMG SIZE — LW1920x1080
FILE NOS. – CONTINUOUS

AUDIO SETUP
SEL AUDIO CH – CH1/3 / CH2/4
AUD. M. SET – CH1/2
DV AUDIO – 16 bit
CANON G1 (Continued)

NOMINAL MENU SETTINGS (Concluded)

VCR MENU (* – non-default) (Concluded)

DISPLAY SETUP
CVF SETUP
  BRIGHTNESS – mid
  CONTRAST – mid
  COLOR – mid
  SHARPNESS – mid
  BACKLIGHT – NORMAL

LCD SETUP
  BRIGHTNESS – mid
  CONTRAST – mid
  COLOR – mid
  SHARPNESS – mid
  BACKLIGHT – NORMAL

CVF+LCD BW – OFF
  ON- OFF

TV SCREEN – OFF

AUDIO LEVEL – ON

LANGUAGE – ENGLISH

CUSTOM KEY – OFF

DATA CODE – DATE & TIME

6SEC. DATE – OFF

UB DISPLAY – OFF

SYSTEM SETUP

CUSTOM KEY 1 – TV SCREEN
  2 – DATA CODE

D/TIME SET
  T.ZONE/DST – LONDON
  DATE/TIME – ‘GMT’
  DATE FORMAT – ‘M.D.Y.TIME’

RESET ALL – NO

CUSTOM FUNCTION – C.FN1

SETTING ITEMS (*NON-DEFAULT)

00 SHCKLSS WB/GN – 00
01 AE RESPONSE – 00
02 HIGH-SPEED ZOOM – 00
03 FOCUS RING CTRL – 01*
04 BUTTONS OPER. – 00
05 RINGS DIRECTION – 00
06 DIALS DIRECTION – 00
07 FOCUS PRIORITY – 00
08 SIMULT.IMG.REC – 00
09 MARKER LEVEL – 00
10 F. AST BW-MOD – 00
11 OBJ DST UNIT – 00
12 ZOOM INDICATOR – 00
13 COLOR BARS – 00
14 1kHz TONE – 00
15 WIRELESS REMOTE – 00
16 POWER SAVE – 01*
17 TALLY LAMP – 02*
18 LED – 00
19 BEEP – 00
20 CHARACTER REC – 00
MANUAL SETTINGS

FOCUS

MANUAL FOCUS
- PWR dial – A (Tv,Av,M, , )
- AF/M sw – MANUAL (MF display in viewfinder (LCD))
- Zoom – IN to subject
- Focus manually
- Zoom to desired setting
- Begin recording as reqd

TEMP AUTO FOCUS
- PUSH AF pb – press, hold for temp Auto Focus

SHUTTER SPEED
- PWR dial – A (Tv,M)
- If A , EXP.LOCK pb – push
- SHUTTER/K tw – rotate to select SS from 1/4 to 1/15,000 sec, CS
- If A , to exit Shutter Speed:
  - EXP.LOCK pb – push
  - No SS displayed

WHITE BALANCE
- PWR dial – A (Tv,Av,M, , )
- AWB – OFF
  - WHITE BAL – A(B,PRE)
- For A(B):
  - To set WHT BAL, place white sheet of paper in CC FOV (under same lighting conditions)
  - tw – push
  - White Balance icon A(B) will blink for 2 sec and become steady

WHITE BALANCE (Concluded)

  For PRE:
  - WHITE BAL PRESET – ( , K )
  - For K:
    - pb – push (flashing #K)
    - SHUTTER/K tw – rotate to desired color temperature

APERTURE
- PWR dial – A (Av,M)
- If A , EXP.LOCK pb – push
  - Aperture Ring – rotate to select AP from F1.6 to F9.5
- PROGRAM AE pb – press
- If A , to exit Aperture:
  - EXP.LOCK pb – push
  - No F# displayed

GAIN
- PWR dial – A (Tv,Av,M)
  - AGC – OFF
  - GAIN – L(M,H) as reqd
  - +/- dB displayed on LCD(Viewfinder)
CANON G1 (Continued)

ANALOG CC REC,DNLK

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
- √ ND FILTER – OFF
- Install Audio Muting Plug (optional)
- √ OUTPUT – CAM
- √ A/V1/V2 – V2
- √ STANDBY/Lock – STANDBY
- PWR dial – “green”
- If rec to tape:
  - Tape – Install
  - Viewfinder (LCD) displays “green”
- Multiuse Brkt, Clamp

F1(MO52J)
- AC UTIL PWR AC1 – ON

PhotoFlood
- ON/OFF – ON
- HI/LO – HI
- If Worklights:
  - ON/OFF – ON

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

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

FOR PAO EVENTS

If Worklights:
- Handheld Mic
- RCA-BNC Adapter
- Wide Conversion Lens

If Floodlight:
- Loc-Line (w/Clamp)
- AC UTIL PWR AC1
- F1(MO52J)
- TV
- Handheld Mic
- RCA-BNC Adapter
- Wide Conversion Lens
- Audio Muting Plug (Optional)

FD(MD) PAO TV Pwr Cable (10 ft)
(2293284–504, 528–20650–1)

CCU
CANON G1 (Continued)

ANALOG CC REC, DNLK (Concluded)

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 for dnlk:

A7
√ TV DNLK – ENA
  TV PWR CNTL – PNL
  TV PWR CONTR UNIT – MNA(B)
  TV PWR CNTL – CMD (wait 10 sec for system initialization)
  VID OUT DNLK pb – push
  VID IN FLT DECK(MIDDECK) pb – push
CANON G1 (Continued)

HD DIGITAL CC DNLK

Notify MCC, configuring for HD TV dnlk

Config H/W per dwg at right

CC
For cable strain relief attach MPC-to-G1 Cable
Velcro strap to CC strap

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

O19
√ TV PWR – ON

CC
√ Wide Conversion Lens installed
Install LAV MIC
√ ND FILTER – OFF
√ OUTPUT – CAM
√ [ ] OFF
√ STANDBY/LOCK – STANDBY

PWR dial – "green"

Mount Camcorder

L10 (MUX)
√ MUX/VTR/CC PWR – off (LED off)
√ VTR/CC/PWR – off (LED off)
Disconnect CHANNEL 3 IEEE 1394 Cable
MUX/VTR/CC PWR – on (LED on)
MUX BYPASS – ACT
CHANNEL 0,1 RATE SEL – 1
sqrt 2 RATE SEL – 8

O19
DC UTIL PWR MNA – ON

MPC PWR
DC PWR SPLY PWR SW1 – ON

SPLY
MPC
PWR-ON (HDV, TAXI, 5V, 3V green LEDs on)
HD DIGITAL CC DNLK (Concluded)

L10 (MUX) \(\sqrt{\text{CHANNEL 2 F/O OK, DATA LEDS on}}\)

If Photoflood:
- F1 (MO52J) \(\text{AC UTIL PWR AC1 – ON}\)
- PhotoFlood \(\text{ON/OFF – ON}\)
  \(\text{HI/LO – HI}\)
If Worklights:
- Worklights \(\text{ON/OFF – ON}\)
- Photoflood \(\text{ON/OFF – ON}\)
  \(\text{HI/LO – HI}\)
- Cabin Lts \(\text{Ft Deck – ON}\)
  \(\text{Lts in FOV – OFF as reqd}\)
  \(\text{Lt Shades – install as reqd}\)
  \(\text{Window Shades – install as reqd}\)

CC \(\sqrt{\text{Scene composition}}\)
- Adjust Camr angle for best framing

LAV MIC \(\text{PWR – ON (talk), OFF (listen)}\)

When dnlk complete:
- CC \(\text{PWR dial – OFF}\)
- O19 \(\text{TV PWR – OFF as reqd}\)
- MPC \(\text{PWR – OFF}\)
  \(\text{DC PWR SPLY PWR SW1 – OFF}\)
- O19 \(\text{DC UTIL PWR MNA – OFF}\)
- L10 (MUX) \(\text{MUX/VTR/CC PWR – off (LED off)}\)
  \(\text{Connect CHANNEL 3 IEEE 1394 Cable}\)
  \(\text{Notify MCC, returned to SD TV dnlk}\)
  \(\text{Go to DEACTIVATION (Cue Card, TV) as reqd}\)
CANON G1 (Continued)

CC BATT CHARGING

1. Config H/W per dwg below

AVIU 2. SYNC/VIDEO – VIDEO
    HI-Z/75 – 75
    PWR SELECT – HI

NOTE
When batt charger not in use, remove pwr

O19 (MO58F) 3. √TV PWR – ON

4. Insert Batt in charger. Check charger LED for charge status (~2 hr)
CANON G1 (Continued)

G1 TO G1 VIA FIREWIRE

Config H/W per dwg at right

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

PLBK CC  
PWR dial – VTR/PLAY  
Install source tape. Protect Tab – slide (red visible)  
Cue tape to desired take via FF(REW) pb  
PLAY pb – push  
∥ pb – push

RCD CC  
PWR dial – VTR/PLAY  
Install new tape  
REC pb – push  
∥ pb – push

Perform following for each video segment:

PLBK CC  
∥ pb – push (To PLAY)  
RCD CC  
∥ pb – push (To REC)  
When EDIT segment complete:

PLBK CC  
∥ pb – push (PAUSE)  
RCD CC  
∥ pb – push (PAUSE)

When complete:

STOP pb – push simo  
Cue to next starting point and repeat as reqd
CANON G1 (Continued)

G1 TO V10 VIA FIREWIRE

Config H/W per dwg at right

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

CC  
PWR dial – VTR/PLAY  
Disconnect DTV IEEE 4-4 Pin Cable  
MENU pb – push  
SELECT/SET:  
Sel ‘SIGNAL SETUP’  
HD DOWN-CONV – ON  
MENU pb – push  
Reconnect DTV IEEE 4-4 Pin Cable  
Install source tape. Protect Tab – slide (red visible)

Cue tape to desired take via FF(REW) pb  
PLAY pb – push  
|| pb – push

V10  
PWR – ON  
DISPLAY pb – push  
Install new tape  
REC (two) pb – push simo  
PAUSE pb – push

Perform following for each video segment:

CC  
|| pb – push (To PLAY)  
V10  
PAUSE pb – push (To REC)  
When EDIT segment complete:  
CC  
|| pb – push (PAUSE)  
V10  
PAUSE pb – push (PAUSE)  
When complete:  
STOP pb – push simo  
Cue to next starting point and repeat as reqd
CANON G1 (Continued)

G1 TO V10 VIA ORBITER TV SYSTEM

- Config H/W per dwg at right
- √Orbiter in async mode
- Perform ACTIVATION (Cue Card, TV)

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

O19(MO58F)
- √TV PWR – ON

CC
- PWR dial – VTR/PLAY
- √AV1/V2 – V2
- Install source tape, Protect Tab – slide (red visible)
- Cue tape to desired take via FF(REW) pb
- PLAY pb – push
- || 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
- || pb – push (To PLAY)

V10
- PAUSE pb – push (To REC)

When EDIT segment complete:

CC
- || pb – push (PAUSE)

V10
- PAUSE pb – push (PAUSE)
CANON G1 (Continued)

G1 TO DSR-25 VTR

Config H/W per dwg at right

L10 (MUX)

\- VTR/CC PWR – on (LED on)

(VTR)

\- ON/STANDBY LED – green

INPUT SELECT – DV

Install new tape

REC pb – push,hold

PLAY pb – push, simo (red dot displayed on LCD)

PAUSE pb – push

VTR/CC PWR – off (LED off) as reqd

L10 (MUX)

ON/STANDBY LED – green

INPUT SELECT – DV

Install new tape

REC pb – push,hold

PLAY pb – push, simo (red dot displayed on LCD)

PAUSE pb – push

VTR/CC PWR – off (LED off) as reqd

CC

PWR dial – VTR/PLAY

Disconnect DTV IEEE 1394 Cable

MENU pb – push

SELECT/SET:

Sel ‘SIGNAL SETUP’

HD DOWN-CONV – ON

MENU pb – push

Reconnect DTV IEEE 1394 Cable

Install source tap, Protect Tab – slide (red visible)

Cue tape to desired take via FF(REW) pb

PLAY pb – push

|| pb – push

Perform following for each video segment:

CC

|| pb – push (To PLAY)

L10 (VTR)

PAUSE pb – push (To REC)

When EDIT segment complete:

CC

|| pb – push (PAUSE)

L10 (VTR)

PAUSE pb – push (PAUSE)

When complete:

INPUT SELECT – VIDEO

Remove,mark tape

ON/STANDBY pb – 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
SINGLE CAMCORDER W/CAMCORDER MICROPHONE

Config H/W per dwg at right

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

O19(MO58F)
- TV PWR – ON

CC
- Wide Conversion Lens installed
- ND FILTER – OFF
- AF/M – AF
- AGC – OFF
- GAIN – L(M)
- OUTPUT – CAM
- A/V1/V2 – V2
- AWB – ON
- STANDBY/LOCK – STANDBY

PWR dial – A
- CP1(2-9) displayed
- Tape – Install
- Viewfinder (LCD) displays “green” •||
- Multiuse Brkt, Clamp

Lav Mic
- ON/OFF – ON

If Photoflood:
- AC UTIL PWR AC1 – ON
- ON/OFF – ON
- HI/LO – HI

If Worklights:
- ON/OFF – ON

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(503) / 528–20650–1(3))

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

FOR PAO EVENTS

Worklight

Worklight

Photoflood

ORBITER O19(MO58F)

AVIU

J2

J4

J6

J1

J5

J3

J7

J1

J5

J3

J7

Video

Pwr

RCA-BNC Adapter
SONY V10

SPECIFICATIONS

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

NOMENCLATURE

1. REC ORG TC Lamp
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)

NOMINAL MENU SETTINGS

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

SONY LCD SPECIFICATIONS

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

SONY LCD NOMENCLATURE

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

A31p VIDEO CONVERTER

A31p

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

<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 (15 ft) (SED39122269-301)</td>
<td>• L10A1 VTR OUT</td>
<td>• A31p Video Adapter</td>
<td>• BNC —— RCA</td>
</tr>
<tr>
<td>Monitor 1(2)</td>
<td>• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>• Mon/J3</td>
<td>• AVIU/J4</td>
<td>• Circ — Twinax</td>
</tr>
<tr>
<td>(option 1)</td>
<td>• AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU Video Cable Assy (SEZ33114239-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Monitor 1(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(option 2)</td>
<td>• Mon/J3</td>
<td>• AVIU/J4</td>
<td>• Circ — Twinax</td>
</tr>
<tr>
<td></td>
<td>• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>• Mon/J3</td>
<td>• AVIU/J4</td>
<td>• Circ — Twinax</td>
</tr>
<tr>
<td></td>
<td>• AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Balanced Video Cable (SED33105778-301)</td>
<td></td>
<td></td>
<td></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 (15 ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor 1(2)</td>
<td>• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>• Mon/J3</td>
<td>• AVIU/J4</td>
<td>• Circ — Twinax</td>
</tr>
<tr>
<td>(option 3)</td>
<td>• AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor 1(2)</td>
<td>• Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>• Mon/J3</td>
<td>• AVIU/J4</td>
<td>• Circ — Twinax</td>
</tr>
<tr>
<td>(option 4)</td>
<td>• AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A31p Video Converter (Continued)

<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 (SED39136025-301)</td>
<td>• VPU FROM ISS</td>
<td>• Balanced Video Cable</td>
<td>• Plug – Twinax</td>
</tr>
<tr>
<td></td>
<td>• Balanced Video Cable (SED33105778-301)</td>
<td>• VPU Patch Cable</td>
<td>• Bal/Unbal Xfmr</td>
<td>• Twinax – Twinax</td>
</tr>
<tr>
<td></td>
<td>• Bal/Unbal Xfmr (SED39124190-301)</td>
<td></td>
<td>• Bal/Unbal Xfmr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td></td>
<td>• A31p Video Adapter</td>
<td></td>
</tr>
<tr>
<td>Spare 1 (SSV)</td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</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>
<td></td>
<td>• Bal/Unbal Xfmr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td></td>
<td>• A31p Video Adapter</td>
<td></td>
</tr>
<tr>
<td>WVS</td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td>• R12A2 WIB XCVR1(2) UNBAL</td>
<td>• A31p Video Adapter</td>
<td>• BNC – RCA</td>
</tr>
<tr>
<td>PD100 Camc  (option 1)</td>
<td>• PD100 A/V Adapter Cable (SEZ16103275-301)</td>
<td>• PD100 A/V Port</td>
<td>• RCA-RCA Cable (via female adapter)</td>
<td>• Stereo – RCA</td>
</tr>
<tr>
<td></td>
<td>• RCA - RCA Cable (SED39122260-314)</td>
<td>• A/V Adapter</td>
<td>• A31p Video Adapter</td>
<td>• RCA – RCA</td>
</tr>
<tr>
<td>PD100 Camc  (option 2)</td>
<td>• Y-C Cable (SED33104816-301)</td>
<td>• PD100 S-Video Port</td>
<td>• A31p Video In Port (No A31p Video Adapter)</td>
<td>• S-Video – S-Video</td>
</tr>
</tbody>
</table>

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

PGSC VIDEO OVERLAY

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>
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<tr>
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<th>To</th>
<th>Cable Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAYLOAD/DTV</td>
<td>AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td>L10A1 VTR OUT</td>
<td>VID IN/OUT Cable</td>
<td>BNC – RCA</td>
</tr>
<tr>
<td>Monitor 1(2)</td>
<td>Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>Mon/J3</td>
<td>AVIU/J4</td>
<td>Circ – Twinax</td>
</tr>
<tr>
<td>(option 1)</td>
<td>AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>AVIU Video Cable Assy (SEZ33114239-301)</td>
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<tr>
<td>Monitor 1(2)</td>
<td>Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>Mon/J3</td>
<td>AVIU/J4</td>
<td>Circ – Twinax</td>
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<tr>
<td>(option 2)</td>
<td>AVIU (SED33111493-302/303)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Balanced Video Cable (SED33105778-301)</td>
<td></td>
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<td></td>
<td>Bal/Unbal Xfmr (SED39124190-301)</td>
<td></td>
<td></td>
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<tr>
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<td>AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
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<tr>
<td>Monitor 1(2)</td>
<td>Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>Mon/J3</td>
<td>AVIU/J4</td>
<td>Circ – Twinax</td>
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<td>(option 3)</td>
<td>AVIU (SED33111493-302/303)</td>
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<td>AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
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<td>Monitor 1(2)</td>
<td>Monitor to AVIU/CM Cable (20 ft) (SED39122074-303)</td>
<td>Mon/J3</td>
<td>AVIU/J4</td>
<td>Circ – Twinax</td>
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<tr>
<td>(option 4)</td>
<td>AVIU (SED33111493-302/303)</td>
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<td></td>
<td>Bal/Unbal Xfmr (SED39124190-301)</td>
<td></td>
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<tr>
<td></td>
<td>AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
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#### 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>
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<tbody>
<tr>
<td>ISS</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>• Balanced Video Cable (SED3105778-301)</td>
<td></td>
<td>• Bal/Unbal Xfmr</td>
<td>• Twinax – 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 (15 ft) (SED39122269-301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spare 1 (SSV)</td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td>• L11A2 PDIP/J107</td>
<td>• Bal/Unbal Xfmr</td>
<td>• Circ – Twinax</td>
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<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 (15 ft) (SED39122269-301)</td>
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<td></td>
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<tr>
<td>WVS</td>
<td>• AVIU-CC Video Cable (15 ft) (SED39122269-301)</td>
<td>• R12A2 WIB XCVR1(2)</td>
<td>• VID IN/OUT Cable</td>
<td>• BNC – RCA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PD100 Camc</td>
<td>• PD100 A/V Adapter Cable (SEZ16103275-301)</td>
<td>• PD100 A/V Port</td>
<td>• RCA-RCA Cable (via</td>
<td>• Stereo – RCA</td>
</tr>
<tr>
<td>(option 1)</td>
<td>• RCA - RCA Cable (SED39122260-314)</td>
<td>• A/V Adapter</td>
<td>female adapter)</td>
<td></td>
</tr>
<tr>
<td>PD100 Camc</td>
<td>• Y-C Cable (SED33104816-301)</td>
<td>• PD100 S-Video Port</td>
<td>• VID IN/OUT Cable</td>
<td>• RCA – RCA</td>
</tr>
<tr>
<td>(option 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Config video source
5. Double-click Shuttle Apps > Video Overlay
6. √ Video overlay displayed
   * If image not displayed on PGSC:
     * Press ‘S’
     * √'VIDEO’ selected
     * Sel OK
PORTABLE MONITORS (Concluded)

VPU REPEATER
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CCTV

SPECIFICATIONS

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

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

LENS DATA

<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></td>
<td></td>
<td></td>
<td></td>
<td>Horizontal</td>
</tr>
<tr>
<td>CTVC (COLOR)*</td>
<td>5.5mm-47mm</td>
<td>f/1.7 to f/16 (T2-T360)</td>
<td>8:1</td>
<td>1.0</td>
</tr>
<tr>
<td>ITVC (B/W)*</td>
<td>8.5mm-127mm</td>
<td>f/1.7 to f/16 (T2-T360)</td>
<td>15:1</td>
<td>3.0</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 (Continued)

AVIU OVERVIEW

J1
- Unbalanced Video Input/Output

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

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

J4
- Balanced Video Input

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

J6
- Balanced Video Signal Output (turnaround from J4)

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

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

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

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

PHOTO FLOODLIGHT

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

10.2
1
10.3
1
10.4
1

1

MON 1(2) LVPS STATUS

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

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

26

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

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

Menu visible?

Yes

4

Does cursor move?

No

22

3

Try to bring up Menu

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

Menu visible?

Yes

No

Test pattern on MON 2(1)?

No

11

(VCU OK

22

Yes

Which menu SOURCE is currently in use:
C(D,SPLIT,RGB)
PNL
DNLK

7

Try MON 2(1)
DNLK SOURCE

(A3)
MON 2(1) menu
• SOURCE – DNLK

5

Send test pattern to MON 2(1)

(A3)
MON 2(1) menu
• SOURCE – PNL

22

9

(C(D,SPLIT,RGB)
PNL
DNLK

(A3)
MON 2(1) menu
• SOURCE – DNLK

Picture on MON 2(1)?

No

10

Yes

39

50

LVPS = low voltage pwr supply

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

3 INPUT used here was recorded in block 2

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

5 All TV config in VCU will be lost. All camrs must be 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 50
   No 5

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 11
   No 12

11 Switch SYNC generators
   (A7U)
   • TV SYNC – REVERSE
   • VID OUT MON 1(2) pb – push
   • VID IN TEST pb – push
   Test pattern on MON 1(2)?
   Yes 13
   No

12 Try other VCU pwr source
   (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 14
   No 15

13 SYNC GEN FAILURE

14 VIDEO INPUT DEVICE OR VSU INPUT FAILURE

15 SYNCH REV

16 Continue on SYNCH 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

19 VCU FAILURE; LOSS OF ALL TV

20 Continue nominal ops on MNB(MNA)

21 • MCC
8 SOURCE is the source recorded in block 2.

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

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 – ←
• →

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) MCC

28 Reselect original source.

(A3) MON 1(2) menu
• 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)
39 Try another input for DNLK
(A7U)
- VID OUT DNLK pb – push
- VID IN TEST pb – push

40 Try original input to MON 1(2)
PNL SOURCE
(A7U)
- VID OUT MON 1(2) pb – push
- VID IN INPUT pb – push

41 VIDEO INPUT DEVICE OR VSU
INPUT FAILURE

42 INPUT Y TO DNLK
CROSSPOINT FAILED IN VSU
(A3)
MON 1(2) menu
- SOURCE – PNL

43 Select PNL SOURCE for MON 1(2)
(A3)
MON 1(2) menu
- SOURCE – PNL

44 Which Video device used for input:
- STANDARD ORBITER CCTV CAMR (NOT CAMCORDER)
- CAMCORDER
- ORBITER VTR

45 Continue nominal ops with other inputs for dnlk

46 MON 1(2)
SIGNAL PROCESSING CIRCUIT FAILURE, MON 1(2) LOST

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

48 Use MON 2(1)

55 Yes

7 3

No

No

Yes

Test pattern on MON 1(2)?

Test pattern on MON 1(2)?

MON 1(2) menu
- SOURCE – PNL

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

4 INPUT used here was recorded in block 2

10.1 (Cont)
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.
55

71 Select SOURCE PNL for 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)?

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

73 Left(right) half picture lost
Entire picture lost

75 Select SOURCE PNL for 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)?

74 MON 1(2) INPUT C(D) OR VIDEO SOURCE DEVICE FOR INPUT C(D) FAILED

76 Continue MON 1(2) ops on other sources

(A3) MON 1(2) menu
- MODE – AUTO

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

78 Use MON 2(1)

79 MON 1(2) SPLIT SCREEN CAPABILITY LOST

80 Continue MON 1(2) ops on other sources

(A3) MON 1(2) menu
- MODE – AUTO

11 Recovery of video source device may be possible

12 Inputs C,D may be useable without SPLIT
CCTV

10.2 NO CAMR VIDEO

No Camr Video

Nominal Config:

(R14:D)
- cb MNA TV C AFT
- BAY CAMR/PAN-TILT – cl
- CAMR HTR – cl
- PAN-TILT HTR – cl
- cb MNA TV CONTR UNIT – cl
- cb MNA TV MON 1 – cl
- cb MNB TV A FWD
- BAY CAMR/PAN-TILT – cl
- CAMR HTR – cl
- PAN-TILT HTR – cl
- cb MNB TV CONTR UNIT – cl
- cb MNB TV MON 2 – cl
- cb MNC TV B KEEL/EVA CAMR/PAN-TILT – cl
- CAMR HTR – cl
- PAN-TILT HTR – cl
- cb MNC TV CAB – cl
- (R14:E)
- cb MNA D STBD
- RMS TV CAMR/PAN-TILT – cl
- CMR HTR – cl
- PAN-TILT HTR – cl
- cb MNB RMS PORT
- RMS TV CAMR/PAN-TILT – cl
- CAMR HTR – cl
- PAN-TILT HTR – cl
- (A7U)
- TV PWR CNTL – CMD
- TV PWR CONTR UNIT – MNA(MNB)
- TV SYNC – NORM
- TV 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)?

Yes

No

2. Location of affected Camr:

- CABIN – Camcorder
- CABIN – Standard orbiter CCTV Camr (not Camcorder)

10.4

1

3. Cycle MIDDECK(FLT DECK) Camr pwr

(M058F(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 – push
- CAMR CMD AVG pb – push

Picture on MON 1(2)?

Yes

No

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 – push
- CAMR CMD AVG pb – push

Picture on MON 1(2)?

Yes

No

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 – push
- CAMR CMD AVG pb – push

Picture on MON 1(2)?

Yes

No

6. CAMR LOST

No

Yes

7. ALC LOGIC LOCKUP IN AFFECTED CAMR

8. Continue nominal ops

1. KEEL Camr pwr control and KEEL Camr Video inputs are mission specific
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
   (MO58F(O19))
   • TV PWR – OFF
   • Replace Camr cable
   • TV PWR – ON
(On Camr)
• ALC - AVG

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

Picture on MON 1(2)?

11 RMS WRIST(ELBOW) CAMR FAILURE

12 CAMR CABLE FAILURE

13 RMS REMOTE VIDEO SWITCHER FAILURE OR VSU RMS INPUT FAILURE

14 RMS ELBOW(WRIST) Camr functional

15 Try alternate TV pnl
   (MO58F(O19)) (original pnl)
   • TV PWR – OFF
   • Disconnect TV Cable at pnl
   (O19(MO58F)) (new pnl)
   • TV PWR – ON
   • Connect cable
   (On Camr)
   • ALC - AVG

16 Both RMS Camrs unusable

17 Try alternate Camr
   (O19(MO58F))
   • TV PWR – OFF
   • Connect alternate Camr
   • TV PWR – ON
(On Camr)
• ALC - AVG

Picture on MON 1(2)?

18 ORIGINAL TV PANEL FAILURE

19 TV CAMR FAILURE

20 INDEPENDENT DOUBLE FAILURE

Yes

3

No

2

Yes

5

No
10.3 NO VTR PLAYBACK VIDEO

No VTR Playback Video

Nominal Config:
(R14:D)
- CB MNA TV CONTR UNIT – cl
- CB MNA TV MON 1 – cl
- CB MNB TV CONTR UNIT – cl
- CB MNB TV MON 2 – cl
- CB MNC TV CAB – cl

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

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

(V10)
- PWR – 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)?

   Yes
   No
   10.1

2. Try another tape in V10
   (V10)
   ● Tape – EJECT
   ● Change tapes
   ● PLAY pb – press

3. Select V10 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. FIRST TAPE CONTAINED NO VIDEO

5. Try alternate TV Pwr Cable
   (V10)
   ● STOP pb – press
   (O19(MO58F))
   ● TV PWR – OFF
   ● Replace TV Pwr Cable
   ● TV PWR – ON
   (V10)
   ● PLAY pb – push

   Picture on MON 1(2)?

   Yes
   No
   9

6. ORIGINAL TV PWR CABLE FAILURE

7. Continue ops on alternate TV Pwr Cable

8. √MCC

9

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
CCTV 10.3 (Cont)

9. Try alternate PIGMY Cable
   - STOP pb – push
   - TV PWR – OFF
   - Replace PIGMY Cable
   - TV PWR – ON

10. ORIGINAL PIGMY CABLE VID/SYNC/PWR LEG FAILURE
    - STOP pb – push
    - TV PWR – OFF
    - Replace PIGMY Cable
    - TV PWR – ON
    - PLAY pb – push
    - Picture on MON 1(2)?
      - Yes
      - 11. Continue ops on alternate PIGMY Cable
      - No
      - 14. V10 FAILURE

11. V10 FAILURE
    - MCC

12. Try alternate TV pnl
    - TV PWR – OFF
    - Disconnect TV Cable (PIGMY Cable) at pnl
    - TV PWR – ON
    - Connect cable
    - TV PWR – ON
    - VID OUT MON 1(2) pb – push
    - VID IN MIDDECK (FLT DECK) pb – push
    - Picture on MON 1(2)?
      - Yes
      - 15. ORIGINAL TV PNL FAILURE
      - No
      - 16. Continue ops using alternate TV pnl

13. MCC

3. MCC if alternate equip avail

4. IFM for AVIU (cables) may be possible
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 1

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 4

4. TRANSIENT CAMCORDER FAILURE
   • Continue normal ops

5. Picture in Camcorder Viewfinder/LCD?
   Yes 6

6. 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

Change out Camcorder Battery Pack

- (PD100) MODE – OFF
- Replace Battery Pack
- MODE – CAMERA

Picture on MON 1(2)?

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
- Replace Battery Pack
- MODE – CAMERA

Picture on MON 1(2)?

11 Try powering Camcorder w/Battery Pack

- (MO58F(O19)) TV PWR – OFF
- MODE – OFF
- Remove Digital CC Vid/Pwr Cable
- Install Battery Pack
- MODE – CAMERA

Camcorder viewfinder/LCD?

12 ORIGINAL BATTERY PACK DEAD

- (PD100) TV PWR – OFF
- Remove Battery Pack
- Install Digital CC Vid/Pwr Cable

Camcorder FAILURE. CAMCORDER NOT USEABLE

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

- (MO58F(O19)) TV PWR – ON
- MODE – CAMERA

Picture on MON 1(2)?

18 Try to pwr other devices from MO58F(O19)

19 Continue ops on orbiter pwr or try remaining Batteries

10-21 P/TV/ALL/GEN I
CCTV 10.4 (Cont)

25

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)?

Yes

36 ORIGINAL AVIU FAILURE

No

2

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

40 CAMCORDER VIDEO PORT FAILURE

No

3

38 Continue ops on alternate AVIU

39

- √MCC

43

- √MCC

42

- Use alternate Camcorder if video output reqd
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.

1. Wrist Camr
   - TV CAMR PWR RMS – OFF
   - VID OUT MON 1(2) pb – push
   - VID IN RMS pb – push

2. Select Wrist Camr
   - PORT RMS CAMR – WRIST

3. Turn on Camr pwr
   - TV CAMR PWR RMS – ON
   - CAMR CMD ALC pb – push
   - CAMR CMD PEAK pb – push

Yes No

4. WRIST CAMR LOST

5. Wrist Camr operational. Wait for MCC OK to perform next step

6. Elbow Camr
   - TV CAMR PWR RMS – OFF

7. Select Elbow Camr
   - PORT RMS CAMR – ELBOW

8. ELBOW CAMR LOST

9. Yes

10. 5 RMS TV cb OPENS

Nominal Config:

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

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

(A7U)
- TV CAMR PWR RMS – OFF
- VID OUT MON 1(2) pb – push
- VID IN RMS pb – push

(A7U)
- PORT RMS CAMR – WRIST

(R14:E)
- On MCC GO:
  - cb MNB RMS PORT RMS TV CAMR/PAN-TILT – cl
  - Wait 10 sec
  - cb open?

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

(A3)
- TV CAMR PWR RMS – OFF

(A7U)
- PORT RMS CAMR – ELBOW

(R14:E) (If necessary)
- On MCC GO:
  - cb MNB RMS PORT RMS TV CAMR/PAN-TILT – cl
  - Wait 10 sec
  - cb open?

Yes No

11. 5 RMS TV cb OPENS

Port RMS TV Camr/Pan-Tilt cb Opens
9
(A7U)
- TV CAMR PWR RMS – ON
- CAMR CMD ALC pb – PEAK

Video on Monitor and cb closed?
Yes → 10 Elbow Camr operational
No → 8

11 Wrist Camr work in block 3?
Yes → 12 Select Wrist Camr
No → 13 WIRING FAILURE OR CAMR PWR RELAY FROZEN. BOTH RMS CAMRS LOST

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 – push
- CAMR CMD PEAK pb – push

Video on Monitor and cb closed?
Yes → 14 WRIST CAMR OPERATIONAL. ELBOW CAMR FAILED
No → 13 WIRING FAILURE OR CAMR PWR RELAY FROZEN. BOTH RMS CAMRS LOST

15
- Do not use Elbow Camr
# CENTERLINE (C/L) CAMR

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CENTERLINE (C/L) CAMR

C/L CAMR INSTALL

1. ODS C/L Camr Config
   L12 (SSP 2) \(\sqrt{\text{C/L CAM PWR – OFF}}\)

R12 (VPU) \(\sqrt{\text{SEC C/L Cap installed}}\)
\(\sqrt{\text{Green Jumper – SEC C/L}}\)
\(\sqrt{\text{VPU PWR – ON (LED on)}}\)

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

NOTE
   When connecting ODS C/L TV
   Camr Harness Assy, \(\sqrt{\text{pins to}}\)
   \(\sqrt{\text{socket connection}}\)

ODS \(\sqrt{\text{ODS C/L Camr Brkt mounted securely}}\)
   Mount PRI C/L Camr to ODS C/L Camr Brkt
\(\sqrt{\text{Flex Duct attached to Camr brkt}}\)
   Config cable per dwg at right

C/L Camr \(\sqrt{\text{SSF/STS sw – STS}}\)

L12 (SSP 1) \(\sqrt{\text{cb SW PWR 1 (CB2) – cl}}\)
(SSP 2) \(\sqrt{\text{C/L CAM PWR – SEC ON}}\)
2. Camr Position Verification

**NOTE**
This view in ODS looking up from Camr bottom

PRI C/L TV Camr Harness Assy (8.5 ft)
V828–774057–004

[js48037_04fr2.cxx](file)
C/L CAMR INSTALL (Concluded)

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

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

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

   **A7**
   - Zoom to $10^\circ \pm 0.5^\circ$
   - Focus to see Xhair target

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

   **MON 1(2)**
   - Vertical xhairs coincide w/vertical alignment wire and are parallel. If xhair marks overlay each other, no yaw(axial) alignment needed (see dwg above)

   - Intersection of monitor vertical, horizontal xhair falls within target circular opening from ~10-40° zoom range of Camr

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

4. **Deactivation**

   **A7**
   - CAMR CMD IRIS – CL
   - L12 (SSP 2)
   - C/L CAM PWR – OFF

   Go to DEACTIVATION (Cue Card, TV) as reqd
C/L CAMR VIDEO TROUBLESHOOT

1. √C/L Camr nominal config:
   | ODS | Camr SSF/STS sw – STS  |
   | R12 (VPU) | VPU SEC C/L Cap installed on SEC C/L |
   |       | Green Jumper – SEC C/L |
   |       | VPU PWR – ON (lt ON) |
   | L12 (SSP 1) | cb SW PWR 1 (CB2) – cl |
   | (SSP 2) | C/L CAM PWR – SEC ON |
   | A7 | VID OUT MON 1(2) pb – push |
   | A3 (MON) | C/L Camr Video |

If no C/L Camr video on monitor:

2. Pwr-Cycle C/L Camr:
   | A7 | CAMR CMD IRIS – CL (hold 8 sec) |
   | L12 (SSP 2) | C/L CAM PWR – OFF, wait 10 sec, SEC ON |
   | A7 | ALC pb – push |
   | A3 (MON) | C/L Camr Video |
CENTERLINE (C/L) CAMR (Continued)

C/L CAMR VIDEO TROUBLESHOOT (Continued)

If still no C/L Camr video on monitor:

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

If still no C/L Camr video on monitor:

4. Change C/L TV Camr Harness Assy:
   A7   CAMR CMD IRIS – CL (hold 8 sec)
   L12 (SSP 2)   C/L CAM PWR – OFF
   Unstow SEC C/L TV Camr Harness Assy per stowage plan
   Disconnect PRI C/L TV Camr Harness Assy from ODS TV1 port and PRI C/L Camr
   Connect SEC C/L TV Camr Harness Assy to ODS TV1 and PRI C/L Camr
   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 SEC C/L Camr:

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

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

- L12 (SSP 2)   C/L CAM PWR – PRI ON

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

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

If still no C/L Camr video on monitor:

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

C/L CAMR MISALIGNMENT

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

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

Perform each of the remaining steps if misalignment persists:

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

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

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

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

C/L CAMR 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  √MON 2 PWR – OFF
   R14:D  cb MNB TV MON 2 – op
   A3  Disconnect Pwr MNB from MON 2 J1

   Config per dwg, 11-11

2. **Activation**

   TVCU CENTERLINE/CAMCORDER sw – CENTERLINE
   O19 TV Pwr – ON
   L12 C/L CAM PWR – SEC ON
   (SSP 2)

   PGSC PWR SOURCE – ON
   A31p PGSC – ON

   R14:D cb MNB TV MON 2 – cl
   A3 MON 2 PWR – ON
   V10 PWR – ON (LED on)
   Tape – Installed

   LCD PWR – ON

   A31p Insert TVCU Boot CD
   Shutdown Windows
   Pwr on A31p while holding down F12 key until
   ‘Boot Menu’ appears
   Sel ‘3. CD-ROM Drive’ using down arrow
   (selected when text white)
   <Enter>
   CTVC CONTROLLER menu
   CAMERA (click)
   P2 (click)
   ALC – AVG (click)
   Return to P/TV scene as reqd
   CTVC CONTROLLER menu
   √Zoom,Iris,Focus as reqd
3. **Deactivation**

   A31p
   - 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

## Specifications

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DTV

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 (CH 1/2)
4. TIMER sw (OFF)
5. ON/STANDBY pb, LED (red/green)
6. KEY INH sw (OFF)
7. Cassette Compartment
8. Display Window and Controls
9. EJECT pb
10. AUDIO INPUT sw (FIX)
11. CH-1 AUDIO REC LEVEL Control kb (N/A)
12. CH-2 AUDIO REC LEVEL Control kb (N/A)
13. DUP pb (not used)
14. AUDIO DUB pb (N/A)
15. Tape Transport Controls
16. INPUT SELECT sw (VIDEO)
17. CHARACTER DISPLAY sw (OFF)
18. Monitor Display and Controls
### VTR (SONY DSR-25) – FRONT PANEL (Concluded)

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</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 (Default = CH 1/2)</td>
<td>Determines which audio channels are output in 32 kHz mode only</td>
</tr>
<tr>
<td>4</td>
<td>TIMER sw (Default = 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 (Default = 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 12-6 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 (Default = 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</td>
</tr>
<tr>
<td>12</td>
<td>CH-2 AUDIO REC LEVEL kb (N/A)</td>
<td>Controls audio level for VI data</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 12-7 for details</td>
</tr>
<tr>
<td>16</td>
<td>INPUT SELECT sw (Default = VIDEO)</td>
<td>Determines which video input jack the VTR will process</td>
</tr>
<tr>
<td>17</td>
<td>CHARACTER DISPLAY sw (Default = OFF)</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 12-8 for details</td>
</tr>
</tbody>
</table>
**NOMENCLATURE (Continued)**

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Control</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PAL Indicator/Amber</td>
<td>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</td>
<td>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</td>
<td>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</td>
<td>Lit solid when a tape is loaded into the VTR. Flashes during tape ejection</td>
</tr>
<tr>
<td>5</td>
<td>INDEX pb</td>
<td>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</td>
<td>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</td>
<td>Resets COUNTER displayed numbers to all zeroes</td>
</tr>
<tr>
<td>8</td>
<td>COUNTER SELECT sw</td>
<td>Determines which time data will be displayed in the counter display</td>
</tr>
<tr>
<td></td>
<td>COUNTER</td>
<td>Count value of the counter (DD:HH:MM:SS)</td>
</tr>
<tr>
<td></td>
<td>TC</td>
<td>Time code</td>
</tr>
<tr>
<td></td>
<td>U-BIT</td>
<td>User bits (not used)</td>
</tr>
<tr>
<td>9</td>
<td>Time Counter Display</td>
<td>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</td>
<td>Self explanatory</td>
</tr>
</tbody>
</table>
**VTR (SONY DSR-25) – TAPE TRANSPORT CONTROLS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>STOP pb</td>
</tr>
<tr>
<td>2</td>
<td>REW pb/Indicator/Amber</td>
</tr>
<tr>
<td>3</td>
<td>PLAY pb/Indicator/Green</td>
</tr>
<tr>
<td>4</td>
<td>FF pb/Indicator/Amber</td>
</tr>
<tr>
<td>5</td>
<td>PAUSE pb/Indicator/Amber</td>
</tr>
<tr>
<td>6</td>
<td>REC pb/Indicator/Red</td>
</tr>
</tbody>
</table>
VTR (SONY DSR-25) – MONITOR DISPLAY AND CONTROLS

LCD Monitor Displays playback(live) video and superimposed text, audio levels, and menu data

1. CHARACTER DISPLAY (LCD) sw (Default = ON) Controls the display of superimposed text on the monitor. BLACK BACK will block video flow to the monitor to provide a black background to improve superimposed data viewing

2. DISPLAY SELECT sw Determine what superimposed data is displayed on the monitor

   MENU Menu data
   DATA VTR information
   AUDIO Audio levels

3. EXEC pb Executes and selects menu items

4. ↑↓ pbs Allows navigation through and setting of menu items when in MENU mode, and adjusts monitor brightness when in DATA mode
DTV (Continued)

NOMENCLATURE (Continued)

VTR (SONY DSR-25) – REAR PANEL

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

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

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT Jacks</strong></td>
<td>Video and audio inputs</td>
</tr>
<tr>
<td>1</td>
<td>S_VIDEO</td>
</tr>
<tr>
<td>2</td>
<td>VIDEO</td>
</tr>
<tr>
<td>3</td>
<td>AUDIO CH-1/3</td>
</tr>
<tr>
<td>4</td>
<td>AUDIO CH-2/4</td>
</tr>
<tr>
<td><strong>OUTPUT Jacks</strong></td>
<td>Video and audio outputs</td>
</tr>
<tr>
<td>5</td>
<td>S_VIDEO</td>
</tr>
<tr>
<td>6</td>
<td>VIDEO</td>
</tr>
<tr>
<td>7</td>
<td>AUDIO CH-1/3</td>
</tr>
<tr>
<td>8</td>
<td>AUDIO CH-2/4</td>
</tr>
<tr>
<td><strong>MONITOR Jack</strong></td>
<td>VTR MON Video (Note: Will not display VTR Playback Video)</td>
</tr>
<tr>
<td><strong>DV Jack</strong></td>
<td>IEEE 1394 4-pin video/audio connection</td>
</tr>
<tr>
<td><strong>Cooling Fans</strong></td>
<td>Reversed to bring air into unit</td>
</tr>
<tr>
<td><strong>DC IN Connector</strong></td>
<td>DC pwr source connection</td>
</tr>
<tr>
<td><strong>AUDIO INPUT LEVEL sw</strong></td>
<td>Sets the audio fixed gain level when the AUDIO INPUT is set to FIX. Default is -10. 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 (SONY DSR-25) NOMINAL MENU SETTINGS

<table>
<thead>
<tr>
<th>MENU</th>
<th>SUB MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC (TC/UB SET)</td>
<td>TC PRESET – N/A</td>
</tr>
<tr>
<td></td>
<td>UB PRESET – N/A</td>
</tr>
<tr>
<td></td>
<td>DV IN TC – INTERNAL</td>
</tr>
<tr>
<td></td>
<td>TC MAKE – REGEN</td>
</tr>
<tr>
<td></td>
<td>TC RUN – REC RUN</td>
</tr>
<tr>
<td></td>
<td>TC FORMAT – AUTO</td>
</tr>
<tr>
<td>CM (CM SET)</td>
<td>CM SEARCH – ON</td>
</tr>
<tr>
<td></td>
<td>TITLE DISP – ON</td>
</tr>
<tr>
<td></td>
<td>LABEL DISP – ON</td>
</tr>
<tr>
<td></td>
<td>TAPE LABEL – N/A</td>
</tr>
<tr>
<td></td>
<td>ITEM ERASE – N/A</td>
</tr>
<tr>
<td></td>
<td>ERASE ALL – N/A</td>
</tr>
<tr>
<td>DISP (DISPLAY SET)</td>
<td>DATA CODE – DATE (non-default)</td>
</tr>
<tr>
<td></td>
<td>EE/PB SEL – EE</td>
</tr>
<tr>
<td></td>
<td>LTR SIZE – NORMAL</td>
</tr>
<tr>
<td></td>
<td>COLOR BAR – OFF</td>
</tr>
<tr>
<td></td>
<td>DATE DISP – M/D/Y</td>
</tr>
<tr>
<td></td>
<td>TIME DISP – 24H</td>
</tr>
<tr>
<td>V (VIDEO SET)</td>
<td>PB YNR – OFF</td>
</tr>
<tr>
<td></td>
<td>PB CNR – OFF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MENU</th>
<th>SUB MENU</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (AUDIO SET)</td>
<td>AUDIO MODE – FS48k (non-default)</td>
</tr>
<tr>
<td></td>
<td>JOG AUDIO – OFF</td>
</tr>
<tr>
<td>VTR (VTR SET)</td>
<td>REC MODE – DVCAM</td>
</tr>
<tr>
<td></td>
<td>AUTO INDEX – ON</td>
</tr>
<tr>
<td></td>
<td>STILL PICT – AUTO</td>
</tr>
<tr>
<td></td>
<td>FF/REW SPD – FF/REW</td>
</tr>
<tr>
<td></td>
<td>DUPLICATE – N/A</td>
</tr>
<tr>
<td></td>
<td>DV EE OUT – ON (non-default)</td>
</tr>
<tr>
<td></td>
<td>STILL TIME – 1 MIN (non-default)</td>
</tr>
<tr>
<td></td>
<td>FROM STILL – STOP</td>
</tr>
<tr>
<td>ETC (OTHERS)</td>
<td>COMMANDER – WIRELESS</td>
</tr>
<tr>
<td></td>
<td>AC ON MODE – POWER ON (non-default)</td>
</tr>
<tr>
<td></td>
<td>AUTO STBY – DISABLE</td>
</tr>
<tr>
<td></td>
<td>BEEP – ON</td>
</tr>
<tr>
<td></td>
<td>LCD BRIGHT – mid</td>
</tr>
<tr>
<td></td>
<td>LCD COLOR – mid</td>
</tr>
<tr>
<td></td>
<td>CLOCK SET – GMT</td>
</tr>
<tr>
<td></td>
<td>HRS METER – N/A</td>
</tr>
</tbody>
</table>
DTV FUNCTIONAL SCHEMATIC

- VSU
- MA73C
- KU–Band Signal Processor
- DA
- MCC
- MUX
- PSDP
- PNL L10A2
- VIP
- VTR SONY DSR25
- CCU
- LCD TV
- CTVM
- TDRS

12-14 P/TV/ALL/GEN I,1
DTV (Continued)

VTR CLOCK SET

1. Activate VTR

R1
√PL AUX – ON

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

2. Set VTR clock to GMT

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

DISPLAY SELECT – DATA

3. Deactivate VTR as reqd

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

MALS

12.1 NO VIDEO AT VTR OUT

A7
Video Signal routed to VID OUT DTV pb
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
DISPLAY SELECT – DATA
(MUX)
\ CHANNEL 3 DATA LED – on; if not, go to MAL 12.4
If no joy, \ MCC for possible IEEE 1394 male cable replacement
DTV (Continued)

MALS (Continued)

12.3 MUX PWR LED(s) OFF

R1
√PL AUX – ON

L10 (MUX)
√VTR/CC(MUX/VTR/CC) PWR – on (LEDs on)
Notify MCC before proceeding
√5 Amp Fuse (spare in DTV Fuse Kit)

If no joy, √MCC

12.4 MUX CHANNEL 3 DATA LED OFF

√DTV MAL 12.2 complete

L10 (MUX) If CHANNEL 3 1394,BUFF LEDs – on, signal not reaching MUX for processing
(VTR)  ON/STANDBY pb – push (red LED on)
If PD100:
PD100 PWR – OFF

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

If no joy:
Repeat pwrdn per previous steps
Disconnect,reconnect IEEE 1394 cable
Repeat pwruup per previous steps
If no joy, √MCC

If only CHANNEL 3 1394 LED – on, MUX 1394 format error
If only CHANNEL 3 BUFF LED – on, MUX FIFO memory buffer error
√MCC
DTV (Continued)

MALS (Continued)

12.5 VIP PWR LED OFF

MA73C  \(\sqrt{\text{cb AC2 PL } 3\Phi – cl}\)

L10 (VIP)  \(\sqrt{\text{PWR – on}}\)
   Notify MCC before proceeding
   Pull VIP from container to check fuses
   \(\sqrt{\text{F1 5 Amp Fuse (spare in DTV Fuse Kit)}}\)
   \(\sqrt{\text{F2 2 Amp Fuse (spare in DTV Fuse Kit)}}\)
   If no joy, \(\sqrt{\text{MCC}}\)

12.6 VIP DATA FLOW LED OFF

MA73C  \(\sqrt{\text{cb AC2 PL } 3\Phi – cl}\)

L10 (VIP)  \(\sqrt{\text{PWR – on}}\)

A7  \(\sqrt{\text{Video signal routed to VID OUT DTV pb}}\)
   \(\sqrt{\text{Video signal has Vertical Interval data (PLB Camrs)}}\)

L10 (VTR)  DISPLAY SELECT – AUDIO
   \(\sqrt{\text{CHANNEL 2 AUDIO LEVEL METER indicates signal}}\)
   If signal indicated, LED failed
   Notify MCC, continue Nom Ops

      DISPLAY SELECT – DATA

(VIP)  PWR – off, then on (\(\sqrt{\text{DATA FLOW LED flashes twice}}\))
   If LED does not flash twice, \(\sqrt{\text{MCC}}\)
DTV (Continued)

MALS (Continued)

12.7  VTR ON/STANDBY RED LED OFF

R1  √PL AUX – ON

L10 (MUX)  √VTR/CC(MUX/VTR/CC) PWR – on (LEDs on)
Reset internal fuse by:
VTR/CC(MUX/VTR/CC) PWR – off, wait 30 sec, on

If no joy, √MCC

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

Timer sw out of config

L10 (VTR)  √TIMER – OFF

If no joy, √MCC

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

Key Inhibit sw appears to be on

L10 (VTR)  √KEY INH – OFF

If no joy, √MCC

12.10  VTR DISPLAYS ERROR MSG 32

VTR has entered SAFE MODE

L10 (VTR)  ON/STANDBY pb – push (red LED on)
(MUX)  VTR/CC,MUX/VTR/CC PWR – off (LEDs off), wait 10 sec, on (LED on)
(VTR)  √ON/STANDBY LED – green
√Error msg no longer displayed

If no joy, √MCC
DTV (Concluded)

MALS (Concluded)

12.11  VTR DISPLAYS ERROR MSG 21

VTR has detected moisture inside

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

12.12  VTR AUTOMATICALLY PWRS OFF

VTR Auto Off feature on

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

If no joy, √MCC
BPSMU SPECIFICATIONS

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

BPSMU AUDIO/VIDEO

1. **Set up BPSMU, Safe ODS TV Port**
   - BPSMU Connect Batt
   - L12 (SSP 2) 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
   - PWR – CAMERA Tape – Install
   - √ Viewfinder (LCD) displays STBY
   - Camr Settings
     - √ AUTO LOCK – AUTO LOCK
     - √ FOCUS – AUTO

3. **Config TVCU**
   - TVCU CENTERLINE/CAMCORDER sw – CAMCORDER
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** 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
DRAG THROUGH QD MATING

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

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

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

DRAG THROUGH QD MATING (Continued)

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


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

DRAG THROUGH QD MATING (Concluded)

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

DRAG THROUGH QD DEACTIVATION

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

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></td>
<td></td>
<td>Length</td>
</tr>
<tr>
<td>Glareshield</td>
<td>9.5 in - 10.5 in</td>
<td>2 in</td>
</tr>
<tr>
<td>Rear Window</td>
<td>12 in - 20 in</td>
<td>2 in</td>
</tr>
<tr>
<td>HUD</td>
<td>4.5-in base 1.5-in extension 2-in rise</td>
<td>N/A</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)

SPECIFICATIONS

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

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

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

UHF PLB COMMAND ANTENNA: 1 unit
- LOCATION: ODS TRUSS – AFT
WIRELESS VIDEO SYSTEM (WVS) (Continued)

SPECIFICATIONS (Concluded)

S-BAND RECEIVE ANTENNAS: Up to 7
   LOCATIONS: 2 at BAY 1 PORT, STBD SILL
   2 at BAY 4 PORT, STBD SILL
   2 at BAY 11 PORT, STBD SILL
   1 at AFT BULKHEAD
   POWER: 28 VDC from A7/WIRELESS VIDEO HEATER sw, Control Bus BC1

COMMAND LINK: UHF
   FREQUENCY: 400 MHz
   EFFECTIVE BANDWIDTH: 12kHz
   BIT RATE: 9600 bps

TELEMETRY/VIDEO LINK: S-BAND
   FREQUENCY: 2410 & 2470 MHz
   VIDEO BANDWIDTH: 16 MHz
   TELEMETRY BANDWIDTH: 5.8 & 6.8 MHz
   TELEMETRY BIT RATE: 9600 bps per channel
   RANGE: 300 ft reqd, 1100 ft expected (direct line-of-sight)
WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE

RF CAMR MOUNTED TO EMU HELMET

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

NOTE
Thermal Cover not shown for clarity
WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE (Continued)

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

GSE H/W
WIRELESS VIDEO SYSTEM (WVS) (Continued)

NOMENCLATURE (Concluded)

RF CAMR SHELL
WIRELESS VIDEO SYSTEM (WVS) (Continued)

RF CAMR ELECTRONICS

- Remote Head #1: 12mm, 30° H FOV (Gimbal mounted with Helmet light)
- Remote Head #2: 6mm, 56° H FOV (Gimbal mounted with Helmet light)
- Remote Head #3: 3.5mm, 85° H FOV (Fixed at center of Helmet)
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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>High</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>Low</td>
<td>L</td>
<td></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]
- **ALERT Msg Display**
  - Displays error msgs generated by system. Msgs start off flashing/blue and change to static/black when acknowledged (clicked). “Temp Caution” msg will start off flashing/yellow until acknowledged. Msgs disappear when problem fixed. Highest priority error displayed first. Five available msgs:
  - **Static XCVR**
    - Loss of comm between PGSC, PLB XCVR
  - **Static RF Camera**
    - Loss of comm between XCVR, RF Camr
  - **Bad Camera ID**
    - Mismatch between RF Camr selected and RF Camr transmitting ID
  - **Temp Alert**
    - Displays when RF Camr(PLB XCVR) temp is 5° from going into caution range (ERCA = -35° to -30° C or +80° to +85° C, XCVR = -40° to -35° C or +80° to +85° C)
  - **Temp Caution**
    - Displays RF Camr(PLB XCVR) temp has gone out of limits (ERCA < -35° C or >+85° C, XCVR < -40° C or >+85° C)

- **Select Page Icons**
  - [RF Camera, XCVR, Telemetry]
  - Provides selection between the three displays
SOFTWARE – RF CAMR PAGE

![Diagram of Wireless Video System (WVS) parameters](image-url)
**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>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>White Balance Control</strong></td>
<td>Determines how white balance set for Camr 2800K – PLB lights 6100K – Sunlight 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>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>S-Band Level</strong></td>
<td>Dynamic (default) – Pwr adjusted per signal strength seen at receiver (adjusted to be received at -40dB) Maximum – Sends signal at full pwr for signal strength problems</td>
</tr>
<tr>
<td><strong>Black Pedestal</strong></td>
<td>NOT USED. Brightness control varies from 0 to 100</td>
</tr>
<tr>
<td><strong>Zoom, Focus, LED Control</strong></td>
<td>NOT AVAILABLE. Future capabilities</td>
</tr>
</tbody>
</table>
**WIRELESS VIDEO SYSTEM (WVS) (Continued)**

**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</td>
<td>C</td>
<td>R</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>OFF:Min</td>
<td>Low</td>
<td>L</td>
<td>C</td>
<td>R</td>
</tr>
</tbody>
</table>

**Transceiver 1**

- **CMD Power**: Off
- **Antenna**: Auto

**Transceiver 2**

- **CMD Power**: Off
- **Antenna**: Auto

**Advance Controls**

- **Chroma Stablizer**: On
  - **IF**: Wide
  - **CMD Level**: Min
**SOFTWARE – XCVR PAGE (Concluded)**

<table>
<thead>
<tr>
<th>Feature</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><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 NOT USED</td>
</tr>
<tr>
<td><strong>Chroma Stabilizer</strong></td>
<td>NOT USED</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 NOT USED w/new spread spectrum XCVRs. Status shown under CMD PWR:LVL in top status area</td>
</tr>
</tbody>
</table>
**SOFTWARE – TELEMETRY PAGE (Concluded)**

### RF Camer System Telemetry

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RF CAMERA</strong></td>
<td>Displays RF Camr title</td>
</tr>
<tr>
<td><strong>Lens</strong></td>
<td>Displays currently selected lens</td>
</tr>
<tr>
<td><strong>UHF Signal Strength</strong></td>
<td>Displays cmd link signal strength in dB seen at RF Camr</td>
</tr>
<tr>
<td><strong>UHF RX Good</strong></td>
<td>NOT USED</td>
</tr>
<tr>
<td><strong>Pwr Voltage</strong></td>
<td>Displays RF Camr system voltage</td>
</tr>
<tr>
<td><strong>Pwr Amperes</strong></td>
<td>Displays RF Camr system current</td>
</tr>
<tr>
<td><strong>Temperature Electronics</strong></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><strong>Temperature L,C,R</strong></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>
</tbody>
</table>

### Transceiver Telemetry

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>XCVR 1,2 Temperature</strong></td>
<td>Displays XCVR temp in degC. Alert range = -40° to -35° C and +80° to +85° C. Caution range = &lt;-40° C and &gt;+85° C</td>
</tr>
<tr>
<td><strong>S-Band Signal Strength</strong></td>
<td>Displays return signal strength seen at XVCr in dB</td>
</tr>
<tr>
<td><strong>S-Band Antenna Select</strong></td>
<td>Displays which S-Band antenna the XCVR is using to get video signal</td>
</tr>
<tr>
<td><strong>S-Band Antenna Mode</strong></td>
<td>Displays XCVR antenna selection mode</td>
</tr>
<tr>
<td><strong>Power Voltage</strong></td>
<td>Displays XCVR system voltage</td>
</tr>
<tr>
<td><strong>Power Amperes</strong></td>
<td>Displays XCVR system current</td>
</tr>
<tr>
<td><strong>Quads 1,2</strong></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>Section</th>
<th>Page</th>
</tr>
</thead>
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<td>16-2</td>
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<td>16-3</td>
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<td>SSV TLM DNLK</td>
<td>16-4</td>
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<tr>
<td>SSV DEACTIVATION</td>
<td>16-5</td>
</tr>
<tr>
<td>MALS</td>
<td>16-6</td>
</tr>
<tr>
<td>16.1  PWR LED NOT LIT</td>
<td>16-6</td>
</tr>
<tr>
<td>16.2  FRONT PANEL LEDS NOT INDICATING CORRECTLY</td>
<td>16-6</td>
</tr>
</tbody>
</table>
SEQUEENTIAL STILL VIDEO (SSV)

SPECIFICATIONS

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

NOMENCLATURE

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

TOP DECAL

IN SEL
NTSC—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

SEQUENTIAL STILL VIDEO COMPRESSION ENCODER
P/N SED 16103222–301
SN [ ]
SEQUENTIAL STILL VIDEO (SSV) (Continued)

CAMCORDER VIA SSV

1. Config per dwg at right

2. Camcorder Settings

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

   O19
   - √TV Pwr – ON

   CC
   - √Wide Conversion Lens installed
   - PWR – CAMERA
   - Tape – Remove
   - √Viewfinder displays blinking yellow tape
   - Camr Settings
     - ✓AUTO LOCK – AUTO LOCK
     - FOCUS – AUTO
   - Multiuse Brkt, Clamp
     - Zoom in to check focus; zoom out to frame

3. SSV Settings

   - IN SEL – Y/C
     - Mode – 5 (may change if desired)
   - OUT RATE per FLIGHT PLAN
   - SSV Pwr – ON
   - √Pwr LED illum
   - √ENC DATA LED flickering
   - √FRM DATA LED flickering
   - √FILL FRM pulsing
SEQUENTIAL STILL VIDEO (SSV) (Continued)

TEST PATTERN VIA SSV

1. Perform SSV NOMINAL SETUP, step 1 (PHOTO/TV FS, SCENES)

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

SSV TLM DNLK

1. Perform SSV NOMINAL SETUP, step 1 (PHOTO/TV FS, SCENES)

2. SSV Settings
   IN SEL – NTSC
   Mode – 6
   OUT RATE per FLIGHT PLAN
   SSV Pwr – ON
   √Pwr LED illum
   √ENC DATA LED flickering
   √FRM DATA LED flickering
   √FILL FRM pulsing
SEQUENTIAL STILL VIDEO (SSV) (Continued)

SSV DEACTIVATION

1. **SSV**
   - SSV Pwr – off
   - Pwr LED not illuminated
   - ENC DATA LED not illuminated
   - FRM DATA LED not illuminated
   - FILL FRM LED not illuminated

L11 DC PWR 1 CAB PL – OFF (PDIP 2)

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

MALS

16.1 PWR LED NOT LIT

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

√DC Pwr from orbiter util

16.2 FRONT PANEL LEDs NOT INDICATING CORRECTLY

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

√Cables
√Video source
# Binoculars

## 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>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</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>
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<tr>
<td>Section</td>
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<tr>
<td>SPECIFICATIONS</td>
<td>18-2</td>
<td></td>
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<td>NOMENCLATURE</td>
<td>18-2</td>
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<tr>
<td>ACTIVATION/OPERATION</td>
<td>18-3</td>
<td></td>
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<tr>
<td>DEACTIVATION</td>
<td>18-3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>FIBERSCOPE LIGHT PWRUP (30 min)</td>
<td>18-4</td>
<td></td>
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</tr>
<tr>
<td>FIBERSCOPE LENS REPLACEMENT</td>
<td>18-6</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
FIBERSCOPE

SPECIFICATIONS

LIGHT PWR: Orbiter – 6V via IFM Breakout Box

NOMENCLATURE

<table>
<thead>
<tr>
<th>Lens Tip Adapter (FOV in deg)</th>
<th>10D</th>
<th>20D</th>
<th>40D</th>
<th>40S (Rt angle Lens)</th>
<th>80D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiberscope (SED 33103861–303)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Light Plug</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fiberscope Light</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Angle Free Knob (for RIGHT and LEFT)</td>
<td></td>
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<td></td>
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<tr>
<td>Angle Knob (for UP and DOWN)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Angle Free Knob (for RIGHT and LEFT)</td>
<td></td>
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<tr>
<td>Focal Ring</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Diopter Adjustment Ring</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Mini-Cam</td>
<td></td>
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</tr>
</tbody>
</table>

Mini-Cam to Fiberscope Adapter

FIBERSCOPE
FIBERSCOPE (Continued)

ACTIVATION/OPERATION

1. Unstow Fiberscope Kit, Fiberscope Light, if reqd

2. If Fiberscope Light reqd:
   Install Fiberscope Light Plug into Fiberscope Light
   Perform FIBERSCOPE LIGHT PWRUP, 18-4, steps 1 thru 12

3. If installed lens not desired:
   Unstow spare lens
   Perform FIBERSCOPE LENS REPLACEMENT, 18-6

4. If video dnlk(viewing) reqd:
   Unstow Fiberscope-to-Mini-Cam Adapter
   Screw Adapter into Mini-Cam body lens mount
   Mount Adapter to Fiberscope by aligning setter pin w/orange dot, rotate Adapter cw to lock
   Perform IN-CABIN MINI-CAM (MINI-CAM)
   Route Mini-Cam video to monitor or dnlk:
   A7   VID OUT MON 1(2) (DNLK) pb – push
       IN FLT DECK(MIDDECK) pb – push
   Push button on Adapter and rotate Fiberscope until slit mark on image edge at top of image
   OR
   Unstow,install Fiberscope Eyepiece

5. Adjust diopter until slit mark clearly visible
   Adjust Camr viewing by rotating up/down,left/right angle knobs while free knobs are in F posn
   Adjust focus by rotating focus ring

DEACTIVATION

1. If Fiberscope Light used:
   Perform FIBERSCOPE LIGHT PWRUP, 18-4, steps 13 thru 15
   Remove Fiberscope Light from Fiberscope Light Plug
   Stow Fiberscope Light

2. If Mini-Cam used:
   O19(MO58F)   TV PWR – OFF
   Remove Mini-Cam Adapter from Fiberscope
   Remove,stow Mini-Cam Adapter from Mini-Cam body

3. Remove,stow Fiberscope Eyepiece

4. Stow Fiberscope, Fiberscope Kit
FIBERSCOPE (Continued)

FIBERSCOPE LIGHT PWRUP (30 min)

1. Unstow:
   Multimeter
   Pin Kit (two 5-in 20 ga Pin/Pin Test Jumper Leads, two 24-in Minigrabbers, 5-Amp Fuse)
   Gray Tape
   IFM Breakout Box
   DC Pwr Cable

MA9N 2. Remove Battery Holder Assembly from Fiberscope Light

MO52J 3. \( \sqrt{\text{DC UTIL PWR MNA}} \) – 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
FIBERSCOPE (Continued)

FIBERSCOPE LIGHT PWRUP (30 min) (Continued)

6. Configure Multimeter for DC V (auto range)

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
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<td>OBSS PTU PAN AND TILT RANGES</td>
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<td>MONITOR INDICATIONS FOR LDRI VIDEO</td>
<td>19-11</td>
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</tbody>
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LASER DYNAMIC RANGE IMAGER (LDRI)

SPECIFICATIONS

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

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

MOUNTING INTERFACE: Bottom of ITVC (ITVC specifications in CCTV section)
POINTING CAPABILITY: Standard Pan Tilt Unit (PTU)
PAN RANGE: 179.8 deg
TILT RANGE: 300 deg
ITVC ILLUMINATOR: LDRI

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

NOTE
Thermal covers are not depicted

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

* Items 4 and 8 are subsets of item 1, the W601 Interface Cable Assembly
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

NOMENCLATURE (Concluded)

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

(Positive tilt range is limited by cable routed to LDRI)

Mounting Surface for PTU

Boom Surface

OBSS Interface Bracket

Boom Interface Bracket

Origin
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

FUNCTIONAL FLOW
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

ITVC, LDRI, AND PTU INTERACTIONS

Camera/PTU
Power

Sync/Cmds

Camera Heater
Power

PTU Heater
Power

ITVC

PTU Cmds

Video

LDRI

heaters
control sys
video sys

switching

Illuminator
intensifier
modulator

VPU

MISS
CAM

VSU

PL2

*j Pan and tilt values
for display on MON

jsc48037_121r2.cvx
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

OPP PANEL

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/dnlk ops

**LCS CMD/TLM (J107)**
- Provides PGSC interface for crew control, data, and telemetry for Laser Camr System (LCS) and ISIS Digital Camr (IDC)
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

OBSS PANEL

RSC PWR (S2)
- Provides CABIN PL3 POWER to RMS Sideview Camr (RSC) and its heater
- Heater must remain active for duration of mission

ITVC ENA (S3)
- ON sends an enable command to the OBSS ITVC
- SPEE PWR must be ON prior to ITVC enable
- OFF disables Camr. A 10-sec wait reqd before re-enabling

SPEE PWR (S4)
- ON closes K1 pwr relay in RMS End Effector. Pwr flows to OBSS ITVC/LDRI/PTU and to RSC illuminator. Upon initial relay closure, illuminator has pwr but not active
- After initial closure of K1 relay, cycling SPEE PWR sw to OFF, then ON will command RSC illuminator to full pwr (156 LEDs). Subsequent K1 relay cycling will take illuminator to med pwr (84 LEDs), then low pwr (30 LEDs), then OFF, and then back to full pwr
- Cycling K1 relay OFF, then ON will rest OBSS PTU pan and tilt values to zero; take LDRI to stby (Mode 1) and ITVC to manual state
LASER DYNAMIC RANGE IMAGER (LDRI) (Continued)

A7 PANEL

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

NOTE

**MUX1(2)R(L), MIDDECK pb**
- Selection of any of four VIDEO OUTPUT MUX pb followed by VID IN MIDDECK pb enables commanding of OBSS LDRI

**IRIS sw**
- IRIS sw provides gain cntl for LDRI Modes 3,4,5,6. Feedback is available in MON Lens Data in place of T-stop
- Gain range – 10 (brightest) to 280 (darkest). Default value – 280
- Gain applied on one of Modes 3(4,5,6) will apply to other three. Gain returns to default value by selecting Mode 1

**MODE, MENU pb**
- Six MODE/MENU pb, left to right, allow selection of LDRI modes 1 thru 6:
  - MODE 1 – STANDBY
  - MODE 2 – ILLUMINATOR
  - MODE 3 – 2D
  - MODE 4 – 2D GAMMA
  - MODE 5 – 3D
  - MODE 6 – 3D GAMMA

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

**MONITOR INDICATIONS FOR LDRI VIDEO**

**NOTE**

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

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

- **Pan, tilt for OBSS PTU**

- **Temp from LDRI Laser**

- **20.0 FOV  6.0 FT  T 280**

- **Random**

- **Fixed**

- **C-IN D-IN**

- **POWER ON OFF**

- **SELECT**

- **FUNCTION**

- **CONTRAST BRIGHTNESS COLOR TINT**

- **CAMB**

- **-112.5P +22.5T +28C**
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LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC)

LCS SPECIFICATIONS

- LASER WAVELENGTH: ≈1500 nm, near-IR
- LASER CLASSIFICATION: Class 3b
- OPERATIONAL RANGE: 4-10 ft
- LASER SPOT SIZE: 0.04 in @ 4.5 ft
- HAZARD ZONE:
  - Nominal Hazard Keep Out Zone (KOZ) – 5 ft
  - Worst Case Hazard KOZ – 64 ft
- LASER COVERAGE:
  - Detailed Area and Quick View Scan Modes – 30 x 30 deg
  - Continuous Line Scan Mode – Variable 2 to 42 deg
- LINEAR DETECTION ARRAY (LDA): 256-pixel linear array CCD w/13-bit intensity dynamic range
- LCH WEIGHT: 24.5 lb
- LCH DIMENSIONS: 11 in (L), 10 in (W), 5.6 in (H)

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

- LASER SCAN MODES:
  - Detailed Area – Two-directional scanning in rectangular pattern (used for "stop and stare" ops). Both X,Y mirrors used
  - Quick View – Low-resolution detailed area-scan mode
  - Continuous Line – One-directional scanning passes thru optical center of FOV (used for scanning ops). RMS provides scanning motion

- CREW CONTROL:
  - Hardware – LCC (Laser Camr Controller – A31p)
  - Software – LCC software shortcut (Shuttle Apps\IDC)
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCS NOMENCLATURE

1. Laser Orifice
2. RS422 Connector (J4)
3. Test Connector (J3)
4. COMMS/DATA Connector (J2)
5. POWER Connector (J1)
6. Ethernet Peripheral Device Connector (J5)
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCC SOFTWARE GUI

1. LCS Camera Controller
2. File
3. Tools
4. Window
5. Help
6. Database
7. C:\lcs\Config\lcs.dsc
8. Scanning
9. System Data
10. Detailed Area Scan
11. Start Area Scan
12. Quick View Scan
13. Start Quick View
14. Continuous Line Scan
15. Start Line Scan
16. Laser
17. Comm
18. Temp
19. Elec
20. Scan Status
21. GMT
22. Message
23. MSG ID
24. GMT:
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCC SOFTWARE GUI (Continued)

### Menu Bar [File, Tools, Help]

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>[File]</strong></td>
<td></td>
</tr>
<tr>
<td>Open</td>
<td>Allows user to open and view previous scan bin files. If several open, they are shown in order under File menu</td>
</tr>
<tr>
<td>Close</td>
<td>Closes displayed scan bin file. Appears only when viewing previous scans. If several open, only currently selected file will be closed with this function</td>
</tr>
<tr>
<td>Close All</td>
<td>Closes all scan bin files. Appears only when viewing previous scans. If several open, all files will be closed. Multiple scans collected in series will reside in RAM until cleared with this feature. Good housekeeping feature to use between scan AOIs</td>
</tr>
<tr>
<td>Load Database</td>
<td>Allows user to change current database. When load database option selected, a window will appear and allow user to select another database. Only files w/.dsc extension selectable</td>
</tr>
<tr>
<td>Exit</td>
<td>See LCC SOFTWARE EXIT DIALOGUE BOXES, 21-16</td>
</tr>
</tbody>
</table>

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

### [Window]

(Menu appears only when scan bin files being viewed)

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</thead>
<tbody>
<tr>
<td>Cascade</td>
<td>Cascades all currently opened scan bin files</td>
</tr>
<tr>
<td>Tile Vertically</td>
<td>Will ‘vertically tile’ all opened scan bin files. User can scroll up, down with vertical, horizontal slide bars</td>
</tr>
<tr>
<td>Tile Horizontally</td>
<td>Will ‘horizontally tile’ all opened scan bin files. User can scroll up with vertical slide bar</td>
</tr>
<tr>
<td>Arrange Icons</td>
<td>If multiple windows open and minimized in display area, will align minimized files</td>
</tr>
</tbody>
</table>

### [Help]

About

Displays window w/software-specific information; i.e., version of release

### Zoom Toolbar

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<tbody>
<tr>
<td>Fit 1:1</td>
<td>If displayed scan bin file has been zoomed in(out), button allows user to fit image to display area</td>
</tr>
<tr>
<td>Magnifier w/+ Sign</td>
<td>Zoom in button</td>
</tr>
<tr>
<td>Magnifier w/- Sign</td>
<td>Zoom out button</td>
</tr>
<tr>
<td>Magnifier in box</td>
<td>Allows user to select a box on display to zoom in on. Mouse arrow will change to magnifier. User will outline area w/two mouse clicks and view is fitted in display area</td>
</tr>
</tbody>
</table>

### 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)

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<tbody>
<tr>
<td>[Detailed Area Scan]</td>
<td>Detailed Area Scan Drop-down menu allows user to select one out of a possible 30 detailed area scans</td>
</tr>
<tr>
<td>Start Area Scan</td>
<td>Executes detailed area scan selected from drop-down menu</td>
</tr>
<tr>
<td>[Quick View Scan]</td>
<td>Detailed Area Scan Drop-down menu allows user to select one out of a possible 10 quick-view scans</td>
</tr>
<tr>
<td>Start Quick View</td>
<td>Executes quick-view scan selected from drop-down menu</td>
</tr>
<tr>
<td>[Auto-Exposure]</td>
<td>Use Auto-Exposure Enables Auto-Exposure. AE feature adds ~10 sec. Three initial scans taken and exposure calculated based on those scans</td>
</tr>
<tr>
<td>Custom Area</td>
<td>Enables Custom Area Box in image as reqd. Auto-exposure calculated from Custom Area Box</td>
</tr>
<tr>
<td>[Continuous Line Scan]</td>
<td>Detailed Area Scan Drop-down menu allows user to select one out of a possible 30 continuous line scans</td>
</tr>
<tr>
<td>Start Line Scan</td>
<td>Executes continuous line scan selected from drop-down menu</td>
</tr>
</tbody>
</table>
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

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

LCC SOFTWARE GUI (Concluded)

5. System Data Page [Temperature (degC), Electrical]
   (One of two pages. Gives user insight into various temp, elec values of components inside LCH. Values are software FDA’d according to limits set in current database. An out of allowable limit value is backlit in yellow and causes a msg to be displayed)

   [Temperature] Displays LCH component temp values in deg Celsius
   [Electrical] Displays LCH component elec values. Values are milliWatts, milliamps, and Volts

   (Displays on, off status of Laser diode)

   Laser On (Green) Scan in progress. Backlit in green while laser diode on
   Laser Off (Blue) Scan not in progress. Backlit in blue while laser diode off
   Laser ? (Gray) No insight into LCH. Backlit in gray when no LCH to LCC Ethernet connectivity

7. Comm
   Light displays Ethernet communication state between LCC, LCH
   Green Light – Indicates good Ethernet connection
   Yellow Light – Indicates bad Ethernet connection

8. Temp
   Light displays temp status of LCH components
   Green Light – Backlit in green when all LCH component temp values within ranges specified by current database
   Yellow Light – Backlit in yellow when one or more values out of limits

9. Elec
   Light displays elec status of LCH components
   Green Light – Backlit in green when all elec values within ranges specified by current database
   Yellow Light – Backlit in yellow when one or more values out of limits

10. Scan Status (Blank, Complete, Vertical Resolution)
    Blank When LCS software launched and no scans have been executed
    Complete Displays last scan line collected or Stop Scan button selected
    Vertical Resolution While scan in progress, field displays vertical resolution of scan and current line being scanned; i.e., 211/512 means current line being scanned and recorded on LCC is 211 and vertical resolution is 512

11. Message Area
    GMT Displays GMT of time tagged off-nominal message
    Message Displays text description of error messages. Any messages displayed here are logged into system log
    MSG ID Display unique six-digit number that corresponds to error message that appears in message area
    CLR Clears current error messages displayed in message area. Button will invoke a dialogue box asking user if he wants to clear message area
    GMT DDD/HH:MM:SS Displays GMT based on A31p system clock. Once GMT set via Tools menu, LCC will sync up to time kept on LCH, which is accurate
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

**IDC SPECIFICATIONS**

IDC DIMENSIONS: 6 in (L), 5 in (W), 2 in (D)
IDC ELECTRONIC COMPONENTS: Adimec-2000m/S and Pleora i-port PT1000-CL
IDC ELECTRONIC PWR: 12V conditioned pwr from LCH

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

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

IDC NOMENCLATURE

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

50mm Lens
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

IDC SOFTWARE GUI

ISIS Digital Camera for OBSS

Other Commands…

1. GMT: DD:HH:MM:SS
2. X: xxxx Y: yyyy
3. Cam Temp: ## C
4. Power On
5. Power Off
6. CC
7. AE
8. SP
9. Default Scenario
10. Scan Lo-Res
11. Scan Hi-Res
12. Acquire Set
13. Acquire One
14. View File…
15. Gain: #X
16. Exp: ###### usec
### Other Commands (Pulldown menu provides other commands w/hot keys)

<table>
<thead>
<tr>
<th>Advanced Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[F2]</td>
<td>Brings up &quot;Add Notation&quot; box for adding text to tiff. This text will be added to all tiffs; so, clear it if added to text box</td>
</tr>
<tr>
<td>[F5]</td>
<td>Toggle Summary View</td>
</tr>
<tr>
<td>[F6]</td>
<td>Toggle Image Mode</td>
</tr>
<tr>
<td>[F7]</td>
<td>Zoom In</td>
</tr>
<tr>
<td>[F8]</td>
<td>Zoom Out</td>
</tr>
<tr>
<td>[F9]</td>
<td>Reset Brightness and Contrast</td>
</tr>
<tr>
<td>[F10]</td>
<td>Reset Auto Exposure Aperture to Default</td>
</tr>
<tr>
<td>[F11]</td>
<td>Toggle Auto Exposure Aperture Visibility</td>
</tr>
<tr>
<td>[F12]</td>
<td>Find Auto Exposure Aperture</td>
</tr>
</tbody>
</table>

**Display Area**
- Shows the tiff or last image collected

**Status Bar 1**
- GMT: Displays current time
- Zoom Level: Fit, 1X, 2X, 4X, 8X
- Mouse Position: Shows "X,Y" positions of mouse
- Camr Temperature: Temperature of Camr in Celsius
- Comm Status Light: Blinking green light when in nominal case; static while imaging

**Power On/Off, Auto Exposure (AE), Color Coded (CC), Scenario File Drop List/Brightness and Contrast Controls**
- [Power On]/[Power Off]: Buttons control the pwr to the IDC
- [CC]: Allows user to color code the over and under exposed areas of image
- [AE]: Allows selection of auto-exposure capability
- AE Setpoint Slide Bar: Allows user to set starting exposure for AE algorithm. Bar can be used when Avg, Sub, and Peak algorithms selected
- Scenario File Drop List: Drop down list allows user to select Gain and Exposure settings for all image acquisition buttons that depend upon light scenario
- Brightness and Contrast: When user switches into “Image Mode”, scenario drop down list turns into "Brightness and Contrast" controls, allowing user to manipulate viewable image. Note: Brightness and Contrast has no control over Camr brightness or contrast

### Image Command Area

<table>
<thead>
<tr>
<th>Image Acquisition Buttons</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan Lo-Res</td>
<td>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</td>
<td>Continuously saves full images to disk</td>
</tr>
<tr>
<td>Acquire Set</td>
<td>Image(s) saved to disk. Acquires bracket set of images</td>
</tr>
<tr>
<td>Acquire One</td>
<td>Image saved to disk. Acquires one image with no exposure control from AE</td>
</tr>
<tr>
<td>Avg</td>
<td>Selects averaging AE algorithm. Exposes based on pixels inside box</td>
</tr>
<tr>
<td>Sub</td>
<td>Selects sub image AE algorithm. Takes two images</td>
</tr>
<tr>
<td>Peak</td>
<td>Selects peak AE algorithm. Exposes based on brightest pixels in box</td>
</tr>
<tr>
<td>View and Save Files</td>
<td>Allows user to select a file from a directory to view or (when holding &quot;CTRL&quot; key while clicking on &quot;Save File To…&quot; button) select a directory indicating where subsequent images will be saved. Green arrows allow user to quickly browse thru images alphabetically</td>
</tr>
</tbody>
</table>

### Status Bar 2
- Contains status of current operation, gain and exposure settings for image being displayed, Status Bar Error Advisory, Status Error Strings, and Normal Operation Strings

---

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

IDC SOFTWARE GUI (Continued)

Advanced Settings

8

Acquire One

Exposure
Gain

Acquire Set

Select Image:
Exposure
Gain
or Fraction

9

Scan

Select Type:
Lo-Res
Hi-Res

Exposure
Gain
Decimation
Period

10

Do Self Test
Black Level

11

Cancel
Reset to Defaults
Accept

Usec
Decimation
Period

Msec
**IDC SOFTWARE GUI (Concluded)**

| **8** | *Acquire One* Settings  
(Allows user to set exposure and gain settings for *Acquire One* cmd which acquires a single image from Camr) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>[Exposure]</strong> User may set exposure from 25 usec to 80025 usec</td>
</tr>
<tr>
<td></td>
<td><strong>[Gain]</strong> User may set Gain from 1X to 8X</td>
</tr>
</tbody>
</table>

| **9** | *Acquire Set* Settings  
(user to set exposure and gain settings for *Acquire Set* cmd. Each image acquired in set can have a different setting for exposure and gain. [Display] checkbox will determine if image is to be displayed when acquired) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>[Select Image]</strong> As a default, user may select up to 7 images</td>
</tr>
<tr>
<td></td>
<td><strong>[Exposure]</strong> User may set exposure from 25 usec to 80025 usec</td>
</tr>
<tr>
<td></td>
<td><strong>[Gain]</strong> User may set Gain from 1X to 8X</td>
</tr>
<tr>
<td></td>
<td><strong>[or Fraction]</strong> Shows denominator value for exposure value. A &quot;1&quot; is assumed for the numerator</td>
</tr>
</tbody>
</table>

| **10** | *Scan* Settings  
(Allows user to exposure, gain, and decimation settings for low/high resolution continuous scans) |
|--------|----------------------------------------------------------|
|        | **[Lo-Res]/[Hi-Res] Buttons** User selects which scan to set attributes to:  
Lo-Res – Scans are displayed only and not saved to disk  
Hi-Res – Scans are displayed and saved to disk |
|        | **[Exposure]** User may set exposure from 25 usec to 80025 usec |
|        | **[Gain]** User may set Gain from 1X to 8X                 |
|        | **[Decimation]** User may select a decimation level between 1-16. When decimation is a high number, time for image to be displayed on screen is faster due to smaller size and lower quality of image |
|        | **[Period]** Sets scan period. Allows user to throttle rate of image/file creation for some scan scenarios |

| **11** | *Do Self Test* Command  
Queries IDC for an image test pattern which is then displayed on main display window. Test image is also stored to disk |
|--------|---------------------------------------------------------------|
|        | *Black Level* Input Box  
Sets Camr’s “Black Level” threshold for all acquired images. Can be set from 0 to 4095 |
|        | *Reset to Defaults* Command  
Restores application defaults applied at startup to all settings. Holding CTRL and pressing "Reset to Defaults" will restore project defaults established in DCCS.ini file |
LASER CAMR SYSTEM (LCS)/INTEGRATED SENSOR INSPECTION SYSTEM DIGITAL CAMR (IDC) (Continued)

LCS/IDC COMBINED NOMENCLATURE

1. ISIS Digital Camr (IDC)
2. 50mm Lens
3. Top View (from IDC perspective)
4. LC-I 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)

LCC SOFTWARE EXIT DIALOGUE BOXES

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

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

- **Shutdown?**
  - This will shut down LCH and IDC.
  - Note: An LCH pwr cycle will be reqd to resume sensor ops.

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

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

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

- **Shutdown?**
  - OK will exit LCC software only.
  - OK
  - Cancel
For desktop dnlk config to work correctly, ensure there is a load on A31p Video Out port (video coming out of laptop into pwr input, such as AVIU(V10))

1. Video destination properly configured per LCC ACTIVATION, step 1 (Cue Card, LCS) and pwr
   - MO58F TV PWR – ON
   - AVIU HI-Z/75 – 75
   - CC PWR SELECT – 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' tab
6. 'Displays' tab against fig 20-1 cases' circled areas and perform matching case steps below:

**Case 1**
- Sel 'OK'
- MO58F
- TV PWR – ON
- AVIU
- LCS Video Cable connected to J1
- LCS Video Adapter connected to A31p Video Out port
- Repeat steps 4-6

**Case 2**
- Sel 'OK'
- MO58F
- TV PWR – ON
- AVIU
- LCS Video Cable connected to J1
- LCS Video Adapter connected to A31p Video Out port
- Repeat steps 4-6

**Case 3**
- Click on red button in Case 3 circle
- Display looks like Case 1
- Sel 'OK'
- When ATI Property Page appears:
  - Sel 'Yes'

**Case 4**
- MO58F
- TV PWR – ON
- AVIU
- LCS Video Cable connected to J1
- LCS Video Adapter connected to A31p Video Out port
- Repeat steps 4-6

Figure 20-1.- Multiple monitors and ATI mobility fire GL 7800 display tab.
66.  (Concluded)

~

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

Sel 'OK'

AVIU
LCS Video Cable connected to J1
A31p
LCS Video Adapter connected to A31p Video Out port
Repeat steps 4-6
If no longer Case 4:
| Repeat step 6
If still Case 4:
  Sel 'OK'
  Replace entire LCS Video Cable (including A31p Video Adapter)
  Repeat steps 4-6
  If no longer Case 4:
  | Repeat step 6
  If still Case 4:
  | Sel 'OK'
  Replace AVIU
  Repeat steps 4-6
  If no longer Case 4:
  | Repeat step 6
  If still Case 4:
  | Sel 'OK'
  Replace A31p
  Repeat steps 1-6
  If no longer Case 4:
  | Repeat step 6
  If still Case 4:
  \nMCC

7. ‘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, 20-17 for desktop dnlk ops

A31p
1. Desktop
   Right click
   Sel 'Properties'

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

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

4. TV display tab
   If Red(Gray) tab:
   |   Go to step 5
   If Green tab:
   Click Green tab. Tab automatically turns red after selection (see fig 20-1)
   Sel 'Apply'

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

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

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

8. Desktop
   Right Click
   Sel 'Properties'
9. 'Display Properties' Dialog Box
   Sel 'Settings'
   Move Screen Area slidebar to 1600 x 1200
   √Colors – True Color (32 bit)
   If not, sel True Color (32 bit) from drop down menu
   Sel 'Apply'
   When 'Display Properties' dialog box opens:
      Sel 'OK'
   When 'Monitor Settings' dialog box opens:
      Sel 'Yes' (within 15 sec)
      If 15 sec window missed:
         Repeat step 9
   When 'Display Properties' dialog box opens:
      Sel 'OK'
### BATTS & FUSES

#### BATTS & FUSES 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>NONE</td>
</tr>
<tr>
<td>BINOCULARS – 14 X40 GYRO</td>
<td>AA (6)</td>
<td>CC Remote</td>
<td>NONE</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LCD MONITOR NIKON FLASH</td>
<td></td>
<td></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>
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<tr>
<td>CC Batt Charger</td>
<td>N/A</td>
<td>N/A</td>
<td>3A</td>
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<tr>
<td>CC Remote</td>
<td>AA (2)</td>
<td>GYRO BINOCULARS LCD MONITOR NIKON FLASH</td>
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<td>CC Remote</td>
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<tr>
<td>NIKON FLASH</td>
<td>AA (4)</td>
<td>CC Remote</td>
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<tr>
<td>PHOTOFLOOD</td>
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<td>N/A</td>
<td>1.7A</td>
<td>NONE</td>
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<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</td>
<td>N/A</td>
<td>N/A</td>
<td>2A</td>
<td></td>
</tr>
<tr>
<td>ENCODER</td>
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</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>1A (5)</td>
<td>1/2A (2)</td>
</tr>
<tr>
<td>2A (2)</td>
<td>1A (2)</td>
</tr>
<tr>
<td>3A (5)</td>
<td>2A (2)</td>
</tr>
<tr>
<td>5A (5)</td>
<td>7.5A (2)</td>
</tr>
<tr>
<td>7.5A (2)</td>
<td>10A (2)</td>
</tr>
<tr>
<td>10A (2)</td>
<td></td>
</tr>
</tbody>
</table>