A. CAMERA/GYRO PLATFORM ASSEMBLY

ASSEMBLY/INTEGRATION STEPS TO BE SPECIFIED
OPTICAL ALIGNMENT VERIFICATION TO BE SPECIFIED

B. PRE-FLIGHT BATTERY CHECK/CONDITIONING

B.1. BATTERY CHARGING
B.1.1 [ ] GYRO BATTERY #1 TO FULL CHARGE (7 HR)
B.1.2 [ ] GYRO BATTERY #2 TO FULL CHARGE (7 HR)
B.1.3 [ ] G4/15 LAPTOP BATTERY TO FULL CHARGE (>97%, 4 LIGHTS)
B.1.4 [ ] G4/15 SPARE BATTERY TO FULL CHARGE (>97%, 4 LIGHTS)
B.1.5 [ ] WINBOOK BATTERY TO FULL CHARGE
B.1.6 [ ] CCD POWER SUPPLY BATTERY TO FULL CHARGE
B.1.7 [ ] G4/17 BATTERY #1 TO FULL CHARGE
B.1.8 [ ] G4/17 BATTERY #2 TO FULL CHARGE
B.1.9 [ ] CCD CAMERA TO FULL CHARGE

B.1. BATTERY REPLACEMENT
B.2.1 [ ] VERIFY F5 BATTERIES @ 1.5V, REPLACE IF NEEDED
B.2.1 [ ] VERIFY PENTAX BATTERY *TBD* AT ___ VOLTS

C. CAMERA PREPARATION

C.1. PENTAX CAMERA IN-FLIGHT PREPARATION
C.1.1 [ ] LOAD ISO 64, 36 EXP FILM
C.1.2 [ ] VERIFY f STOP WIDE OPEN @ f/8
C.1.3 [ ] TAPE f STOP @ f/8 POSITION
C.1.4 [ ] VERIFY FOCUS @ INFINITY
C.1.5 [ ] TAPE FOCUS @ INFINITY
C.1.6 [ ] VERIFY EXPOSURE MODE IS BULB
C.1.7 [ ] REMOVE & STOW SKYLIGHT FILTER
C.1.8 [ ] RECOVER LENS

* C.1.2 - C.1.6 may be done before boarding aircraft
  but must be checked in re-checked flight

C.2 NIKON CAMERA IN-FLIGHT PREPARATION
C.2.1 [ ] LOAD ISO 800, 36 EXP FILM
C.2.2 [ ] VERIFY f STOP WIDE OPEN @ f/4.5-5.6
C.2.3 [ ] TAPE f STOP @ f/4.5-5.6 POSITION
C.2.4 [ ] VERIFY FOCUS @ INFINITY
C.2.5 [ ] TAPE FOCUS @ INFINITY
C.2.6 [ ] VERIFY EXPOSURE MODE IS BULB
C.2.7 [ ] VERIFY LENS VIBRATION REDUCTION MODE 1 SELECTED
C.2.8 [ ] TAPE OVER VR MODE SELECTOR SWITCH
C.2.9 [ ] VERIFY AUTOFOCUS ON LENS IS DISABLED
C.2.10 [ ] REMOVE & STOW SKYLIGHT FILTER
C.2.11 [ ] RECOVER LENS

* C.2.2 - C.2.9 may be done before boarding aircraft but must be checked in re-checked flight

C.3 VIDEO CAMERA IN-FLIGHT PREPARATION
C.3.1 [ ] VERIFY VIDEO TAPE INSERTION
C.3.2 [ ] REMOVE & STOW SKYLIGHT FILTER
C.3.2 [ ] RECOVER LENS
C.3.3 [ ] TURN POWER SWITCH ON
C.3.4 [ ] CHECK/VERIFY VCR/CAM SWITCH IN “CAMERA” POSITION
C.3.5 [ ] SET EXPOSURE MODE F/STOP
C.3.6 [ ] SET EXPOSURE MODE SHUTTER

D. ELECTRICAL CONTROL CONNECTIONS

D.1 PENTAX TO UMBRAPHILE BOX
D.1.1 [ ] CONNECT PENTAX 3-PIN SHUTTER CABLE TO BODY
D.1.2 [ ] TAPE/SECURE CONNECTOR TO BODY
D.1.3 [ ] CONNECT PENTAX MINI-PLUG TO UMBRAPHILE BOX

D.2 F5 TO UMBRAPHILE BOX
D.2.1 [ ] CONNECT F5 10-PIN CONTROL CABLE TO BODY
D.2.2 [ ] VERIFY CONNECTOR CABLE LOCKED IN PLACE
D.2.3 [ ] F5 BLACK (COMMON) PLUG TO BLACK UPHILE BOX JACK
D.2.4 [ ] F5 YELLOW (SHUTTER) PLUG TO RED UPHILE BOX JACK
D.2.5 [ ] F5 BLUE WITH EXTENDER (VR/METER) TO TOP UPHILE JACK

D.3 UMBRAPHILE BOX TO G4/15
D.3.1 [ ] VERIFY/TAPE UPHILE/DB25 TO APPLETALK CONNECTOR
D.3.2 [ ] CONNECT/TAPE APPLETALK TO KEYSPAN ADAPTER PORT 2
D.3.1 [ ] CONNECT KEYSPAN USB TO 15" POWERBOOK USB PORT 1

D.4 VIDEO AND CCD OUTPUT
D.4.1 [ ] USB CABLE FROM THINKPAD (TOP PORT) TO SBIG CAMERA
D.4.2 [ ] FIREWIRE CABLE FROM POWERBOOK TO SONY VIDEO CAMERA
E. ELECTRICAL POWER CONNECTIONS

E.1  SBIG CCD
E.1.1 [ ] VERIFY SBIG DC-TO-DC SUPPLY POWER OFF
E.1.2 [ ] CONNECT SBIG TO DC-TO-DC POWER SUPPLY
E.1.3 [ ] CONNECT DC-TO-DC POWER SUPPLY TO BATTERY

E.2.1 [ ] VERIFY DC-TO-400HZ INVERTER #1 POWER OFF
E.2.2 [ ] VERIFY DC-TO-400HZ INVERTER #2 POWER OFF
E.2.3 [ ] CONNECT GYRO #1 POWER CABLE TO INVERTER #1
E.2.4 [ ] CONNECT GYRO #2 POWER CABLE TO INVERTER #2

F. CAMERA PLATFORM RIGGING
AS FLIGHT CONDITIONS PERMIT

F.0  SET UP SUSPENSION HARDWARE *TBD*
Pending QF94 Inspection, Measures, and Test

F.1  PLATFORM INSTALLATION & SETUP
F.1.1 [ ] SUSPEND FROM COG TO FLIGHT DECK ROOF VIA
BUNGIE AND TBD ATTACH HARDWARE
F.1.2 [ ] REMOVE PISTOL GRIP HANDLE
F.1.3 [ ] ROUTE & SECURE POWER AND CONTROL CABLES
DOWNWARD (AND TO RIGHT) FROM COG
F.1.4 [ ] REMOVE ALL 4 LENS COVERS
[PENTAX ] [F5 ] [SBIG ] [VIDEO ]
F.1.5 [ ] VERIFY MECHANICAL OPTICAL ALIGNMENTS
(FIDUCIAL MARKINGS ON PLATFORM/CAMERAS)

F.2  PLATFORM ADJUSTMENT & ALIGNMENT
F.2.1 [ ] VERIFY ALL CAMERA/GYRO SUPPORT BOLTS SECURE
F.2.2 [ ] ADJUST AND SECURE U-BOLT SUSPENSION POINT
FOR 15 DEGREE ELEVATION ANGLE
F.2.3 [ ] ADJUST R/L SLIDER FOR HORIZONTAL BALANCE
F.2.4 [ ] ADJUST EQUILIBRIUM ROTATION FOR WINDOW POINTING

F.3  WINDOW & OPTICAL ALIGNMENT AND PREP
F.3.1 [ ] CLEAN WINDOW INTERIOR (DETERGENT & AMMONIA)
F.3.2 [ ] PLACE SOLAR FILTER ON WINDOW FOR QUICK REMOVAL
F.3.4 [ ] HANG BLACK CLOTH BEHIND RIG (and Self)

F.4  VERIFY ALIGNMENT OF VIDEO & FILM CAMERAS
F.4.1 [ ] CONNECT CAMERA-TO-POWERBOOK FIREWIRE CABLE
F.4.2 [ ] WAKE/BOOT POWERBOOK
F.4.3 [ ] LAUNCH IMOVIE
F.4.4 [ ] ACQUIRE TARGET (FILTERED SUN/LANDSCAPE)
F.4.5 [ ] CHECK F5-TO-VIDEO CENTERING
F.4.6 [ ] CHECK PENTAX-TO-VIDEO CENTERING
F.4.7 [ ] SLEEP POWERBOOK
G. SBIG CCD CAMERA INITIALIZATION

T MINUS TIME: 1H 30M (MAXIMUM)

G.1  INITIALIZATION
G.1.1  [ ] BOOT THINKPAD – WAIT UNTIL BOOT COMPLETE
G.1.2  [ ] TURN ON DC-TO-DC SUPPLY FOR SBIG CCD
G.1.3  [ ] PLUG USB CABLE INTO TOP PORT OF THINKPAD
G.1.4  [ ] CONFIRM 3 PAIRS OF TONES TO MOUNT USB DEVICE

G.2  CCD FOCUS CHECK WHEN POSSIBLE
G.2.1  [ ] From WINDOWS START menu: Programs --> SBIG --> CCDOPS
G.2.2  [ ] In Small Window: Click SETUP
G.2.3  [ ] In new Window –OR– Under CAMERA at Top
        Set Resolution Mode = Medium [OK]
G.2.4  [ ] In new Window –OR– Under CAMERA at Top
        Set Exposure Time = TBD
        Full Frame (Don’t Select Dark Frame)
        Update Mode Automatic [OK]
G.2.5  [ ] ACQUIRE SUN THROUGH SOLAR FILTER OR
        DISTANT LANDSCAPE WITHOUT FILTER
G.2.6  [ ] Verify/Adjust Focus as needed
G.2.7  [ ] Verify/adjust optical alignment with VIDEO
G.2.8  [ ] Close FOCUS Window and exit CCDOPS
G.2.8a [ ] Reboot as contingency

G.3  CCD IMAGE ACQUISITION SEQUENCE INITIALIZATION
G.3.1  [ ] Double-click MaximDL ICON on Desktop
G.3.2  [ ] From VIEW menu, select CCD Control Window
G.3.3  [ ] In Maxim CCD Camera Window, Verify/Select:
        Camera Model    SBIG Dual Chip
        Connect to      USB
        Guider ABG      Off
        Binning Mode    On-Chip
        Swap Chips      Off
        Priority        High
G.3.4  [ ] In same window, right side, click CONNECT.
        Verify Main CCD Camera subwindow says:
        SBIG Dual Chip, Cooler is Off, Setpoint XXX
G.3.5  [ ] In Maxim CCD window, click:
        Cooler On (right side)
        Cooler (left side) and set point -15C
G.3.6  [ ] From FILE menu (may be grey, OK) select
        Run Script. SELECT – do NOT Open
        FinalScript.vbs in Desktop/Antarctica
H. POWER UP GYROS

T MINUS TIME: 40M (minimum) TO 1H

H.1.1 [ ] POWER ON GYRO #1
H.1.2 [ ] VERIFY GREEN LIGHT ON INVERTER #1
H.1.3 [ ] LISTEN FOR SPIN-UP ON GYRO #1
H.2.1 [ ] POWER ON GYRO #1
H.2.2 [ ] VERIFY GREEN LIGHT ON INVERTER #1
H.2.3 [ ] LISTEN FOR SPIN-UP ON GYRO #1

I. EYEPATCH ON

T MINUS TIME: APPX. 45M

J. G4/15 & UMBRAPHILE STARTUP

T MINUS TIME: 40M TO 1H

J.1 G4/15 INITIALIZATION
J.1.1 [ ] OPEN LID TO WAKE FROM SLEEP
J.1.1a [ ] REBOOT IF NEEDED
J.1.2 [ ] VERIFY CLASSIC (OS 9) ENVIRONMENT RUNNING
J.1.2b [ ] START UP CLASSIC ENVIRONMENT IF NOT RUNNING

J.2 SYSTEM CLOCK TO UTC
J.2.1 [ ] SET SYSTEM CLOCK TO GPS/UT VIA DATE/TIME
SYSTEM PREFERENCES

J.3 UMBRAPHILE STARTUP/TEST
J.3.1 [ ] LAUNCH APL 3.1.0e (from Analysis Tab)
J.3.2 [ ] LOAD (OPEN) UMBRA230 (from UMBRAPHILE FOR TSE2003
FOLDER)
J.3.3 [ ] CLICK [OK] AFTER LOADING
J.3.4 [ ] SELECT TEST SERIAL PORT
J.3.5 [ ] Set: Length of Test = 1 s
J.3.6 [ ] NOTE PENTAX [___] and F5 [___] frame counters
   Note orientation of film rewind levers
J.3.7 [ ] Watch film rewind levers, listen to cameras and [OK]
J.3.8 [ ] Verify that a single exposure was taken on each
   camera and that film advanced.

J.4 UMBRAPHILE TOTALITY SEQUENCE
J.3.4 [ ] SELECT RUN CONTROLLER FROM UMBRAPHILE MENU
J.3.5 [ ] VERIFY PORT 2 SELECTED and CLICK [OK]
J.3.6 [ ] CLICK OK TO DEFAULT PORT SETUP PARAMETERS
J.3.7 [ ] CLICK OK TO REPROGRAM PORT
J.3.8 [ ] VERIFY LAT/LONG/ALTITUDE, UPDATE IF NEEDED
   Lat = ____________, Long = ____________, ALt = ______
J.3.9 [ ] CLICK OK FOR COORDINATES
J.3.10 [ ] IMPORT DATA FILE: ECLIPSE-23NOV2003_Q747.DATA
J.3.11 [ ] UT = System Clock + [000000] HHMSS.fff
J.3.12 [ ] CLICK OK TO CREATE/RUN EXPOSURE SEQUENCE
... and, away we go!!!

K. START VIDEO CAMERA RECORD/STREAM
T-MINUS TIME: 25M TO 40M

K.1.1 [ ] LAUNCH IMOVIE ON G4 COMPUTER
K.1.2 [ ] TURN ON VIDEO IF NOT ON
K.1.3 [ ] SET VIDEO TO RECORD
K.1.4 [ ] VERIFY VIDEO STREAMING TO IMOVIE

L. HANG CAMERA PLATFORM
T-MINUS TIME: ASAP AFTER START OF RUN
OR EARLIER IF PERMITTED

L.1.1 [ ] HANG PLATFORM IF NOT HUNG
L.1.2 [ ] ADJUST ROTATION SO LOS IS ORTHOGONAL TO WINDOW
L.1.3 [ ] SECURE CABLED DOWNWARD FROM VERTICAL COG
L.1.4 [ ] CHECK/ADJUST BALANCE AND TORQUES
L.1.5 [ ] ACQUIRE SUN THROGH SOLAR FILTER ASAP

M. EXECUTE CCD IMAGE ACQUISITION SEQUENCE
CII-MINUS TIME: 10M

M.1.1 [ ] *** WAIT Until CII minus 10 MINUTES ***
M.1.2 [ ] Click OPEN at CII minus 10 minutes
Notes: 25 Bias/Dark Frames (4 minutes)
150 images frames 10, 20, 40ms @ 4s cadance
Total Execution Time = 19.5m
175 files, 641 MB, in Desktop:EclipseFrames:

N. ENABLE VR KEEP-ALIVE CIRCIT
CII-MINUS TIME: 3M TO 5M

O. SOLAR FILTER OFF/CCD BLOCKER ON
CII-MINUS TIME: -20S

P.1.1 [ ] Flip Down CCD Blocker
P.1.2 [ ] Remove Solar Filter From Window
**** TOTALITY ****

Q. EYEPATCH OFF  
   CII-PLUS TIME: +5S

R. REMOVE CCD BLOCKER  
   CII-PLUS TIME: +10S

S. REPLACE CCD BLOCKER  
   CIII-MINUS TIME: -10S

**** END TOTALITY ****

U. REPLACE CCD BLOCKER  
   CIII-MINUS TIME: -10S

V. SLEW (ROTATE) PLATFORM OFF SUN  
   CIII-PLUS TIME: +20S

W. POWER DOWN GYROS  
   CIII-PLUS TIME: ASAP AFTER STEP R

X. SHUT DOWN CCD CAMERA  
   CIII-PLUS TIME: APPX +10M

X.1.1 [ ] Wait for script completion then [OK] MaximDL program
X.1.2 [ ] Turn off Cooler, Exit MaximDL Program
X.1.3 [ ] Turn off 12V DC Power Supply
X.1.4 [ ] Disconnect/Insulate 12V Battery for CCD Power Supply
X.1.5 [ ] Disconnect SBIG Power and USB Cables
X.1.6 [ ] Sleep ThinkPad
Y. DISMOUNT/DEINTEGRATE GYRO PLATFORM
CIII–PLUS TIME: ANYTIME AFTER STEP X

Z. CELEBRATE
CIII–PLUS TIME: ANYTIME AFTER STEP Y

Z.1.1 [ ] Deploy Eclipse Flag
Z.1.2 [ ] Serve Egg
Z.1.3 [ ] Creams Toast to 8 April 2005