<table>
<thead>
<tr>
<th>PART NO</th>
<th>S/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>SKB32100074-363</td>
<td>1002</td>
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</tbody>
</table>
102:55 TD + 8 1 REV "STAY" FROM MSFN (PDI+20)

OxID VENT - CLOSE (20-40 P32a ~ 6 min.)
V37E00E
FUEL VENT - OPEN
PRPLNT TEMP/PRESS MON - DES 1,2
MODE CONTROL (PGNS) - ATT HOLD
V76E
MODE CONTROL (AGS) - OFF
SYS A&B QUAD 1,2,3,4 (8) - OPEN, tb-gray
SYS A&B MAIN SOV(2) - OPEN, tb-gray

SEQ CAMERA - OFF

CB(16) EPS: ASC ECA CONT - Close
BAT 5,6 - OFF/RESET
INVERTER - 2
CB(11) EPS: INV 1 - Open

CB(11) STAB/CONT: DECA PWR - Open
CB(16) STAB/CONT: DES ENG OVRD - Open
EPS: ASC ECA CONT - Open
INST: CWEA - Open Then Close (DES REG-OFF)
Cycle Temp Monitor

*047 R ______ Sin Az Comp To MSFN
*053 R ______ Cos Az Comp To MSFN
*623 R (+0 YAW Steering)

*544 R ______ X Gyro Coeff
*545 R ______ Y Gyro Coeff
*546 R ______ Z Gyro Coeff

*400 + 6E Calibrate Gyros

*232 R +00600 Ins Alt
*465 +00320 E Ins HDot

*400R (+ 0 Calibration Complete In 5 min 2 sec)
Verify Cabin Press
PRESS REG A&B - CABIN
SUIT GAS DIVERTER - Push/CABIN
CABIN REPRESS - AUTO

DOFF HELMET & GLOVES
103:08
PDI+32
TIG-1:20

P57E
04 06 00001
00003 REFSMMAT
PRO

05 06 00010
00001 00110 REFSMMAT & Gravity
PRO

V16 N20E
Monitor Gravity Measurement
NO ATT Lt - On Then Off, Twice

+04200
+31800
+03500

KEY REL

06 04 +______ Gravity Err Angle
V32E Remeasure Gravity
PRO

06 22 ICDU Angles
PRO
NO ATT Lt - On Then Off

06 05 ________ Angle Diff
PRO

06 93 ________ X Torque Angle
_________ Y Torque Angle
_________ Z Torque Angle
V34E
SUR-3
POOE

FUEL VENT CLOSE (20-40 Psia ~ 6 Min.)

V40 N20E

*544 R _________ X Gyro Coeff
*545 R _________ Y Gyro Coeff
*546 R _________ Z Gyro Coeff
If Gyro Drift Changes > 2.0°/hr, AGS Failed
*400 + 3E AGS/PGNS Align, Wait For MSFN
*400 + 4E Lunar Align

Notify MSFN of Approx Landing Site
Install Window Shades

103:18
PDI+42
TIG-1:10

If Star(s) In L, F, or R AOT Detent, Position RR Antenna
Along (0°, 283°) Via V41N72
(9 min Thermal Constraint)
If Star In Rear Detent, No Redesignation Req'd,
Begin P57
CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 Sec
PGNS: RNDZ RDR - Close
AC BUS B: AOT LAMP - Close

RR MODE - LGC

V41 N72E
21 73 +00000 TRUN
+28300 SHFT
04 12 00006
00002

PRO
CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

P57E
04 06 00001
00003 REFSMMAT

PRO
05 06 00010
00002 2 Stars
00110

PRO

06 22 ICDU Angles (If Torquing Angles > 5°)
PRO

NO ATT Lt - On Then Off

01 70 OOCDE Detent, 1st Star
Load Desired Star Code
PRO

06 79 ________ Cursor
_________ Spiral
_________ Detent Position
PRO

01 71 OOCDE Detent, 1st Star
PRO

Read Cursor Angle ________
54 71 MARK X OR Y
Read Spiral Angle ________

06 79 ______ Cursor, ______ Spiral, ______ ______
Load Cursor & Spiral Angles ______ ______
V32E Remark Star
PRO After 2 Recycles

01 70 OOCDE Detent, 2nd Star
Load Desired Star Code
PRO

06 79 ________ Cursor
_________ Spiral
_________ Detent Position
PRO

01 71 OOCDE Detent, 2nd Star
PRO

Read Cursor Angle ________
54 71 MARK X OR Y
Read Spiral Angle ________
06 79 Cursor, Spiral, Load Cursor & Spiral Angles V32E Remark Star
PRO After 2 Recycles

If RR Antenna Along 0°, 283°,
Position RR Along +X Axis
CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close

V41 N72E
21 73 +18000 TRUN
+27000 SHFT

04 12 00006

PRO

040002

CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

06 05 Angle Diff

PRO

06 93 X Torque Angle

Y Torque Angle

Z Torque Angle

PRO (Monitor Gyro Torquing)

50 25 00014
ENTR

06 89 Lat

Long/2

Alt

Consult MSFN To Determine
Acceptance Of Position
(Accept) PRO
(Reject) V34E

POOE
Stow Window Shades And Photograph Surface
.6 FRAMES FAR FIELD (FOCUS 50') AND
.6 FRAMES NEAR FIELD (FOCUS 20')
WITH EACH CAMERA

REMOVE MAGS AND STOW

INSTALL 60MM PROTECTIVE COVER
AND STOW BOTH CAMERAS
*400 + 3E AGS/PGNS Align
*413 + 1E Store Azimuth

*047 R _________ Sin Az Comp
*053 R _________ Cos Az Comp

Transmit NO4, NO5, N93, Address 047, And 053 To MSFN

103:38
PDI+1:02
TIG-50

UP DATA LINK - DATA
MSFN Updates RLS & CSM
State Vectors (UPLINK ACTY
Lt - On Then OFF)

Copy Ascent Pad For
Simulated Countdown
SUR-8

*047  E Sin Az Comp
*053  E Cos Az Comp
*225  +58598  E oLower Limit
*226  +58598  E oUpper Limit
*231  E RLS
*465  +00320  E Ins H Dot

Install Window Shades

103:43
PD1+1:07

TIG-45

If Star In L,F, or R AOT Detent,
Position RR Antenna Along
(0°,283°) Via V41N72
(9 min Thermal Constraint)
If Star In Rear Detent,
No Redesignation Req'd
Begin P57
CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close
V41 N72E

21 73  +00000  TRUN
       +28300  SHFT

04 12  00006
       00002

PRO

CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

P57E

04 06  00001
       00004  Landing Site

PRO

06 34  T Align.
Load Simulated Countdown TIG
PRO

05 06  00010
       00003  Gravity & Star
       00110

PRO

June 16, 1969
July 7 REV "P"

LM-5

Basic Date
Changed
V16 N20E
Monitor Gravity Measurement
NO ATT Lt - On Then Off, Twice

+04200
+31800
+03500

KEY REL
06 04 + _______ Gravity Err Angle
PRO

If Gyro Torquing Angles > 5°:
06 22 ICDU Angles
PRO
NO ATT Lt - On Then Off

01 70 OOCDE Detent, Star
Load Desired Star
PRO

06 79 _______ Cursor
_________ Spiral
_________ Detent Position
PRO

01 71 OOCDE Detent, Star
PRO

Read Cursor Angle ________
54 71 MARK X OR Y
Read Spiral Angle ________

06 79 _____ Cursor, _____ Spiral ______
Load Cursor & Spiral Angles ______
V32E Remark Star
PRO After 2 Recycles

If RR Antenna Along 0°, 283°,
Position RR Along +X Axis
CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PCNS: RNDZ RDR - Close
V41 N72E
21 73 +18000 TRN
+27000 SHFT

04 12 00006
00002

PRO
CB(11) PGN5: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

06 05 __________ Angle Diff
PRO

06 93 __________ X Torque Angle
_________ Y Torque Angle
_________ Z Torque Angle
PRO (Monitor Gyro Torquing)

50 25 00014
PRO For Alignment Check
GET __:__:__
PDI + __________

01 70 00CDE Detent, Star
Load Desired Star
PRO

06 79 __________ Cursor
_________ Spiral
_________ Detent Position
Verify Detent & Star Position
V34E

CB(11) AC BUS B: AOT LAMP - Open
AOT - CL/0.0°

POOE

104:07
PDI+1:12
TIG-35

Don Helmets & Gloves
V48E
01 46 12012 DAP Config
PRO

06 47 LM Wt
CSM Wt
PRO

GUID CONT - PGNS
MODE CONTROL (PGNS) - AUTO
V77E

P12E
06 33 TIG ASC
(104:42:05.5)
PRO

06 76 VH Final
H Dot Final
Xrng
PRO

06 74 TFI
Yaw
Pitch
ET - Set/Up

*547 R + 0 Lunar Align Az
 Corrections
*623 + 0E +Z Along CSM Plane

104:12
TIC-30

*400 + 4E Lunar Align

Configure CB's Per Chart
X POINTER SCALE (2) - HI MULT
RATE/ERR MON (2) - LDG RDR/CMPTR
ATT MON (CDR) - PGNS
GUID CONT - PGNS
MODE SEL - AGS
RNG/ALT MON - ALT/ALT RT
RATE SCALE - 25°/SEC
ACA PROP (2) - ENABLE
ENG ARM - OFF
ATT/TRANSL - 4 JETS
BAL CPL - ON
ASC He REG 1&2 tb (2) - gray
ABORT - Reset
ABORT STAGE - Reset
ENGINE STOP (2) - Reset
PRPLNT TEMP/PRESS - ASC
HELUM MON - ASC PRESS 1
SYS A&B QUAD 1, 2, 3, 4 (8) tb - gray
SYS A&B ASC FEED tb (4) - bp
SYS A&B MAIN SOV tb (2) - gray
CRSFD - tb-bp
TEMP/PRESS MON - OXID MANF
GLYCOL - PUMP 1
SUIT FAN - 1
O2/H2O QTY MON - ASC 1
ATTITUDE MON (LMP) - AGS
RADAR TEST - OFF
RR MODE - LGC
DEAD BAND - MIN
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL (Both) - AUTO
TEMP MONITOR - RNDZ RDR
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
ACA/4 JET (CDR) - ENABLE
ACA/4 JET (2) - ENABLE (LMP) DISABLE
TTCA/TRANSL (2) - ENABLE DISABLE
TTCA (Both) - JETS

MASTER ARM - OFF
STAGE - SAFE/Guarded

DES H2O - CLOSE
WATER TANK SEL - ASC
ASC H2O - OPEN
DES 02 - CLOSE
ASC 02 No. 1 - OPEN
CABIN REPRESS - CLOSE
SUIT GAS DIVERTER - Pull/EGRESS
CABIN GAS RETURN - AUTO
SUIT CIRCUIT RELIEF - AUTO
PRESS REG A&B - EGRESS
Launch Guidance System
Recommendation From MSFN

Extended STAY From MSFN

- ASC He REG 1&2 - tb(2)-gray
- MASTER ARM - ON
- ASC He SEL - BOTH
- ASC He PRESS - FIRE
- MASTER ARM - OFF
- SYS A FEED 2-OPEN
  - tb(2)-gray
- Monitor Sys A Manf Press
- SYS A MAIN SOV-CLOSE
  - tb-bp
- CRSFD-OPEN, tb-gray
- SYS B ASC FEED 2-OPEN
  - tb(2)-gray
- Monitor Sys B Manf Press
- SYS B MAIN SOV-CLOSE
  - tb-bp
- BAT 5,6 - ON
- BAT 1,3 - OFF/RESET
  - tb-bp
- CB(11)EPS: ASC ECA CONT-CLOSE
- CB(16)EPS: ASC ECA CONT-CLOSE

VHF A: XMTR - VOICE/RNG
  - RCVR - ON
VHF B: XMTR - OFF
  - RCVR - ON

AUDIO (Both) VHF A - T/R
  - VHF B - RCV

V47E
06 16 _______ PGNS/AGS Bias

*414 +1E
PRO
*414R +0 Complete
50 16 Update Complete
PRO
104:25
TIG-17
CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close

104:32
TIG-10
Check APS, RCS, ECS, & EPS

104:37
TIG-5

BAT 2,4 - OFF/RESET, tb-bp
DES BATS - DEADFACE, tb-bp
If bp
CB(11) EPS: DES ECA-OPEN
: DES ECA CONT-OPEN
CB(16) EPS: DES ECA-OPEN
: DES ECA CONT-OPEN
Check APS START Card

TIG-2
*400 + 1E Guid Steering

1st REV ABORT
TIG-1: MASTER ARM - ON
*500R
V77E
TIG-35: DSKY BLANKS
TIG-30: 06 74 TFI
_________ YAW
_________ PITCH
TIG-05: ABORT STAGE-PUSH
ENG ARM-ASC
PRO

END SIMULATED COUNTDOWN
V37E
POOE
Doff Helmets & Gloves

POWERDOWN

ASC 02 No. 1 - CLOSE
DES 02 - OPEN
CABIN REPRESS - AUTO
WATER TANK SEL - DES
ASC H2O - CLOSE
DES H2O - OPEN
02/H2O QTY MON - DES

CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
HEATERS: RNDZ RDR OPR - Open

ET - STOP

CB(16) STAB/CONT: AEA - Open
AGS STATUS - STBY
CB(16) STAB CONT: AEA - Close
VHF A&B XMTR & RCVR - OFF
AUDIO (Both): VHF A&B - OFF

Configure CB's Per Chart
FDAI 162 - INRTL
EARTH/LUNAR - PWR OFF
LTG - OFF
MODE - HOLD/FAST
ALT SET - 45

FUEL & OXID VENT tb-bp
MASTER ARM - OFF
DES VENT - SAFE
ASC He SEL - BOTH
STAGE - SAFE (guarded)

S BAND T/R - S BAND T/R
ICS T/R - ICS T/R
RELAY ON - RELAY OFF
MODE - ICS/PTT
AUDIO CONT - NORM
VHF A - OFF
VHF B - OFF
COAS - OFF

TTCA (CDR) - JETS (Dn)
Eng STOP - Reset (guarded)
Eng START - Reset

TMR CONT - START
OVERRIDE ANUN - OFF
OVERRIDE NUM - OFF
OVERRIDE INTEGRAL - OFF
SIDE PANELS - Crew Opt
FLOOD OVHD/FWD - Crew Opt
ANUN/NUM - Crew Opt
INTEGRAL - Crew Opt

X POINTER SCALE - HI MULT
RATE/ERR MON - LDG RDR/CMRTR
ATTITUDE MON (CDR) - PGNS
GUID CONT - PGNS
MODE SEL - PGNS
RNG/ALT MON - RNG/RNG RT
SHFT/TRUN - ±50°
RATE SCALE - 25°/SEC
THR CONT - AUTO
MAN THROT - CDR
ENG ARM - OFF
ATT/TRANS - 4 JETS
BAL CPL - ON
PRPLNT QTY MON - OFF
PRPLNT TEMP/PRESS MON - ASC
HELIUM MON - PRESS 1
ABORT - Reset
ABORT STAGE - Reset (Guarded)

TEMP/PRESS MON - OXID MANF
ACA PROP - DISABLE
RATE/ERR MON - LDG RDR/CMPT
ATTITUDE MON (IMP) - AGS
GLYCOL - PUMP 1
SUIT FAN - 1
O2/H2O OTY MON - DES

DES ENG CMD OVRD - OFF
TEST - OFF
TEST MON - AGC
SLEW RATE - HI
RR MODE - LGC
DEAD BAND - MIN

ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL (PGNS) - ATT HOLD
MODE CONTROL (AGS) - AUTO
IMU CAGE - OFF
EVENT TIMER - UP And STOP
TEMP MON - RNDZ RDR
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
SIDE PANELS - Crew Opt
FLOOD - Crew Opt
OVHD/FWD - Crew Opt
EXTERIOR LTG - OFF
X POINTER SCALE - HI MULT

ACA/4 JET (2) - DISABLE
TTCA/TRANS - 2 (2) - DISABLE
AOT - CL
RR GYRO SEL - PRIM

TTCA (LMP) - JETS (Dn)

Eng STOP - Reset
AGS STATUS - STBY
POWER/TEMP MON - CDR BUS
INVERTER - 2
UP LINK SQUELCH - ENABLE OFF
UP DATA LINK - OFF

AUDIO CONT - NORM
S BAND T/R - S BAND T/R
ICS T/R - ICS T/R
RELAY ON - RELAY OFF
MODE - ICS/PTT
VHF A&B - OFF

S BAND MODULATE - PM
XMTR/RCVR - PRIM
PWR AMPL - PRIM
VOICE - VOICE

PCM - PCM
RANGE - CWEA ENABLE
VHF A XMTR & RCVR (2) - OFF
VHF B XMTR & RCVR (2) - OFF
TLM BIOMED - As Required
TLM PCM - HI
RECORER - As Desired
VHF - AFT TRACK MODE - SLEW
Peak SIG STR Meter
PITCH
YAW
S BAND - SLEW

PRESS REG A&B - CABIN
SUIT GAS DIVERTER - PUSH CABIN
CABIN REPRESS - AUTO
PLSS FILL - CLOSE
DES 02 - OPEN
#1,#2 ASC 02 - CLOSE
SUIT ISOL (Both) - SUIT FLOW
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - AUTO
C02 CANISTER SEL - PRIM
PRIM & SEC C02 CANISTER - CLOSE
WATER SEP SEL - PUSH SEP 1
ASC H2O - CLOSE
SEC EVAP FLOW - CLOSE
PRIM EVAP FLOW NO. 2 - CLOSE
DES H2O - OPEN
PRIM EVAP FLOW NO. 1 - OPEN
WATER TANK SELECT - DES
SUIT TEMP - As Required
LIQUID GARMENT COOLING - As Required

CABIN RELIEF & DUMP (Both) - AUTO
UTILITY LIGHTS (Both) - As Desired

OVHD FLOODS - As Desired

CWEA Status:

Caution  Warning
PREAMPS  CES AC (Reset via GYRO TEST Sw)
          CES DC (Reset via GYRO TEST Sw)
          ASC PRESS

EAT & REST PERIOD  104:50 To 109:30

Crew Awake - Confirm No Change in CWEA Status

EAT PERIOD  109:30 To 110:30

Change Prim LiOH Cartridge
Stay/No Stay For EVA Prep
Crew Status Report To MSFN (Sleep, Dosimeter)
CREW STATUS

BTH
- UCTA empty
- Helmets stowed
- Gloves stowed
- PGA flow diverter valves - horizontal
- LM O₂, COMM, AND H₂O hose connected to PGA
- Inspect PGA Zipper-Verify lock-lock

SYSTEMS PREPARATION FOR EGRESS

BTH
- Adjust interior lgt to desired level
- Enable DSEA as required
- Unstow One Man Transition card and clip to
  AOT guard (page, SUR-36)
- Unstow and tape Final EVA Configuration Cards
  (pages SUR-34 and 35)

PREPARATION FOR EGRESS

BTH
- Clear PGA pockets (Ball point & marker pens)
- Stow adjustable pockets
- Stow loose items not require for EVA
- Stow RH armrest
BTH
- Remove CDR's LH and LMP's RH and LH
  Armrest and stow on mid-section step
- LM restraints stowed for SSC access

CDR
- Transfer coas to fwd window mount

LMP
- Stow DEDA desk
- Verify bacteria filter installed on FWD
  hatch dump valve
- Remove 16mm data acquisition camera from
  bracket over window
- Verify cable to camera connection, fresh
  magazine installed, 10mm lens installed,
  and adjust settings: per 16mm mag decal

CDR
- Remove Hang-down and EVA card no.1 from
  flight data file and temp stow
Remove clamp and brackets from utility lights, stow on AOT guard, and secure utility lights and cords to AOT guard

Unstow Rt. angle bkt from LHSSC & attach to one clamp and bracket

Unstow RCU camera brkts (2) from lower overshoe comp and place on engine cover

Install 16mm camera on univ brkt
Mount 16mm camera on mirror mount (Temp stow as desired)
Route cable around brkts to remove slack
Camera seq C/B - close
Verify camera operation
Mount Rt. angle/univ bkt on crash bar
Remove 2 16mm mags/stow in ISA botm pocket
Remove 60mm Hasselblad & Fresh HCEX mag fm RHSSC
(Stow drk slide & prot cvr in LHSSC) & hnd to CDR

Assemble camera-attach RCU camera brkt.
Remv EVA cam hndl fm RHSSC & hand to CDR
Attach hndl to HBLAD-Adjust settings: per mag decal
Take phot-ver cam ops & place on engine cover
(Cam fail - try manual
Ass 80mm HBLAD with HCEX mag-attach RCU camera bkt
Adjust settings: per mag decal
Take phot-ver cam ops & rstw in RHSSC
Unstow LEC/TTHR pkg fm RHSSC - remv LEC,
waist TTHR, & 2 hks - restw LEC/TTHR pkg
Att hooks to tiedown
Att LEC pulley to PLSS upr donng sta pin & hks
to 60mm HBLAD
Stw HBLAD in ISA top pkt & LEC
bag above flite data file
Att waist tether to 80mm HBLAD
Unstow YO YO from feedwater compt bag and stow in ISA mid pkt
Position mirror as desired
Secure util lt & cable for PLSS/OPS donning
BTH  Remove PLSS fm floor, stow floor mounts and position PLSS against forward hatch
Transfer helmet stowage bags to cabin floor

CDR  Transfer to AFT cabin area
Remv top OPS & adap fm SRC rk & hand to LMP
Remove 2nd OPS and adapter from SRC rack

BTH  Remv OPS fm brkts & temp stow brackets
Verify OPS 02 press 5880±500 psia & 02 hose nozzle locked
Open OPS 02 Shut off valve and verify 02 flow and regulation 3.70±0.30 psig
Press heatr tst butt — Note lites on
Close OPS 02 shut-off valve
Unstw OPS antenna lead-snap thermal covers
Stow OPS on cabin floor

CDR  Stow brackets with armrests in SRC rack
Grasp EVA antenna "T" handle, pull down and rotate handle to detent, release handle
Remove both RCU's from housing and pass to LMP for stowage on LHSSC
Unstow top pair of lunar overshoes from L.H. mid-sect & hand to LMP (leave door open)
Restow helmets in RCU stowage area

LMP  Remove purge valve & stow in ISA middle pocket

CDR  Don lunar overshoes with LMP's assistance
Unstw 2nd pair overshoes fm LH mid-sect
Remove purge valve-stow in ISA middle pocket

LMP  Don lunar overshoes with CDR's assistance
Remv spent 'ECS cann & brkt-stow at crew station

BTH  Remove LEVA's and EV gloves from helmet bags and stow aft of engine
Attach chronometers to RH EV glove

CDR  Remove anti-fog fm main kit and stow
Stow helmet bags in top lunar overshoes comp
Unstw CSRC fm LHSSC & stow in PCA leg pkt

BTH  Remove and stow PGA plugs in purse
Move PLSS im floor to engine cover
Route LM umbilicals behind PGA
Attach OPS to top of PLSS - lock
Hold PLSS/OPS for donning prep
Remove cover from EVCS antenna connector
Connect OPS antenna lead to EVCS and lock
Verify sublimator exhausts are clear
Unstow upper and lower PLSS donning straps
Unstow PLSS elec umb O2 & H2O hoses
Unstow battery cable
Xfer batt prot cover to cable stowage cnctr
Connect battery cable to battery
Remove PLSS RCU cnctr cover & stow in LHSSC
Verify OPS reg checkout gage reads < 2.5 psi
Unstow OPS O2 hose nozzle
Secure PLSS thermal cover
Remv YO YO fm ISA Mid1 pkt & attach to lwr
RH PLSS strap
Turn right and back into PLSS
Don PLSS/OPS by securing PLSS upper and
lower straps to PGA
Connect PLSS O2 hoses - lock
Unstow RCU

WARNING
Before connecting RCU to
PLSS all elec PLSS cont
must be in off position

Pump - off
Fan - off
Mode sel sw - 0 (off)
Connect RCU electrical to PLSS
Attach RCU to PLSS straps and PGA - lock
Verify these PLSS switch & valve positions
Diverter vlv - min (up)
O2 shutoff valve - off (up)
Feedwater valve - closed (up)
Pump - off
Fan - off
Mode sel sw - 0 (off)
Remv PLSS fm rechrg sta & put on cab flr
Secure ISA
Transfer helmets to recharge station
Place PLSS on engine cover
Route LM umbilicals in front of PGA
Attach OPS to top of PLSS - lock
Hold PLSS/OPS for donning prep
Remove cover from EVCS antenna connector
Connect OPS antenna lead to EVCS and lock
Verify sublimator exhausts are clear
Unstow upper and lower PLSS donning straps
Unstow PLSS elec umb O2 & H2O hoses
Unstow battery cable
Xfer batt prot cover to cable stowage cnctr
Connect battery cable to battery
Remov PLSS RCU cnctr cover and stow in LHSSC
Ver OPS reg checkout gage reads <2.5 psi
Unstow OPS O2 hose nozzle
Secure PLSS thermal cover
Turn left and back into PLSS
Don PLSS/OPS by securing PLSS upper and
lower straps to PGA
Unstow RCU, hold, and turn right to face LMP
Connect PLSS O2 hoses - lock

**WARNING**
Before connecting RCU to PLSS,
all elec PLSS cont must be in
off position

- Pump - off
- Fan - off
- Mode sel sw - 0 (off)

Connect RCU electrical to PLSS
Attach RCU to PLSS straps and PGA - lock
Verify these PLSS sw and valve positions
- Diverter vlv - min (up)
- O2 shutoff vlv - off (up)
- Feedwater vlv - closed (up)
- Pump - off
- Fan - off
- Mode sel sw - 0 (off)
PLSS/EVCS ELECTRICAL CHECKOUT

LMP
Comm panel -
  S-band Modulate - FM
TV C/B - Close
Verify voice comm with MSFN
LMP Audio panel -
  S-band - T/R
  ICS - T/R
  Relay - on
  Mode - VOX
  VOX sens - max increase
  VHF A - T/R
  VHF B - RCV

CDR
CDR audio panel -
  S-band - T/R
  ICS - T/R
  Relay - off
  Mode - VOX
  VOX sens - max increase
  VHF A - T/R
  VHF B - RCV

LMP
Verify LM EVA antenna deployed
VHF ANT SEL sw - EVA
Comm panel -
  VHF A XMTR - voice
  VHF A RCVR - on
  VHF B XMTR - off
  VHF B RCVR - on
  Squelch A-noise threshold + 1 1/2 div
  Squelch B-noise threshold + 1 1/2 div
  Recorder on
Biomed sw - off
SE audio C/B - open
Disconnect LM comm cable from PGA and secure
Connect PLSSS electrical umbilical to PGA
SE audio C/B - close
**LMP**

RCU PTT - MAIN
PLSS mode sel sw - A
Verify -
   PLSS warning tone - on (10 sec)
   RCU press window - 0 (OPS act-abort)
   RCU vent window - P (purge-abort)
Verify PLSS 02 bottle press >85%
Verify voice comm with CDR

**NOTE**
Unstow antenna of PLSS
which transmits Garbled
and/or loses TM.

NO MSFN Reception when PLSS mode sel in POS B

**CDR**

Audio C/B - open
Disc LM comm cable fm PGA and secure
Connect PLSS electrical umbilical to PGA
CDR audio C/B - close
CDR audio panel -
   VHF A - off
   VHF B - off
RCU PTT-MAIN
PLSS mode sel sw - B
Verify -
   PLSS warning tone - on (10 sec)
   RCU press window - 0 (OPS act-abort)
   RCU vent window - P (purge-abort)
Verify PLSS 02 bottle press >85%
Verify voice comm with LMP

**LMP**

PLSS mode sel sw - B
PLSS warning tone - on (10 sec)

**CDR**

PLSS mode sel sw - A
PLSS warning tone - on (10 sec)
Verify voice with LMP
BTH  PLSS mode sel sw - AR
   PLSS warning tone - on (10 sec)
   Verify PLSS 02 bottle press > 85%
   Verify voice with each other
   Verify voice and TM comm with MSFN

NOTE
If comm with MSFN is "NO GO" -
S-band Modulate - PM
Verify voice & TM comm with MSFN

LMP  TV C/B - open

FINAL EVA EQUIPMENT PREP FOR EGRESS

BTH  Unstow OPS 02 hose and OPS 02 actuator
   Attach 02 actuator to RCU
   Snap OPS 02 hose to side of PLSS with
   RCU connector flap

FINAL SYSTEMS PREP FOR EGRESS

BTH  Confirm "GO" for cabin depress with MSFN
LMP  Verify Cabin fan cont C/B - open
     Verify cabin repress C/B - close
     Suit fan Delta-P C/B - open
     Des H2O vlv - close
CDR  Verify Cabin fan 1 C/B - open
     Suit fan 1 C/B - open
     Verify suit ckt relief vlv - auto
     Suit gas div vlv - egress (pull)
     Cabin gas return vlv - egress
     Verify master alarm - master alarm pb - Lt - Reset
     Verify ECS caut lt & H2O sep comp caut lt on
PREP FOR CABIN DEPRESS

CDR: Both suit isol vlv - suit disc
    Disconnect LM 02 hoses
    Connect OPS 02 hose to RH PGA blue connector-lock
    Retrv purg vlv from mid ISA pkt - verify clrs & lk’d pin
    Instl-instl in RH PGA red cnctr - lock
    PGA flow diverter valves - vertical
    Unstow helmet
    Verify feed port cover installed and locked
    Apply anti-fog to helmet
    Position mikes
    Verify PLSS mode sel sw - AR

LMP: PLSS fan - on

CDR: Place LMP's helmet on LMP, and "LOCK"

LMP: Verify - RCU vent window - clears

CDR: Remove LEVA from engine cover, verify
    EV visor up, and attach to LMP's helmet

BTH: Verify helmet/neck ring align

CDR: PLSS fan - on

LMP: Place CDR's helmet on CDR, and "LOCK"

CDR: Verify - RCU vent window - clears

LMP: Remove LEVA from engine cover, verify
    EV visor up, and attach to CDR's helmet

BTH: Verify helmet/neck ring align

CDR: Unstow cue cards: Hang-down, Final EVA
    Configuration, & EVA Card No. 1
    Attach Hang-down to upper hatch

LMP: Attach EVA Card No.1 overhead

BTH: Position Final EVA Configuration Cards as desired

CDR: Stow Lunar Surface Checklist in purse
**FINAL EVA CONFIGURATION**

*CLOSED FOR 1 MAN EVA*

Basic Date

Changed
FINAL EVA CONFIGURATION

CLOSE TV AFTER CDR EGRESS

*CLOSED FOR 1 MAN EVA

Basic Date
Changed
TRANSITION TO ONE MAN EVA

BTH VERIFY/PERFORM-AS REQ'D AT TIME OF "NO GO"
PLSS FEEDWATER VLV-CLOSE (UP)
FWD HATCH CLOSED
REPRESS CABIN (USE HANG-DOWN CUE CARD)
PLSS O₂ SHUTOFF VLV-OFF
SUIT FAN 1 C/B-CLOSE
SUIT FAN DELTA-P C/B-CLOSE
ECS CAUT LT & H₂O SEP COMP CAUT LT-OFF
PGA PRESS EQUAL TO CABIN (USE PURGE VLV, IF REQ'D)
DOFF GLOVES AND HELMETS WITH EV VISORS
PLSS PUMP-OFF
PLSS FAN-OFF

NO GO CREWMAN
PLSS MODE SEL SW-O (OFF)
DISCONNECT-OPS O₂ HOSE
- PURGE VLV-STOW IN ISA MID PKT
- OPS ACTUATOR FROM RCU
- RCU FROM PGA AND PLSS
- PLSS COMM, H₂O, AND O₂

DOFF PLSS/OPS
AUDIO C/B - OPEN
BIOMED SW - OFF
CONNECT LM COMM, O₂, AND H₂O
AUDIO C/B - CLOSE
COMM SWS - AS REQ'D

OTHER CREWMAN
DISCONNECT PLSS H₂O
CONNECT LM H₂O
LCG PUMP C/B - CLOSE

BTH REVIEW ONE MAN PROCEDURES TO TIME OF "TWO MAN
NO GO" AND PROCEED
### ONE MAN EVA

**CREW STATUS** - Perform Planned  
**SYSTEMS PREP FOR EGRESS** - Perform Planned  
**PREP FOR EGRESS** - Perform Planned  
**PLSS/OPS DONNING** - Perform following:

<table>
<thead>
<tr>
<th>VERIFY/PERFORM</th>
<th>EVA CREWMAN</th>
<th>NON EVA CREWMAN</th>
</tr>
</thead>
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<tr>
<td>1 Crew Stations</td>
<td>At CDR's</td>
<td>At LMP's</td>
</tr>
<tr>
<td>2 EVA Hook</td>
<td>Don</td>
<td>* LHSSC</td>
</tr>
<tr>
<td>3 OPS (Perform Checkout)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPS NO GO FOR EVT</td>
<td>N/A</td>
<td>Engine</td>
</tr>
<tr>
<td>Other</td>
<td>Cabin Floor</td>
<td>SRC Rack</td>
</tr>
<tr>
<td>4 Armrests (3)</td>
<td>In OPS BRACKETS, SRC Rack</td>
<td></td>
</tr>
<tr>
<td>5 OPS Brackets</td>
<td>SRC Rack</td>
<td></td>
</tr>
<tr>
<td>6 LM EVA Antenna</td>
<td>Deploy</td>
<td></td>
</tr>
<tr>
<td>7 RCU–RCU NO GO FOR EVT</td>
<td>N/A</td>
<td>ON LHSSC</td>
</tr>
<tr>
<td>Other</td>
<td>ON LHSSC</td>
<td>RCU Comp</td>
</tr>
<tr>
<td>8 Helms</td>
<td>Over RCU Stowage</td>
<td>HSB</td>
</tr>
<tr>
<td>9 Purge Valves</td>
<td>ISA Mid Pkt</td>
<td>* LHSSC</td>
</tr>
<tr>
<td>10 Lunar Boots</td>
<td>Don</td>
<td>Cabin Flr</td>
</tr>
<tr>
<td>11 ECS Cannister and Bkt</td>
<td></td>
<td>* HSB</td>
</tr>
<tr>
<td>12 LEVA</td>
<td>Engine Cover</td>
<td>Engine Cvr</td>
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<tr>
<td>13 EV Gloves</td>
<td>Engine Cover</td>
<td>RH EV Glove</td>
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<tr>
<td>14 Chronometer</td>
<td>RH EV Glove</td>
<td></td>
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<tr>
<td>15 Anti-Fog</td>
<td>Temp Stow</td>
<td></td>
</tr>
<tr>
<td>16 HSB</td>
<td>Top Lunar Boot Compt</td>
<td>Engine Cvr</td>
</tr>
<tr>
<td>17 CSRC</td>
<td>PGA Leg Pkt</td>
<td>N/A</td>
</tr>
<tr>
<td>18 PGA Connec Plugs</td>
<td>Purse</td>
<td>LH PGA</td>
</tr>
<tr>
<td>19 PLSS Straps (lower)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLSS NO GO FOR EVT</td>
<td>N/A</td>
<td>ISA Mid</td>
</tr>
<tr>
<td>Other</td>
<td>On PLSS–Exchange</td>
<td>On PLSS</td>
</tr>
<tr>
<td></td>
<td>If Req'd</td>
<td></td>
</tr>
<tr>
<td>20 PLSS–PLSS NO GO FOR EVT</td>
<td>N/A</td>
<td>Rechg Sta</td>
</tr>
<tr>
<td>Other</td>
<td>Cabin Floor</td>
<td>Rechg Sta</td>
</tr>
<tr>
<td>21 ISA</td>
<td>Secured</td>
<td></td>
</tr>
</tbody>
</table>
22 PLSS/OPS PREP For DONNING -  
OPS ANT Lead - UNSTOWED  
OPS Attached to PLSS - LOCKED  
OPS ANT Lead to PLSS - LOCKED  
Sub Exhaust - CLEAR  
Donning Straps, ELEC, O2 and 20 UMB - UNSTOWED  
Battery - CONNECTED  
RCU Connec Cover - In LHSSC  
OPS Checkout Gage <2.5 psig  
OPS O2 Hose Nozzle - UNSTOWED

23 PLSS/OPS DONNING - PLSS/OPS Donned - Straps Connected (4)  
PLSS O2 to PGA LH connect - LOCKED  
RCU (All Elec CNTLS-OFF) to PLSS,  
PGA and PLSS Straps - lock  
Diverter VLV - MIN (up)  
O2 Shutoff VLV - OFF (up)  
Feedwater - Closed (up)  
Pump - OFF  
Fan - OFF  
MODE SEL sw - 0 (OFF)

PLSS/EVCS ELECTRICAL CHECKOUT  
Set Comm panel -  
S-band Modulate - FM  
TV C/B - Close  
Verify voice comm with MSFN

Non EVA Crewman Audio Panel -  
S-band - T/R  
ICS - T/R  
Relay - off  
Mode - VOX  
VOX sens - max increase  
VHF A - RCV  
VHF B - T/R

EVA Crewman audio panel -  
S-band - T/R  
ICS - T/R  
Relay - on  
Mode - VOX  
VOX sens - max increase  
VHF A - RCV  
VHF B - T/R
Verify LM EVA antenna deployed
Set VHF ANT SEL sw – EVA

Set comm panel –
VHF A XMTR – off
VHF A RCVR – on
VHF B XMTR – voice
VHF B RCVR – on
Squelch A – noise threshold +1 1/2 div
Squelch B – noise threshold +1 1/2 div

Recorder – on
Biomed sw – Non EVA Crewman

EVA Crewman Audio C/B – open

Disconnect LM comm – connect PLSS comm to PGA

EVA Crewman Audio C/B – close
RCU PTT–MAIN
PLSS mode sel sw – B

Verify –
PLSS warning tone – on (10 sec)
RCU press window – 0 (OPS act – abort)
RCU vent window – P (PURGE – ABORT)
Verify PLSS O2 bottle press>85%
Voice comm with other crewman and MSFN

NOTE
Unstow antenna if PLSS
transmits Garbled and/or
loses TM.

Non EVA Crewman Audio panel –
VHF A – T/R
VHF B – RCV

EVA Crewman Audio panel –
VHF A – T/R
VHF B – RCV

Set comm panel –
VHF A XMTR – voice
VHF B XMTR – off
PLSS mode sel sw - A

Verify -
  PLSS warning tone - on (10 sec)
  PLSS 02 bottle press > 85%
  Voice with other crewman
  Voice and TM comm with MSFN

NOTE
  IF COMM with MSFN
  is NO GO -
    S-band Modulate - PM
    Verify voice and TM
    with MSFN

Non EVA Crewman
TV C/B - open

FINAL EVA EQUIPMENT PREP FOR EGRESS

Unstow OPS 02 Hose and Actuator

Attach 02 Actuator to RCU

Snap OPS 02 Hose to side of PLSS with
  RCU connector flap

FINAL SYSTEMS PREP FOR EGRESS

Confirm "GO" for cabin depress with MSFN

Verify Cabin fan 1 C/B - open

Verify Cabin fan cont C/B - open

Verify - cabin repress C/B - close

Des H2O vlv - close

Verify - suit ckt relief vlv - auto

Suit gas div vlv - egress (pull)

Cabin gas return vlv - egress
PREP FOR CABIN DEPRESS

**CREWMAN (Other Crewmen Assist)**

- Suit isol vlv - suit disc
- Disconnect LM O2 hoses
- Connect OPS O2 hose to RH PGA blue conn-lock
- Get purge vlv from ISA mid pkt - verify closed & lkd pin instl
- Install in RH PGA red conn - lock
- PGA flow diverter vlv - vertical
- Verify helmet feed port cover installed and locked
- Apply anti-fog to helmet
- Position mikes
- Verify PLSS mode sel sw - A
- PLSS fan - on
- Don helmet and "lock"
- Verify - RCU vent window - Clears
- Attach LEVA to helmet
- Verify helmet/neck ring align
- Don EV gloves and "lock"

**Non EVA CREWMEN**

- Verify helmet feed port cover installed and locked
- Apply anti-fog
- Position mikes
- Don Helmet and "lock"
- Verify helmet/neck ring align
- Unstow Cue Cards: Hang-down, Final EVA Configuration & EVA Card No. 1
- Attach Hang-down to upper hatch
- Position Final EVA Configuration Card as desired
- Stow Lunar surface checklist in purse
POST EVA Hardsuit Checklist Complete

Verify CB Status Per Chart
AUDIO (CDR): S-BAND T/R - T/R
VHF A - OFF
VHF B - OFF

AUDIO (LMP): S-BAND T/R - T/R
VHF A - OFF
VHF B - OFF

S-BAND: PM, PRIM, PRIM, VOICE, PCM, CWEA ENABLE, LEFT, HI

VHF A XMTR & RCVR (2) - OFF
VHF B XMTR & RCVR (2) - OFF

Verify:
MASTER ARM - OFF
ENG ARM - OFF
ATTITUDE CONT (3) - MODE CONT
MODE CONT: PGNS - ATT HOLD
MODE CONT: AGS - AUTO

POWER TEMP MON - Check BAT, BUS Volts

EAT PERIOD
116:40 To 117:20

CB(11) HEATERS: RNDZ RDR OPR - Close
BIOMED - LEFT

REST PERIOD
117:20 To 122:00

121:53
TIG-2:30

CB(11) AC BUS B: AGS - Close
AGS STATUS - OPERATE

Configure CB's Per chart
POOE

V35E
88 88 All Eights
Master Alarm, LGC, ISS
Warning & DSKY Lts - On (5 sec)

RSET

V25 NO1E, 1365E
E,E,E

V15 NO1E, 1365E

V21 N27E, 10E

15 01 Test Successful When
R2 ≥ 3. (78 sec)

V21 N27E, 0E

*6666 OPR ERR Lt - On
*000 + 88888

*123 - 45679
*412+0E Reinitialize Self Test
*412 + 1 Satisfactory

*574R + Not Staged
*604R + On Surface
*612R + O ATT HOLD At
ABORT STAGE

UP DATA LINK - DATA
TELEMETRY PCM - HI

MSFN Uplinks CSM State Vector
(UPLINK ACTY Lt - On Then Off)

UPDATA LINK - OFF

V16 N65E LGC TIME
*377 +
*ENTR At Correct Time
V47E
06 16 : : : PGNS/AGS Bias
Load Bias Time
*414 + 1E
PRO
*414R + 0 Complete
50 16 Update Complete
PRO

122:03
TIG-2:20

If Star In L, F, or R AOT Detents,
Position RR Antenna Along (0°, 283°)
Via V41N72:
If Star In Rear Detent, No Redesignation
Req'd, Begin P57

CB(11) AC BUS A: RNDZ RDR - CLOSE
Wait 30 sec
PGNS: RNDZ RDR - Close
RR MODE - LGC

V41 N72E
21 73 +00000 TRUN
+28300 SHFT

04 12 00006
00002
PRO

CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

P57E
04 06 00001
00003
REFSMMAT 
PRO

05 06 000010
00003 Gravity & Star
00110
PRO
V16 N20E ICDU Angles
Monitor Gravity Measurement
NO ATT Lt - On Then Off, Twice

+ 04200
+ 31800
+ 03500

KEY REL

06 04 + Gravity Err Angle
PRO

06 22 ICDU Angles
PRO
NO ATT Lt - On Then Off
CB(11) AC BUS B: AOT LAMP-CLOSE

01 70 OOCDE Detent, Star
Load Desired Star
PRO

06 79 _______ Cursor
_______ Spiral
_______ Detent Position
PRO

01 71 OOCDE Detent, Star
PRO

Read Cursor Angle
54 71 MARK X OR Y
Read Spiral Angle

06 79 _______ Cursor, _______ Spiral
Load Cursor & Spiral Angles
V32E Remark Star
PRO After 2 Recycles

If RR Antenna Along (0º, 283º)
Slew RR Along +X Axis Via V41N72:

CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close
V41 N72 E
21 73 +18000 TRUN
+27000 SHFT

04 12 00006
00002
PRO

RR MODE - SLEW
V44E

06 05 __________ Angle Diff
PRO

06 93 __________ X Torque Angle
_________ Y Torque Angle
_________ Z Torque Angle
PRO (Monitor Gyro Torquing)

50 25 00014 (XX X Y Z)
V34E

POOE

X-POINTER SCALE (Both) - HI MULT
RATE/ERR MON (Both) - RNDZ RDR
ATTITUDE MON (Both) - PCNS
MODE SEL - AGS
RNG/ALT MON - RNG/RNG RT
SHFT/TRUN - ±50°

TEMP MONITOR - RNDZ (+10° to +145°)

RR MODE - AUTO TRACK

RADAR TEST - RNDZ (Rng Rt Tape Drives,
X-Pointers & FDAO Needles Vary
Between Limits. After 12 sec
Rng Tape Drives, NO TRACK - Out)

TEST/MONITOR - AGC 1.0 to 1.8 (1.8)
- XMTR PWR 2.1 to 4.1 (2.6)
- SHAFT ERR 2.1 to 2.6
- TRUN ERR 2.2 to 2.6
- AGC
V25 N07E
F21 07, 101E, 10E, 1E
RR MODE - LGC (NO TRACK Lt - On)

V63E
04 12 00094
00001 RR
PRO (NO TRACK Lt - Out
After 12 sec)

16 72 Varying @ 1/2 cps

16 78 +19548 To +19588 Rng (TM Within +1.2 of R1)
-00467 To -00507 Rng Rt (TM=2<R2)

V34E
RADAR TEST - OFF (NO TRACK
Lt - On, X-Pointers - Center)

V40N72E
*400 + 3E AGS/PGNS Align (1st of 2
more new points)

V77E
V15NO1E, 42E (Rate CMP Hot Fire Check ACA To Jets)

CB (11) RCS SYS A: QUAD TCA (4) - Close
CB (16) RCS SYS B: QUAD TCA (4) - Close

CDR ACA (OUT OF DETENT, PAUSE AT NULL)
ROLL Rt 000XX
Lt 777XX
PITCH Up 000XX
Dn 777XX
YAW Rt 777XX
Lt 000XX

CB (11) RCS SYS A: QUAD TCA (4) - Open
CB (16) RCS SYS B: QUAD TCA (4) - Open

V76E (MIN IMP Check of CDR ACA to LGC, ACA Cold
Fire CES Voltage, SEC RCS Coil Hot Fire 4-Jet
In AGS)
V11N10E, 31E, R1 67777
GUID CONT - AGS
MODE CONT: AGS - ATT HOLD
ATTITUDE CONTROL (3) - MODE CONT
ACA/4 JET (CDR) - ENABLE
CDR ACA (Deflect slowly to Hardover, Pause at Null)
  ROLL Rt - R1 27757
  Lt - 27737
  PITCH Up- 27776
  Dn- 27775
  YAW Rt- 27767
  Lt- 27773

GUID CONT-PGNS
MODE CONT: AGS - AUTO

122:13
TIG-2:10

V41N7ZE

21 73 +18000 TRUN
  +27000 SHFT

04 12 000006
  00002
  PRO

CB (11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

*413 + 1E Store Azimuth (°°°°°)

*544R X Gyro Coeff
*545R Y Gyro Coeff
*546R Z Gyro Coeff

*400 +6E Calibrate Gyros

*400R (+ 0 Calibrate Complete In 5 min 2 sec)

*544R X
*545R Y
*546R Z
If Gyro Coeff Changes More Than 2.0°/hr, AGS Failed
*400+3E AGS/PGNS Align
*413+1E Store Azimuth

*047R________ Sin Az Comp
*053R________ Sin Az Comp

Transmit The Following To MSFN:
NO4, NO5, N93, 047, 053

UP DATA LINK - DATA
TELEMETRY PCM - HI

MSFN Uplinks CSM State Vector
& LGC Gyro Compensation

122:53
TIG-1:30
Copy Ascent And CSI Pads

*047________ E Sin Az Comp
*053________ E Cos Az Comp
*225________ E aLower Limit
*226________ E aUpper Limit
*231________ E RLS

123:38
TIG-45

If Star In L, F, or R AOT Detent,
Position RR Antenna Along (0°, 283°)
Via V41N72:

CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close

V41N72E

21 73 +00000 TRUN
+00000 +28300 SHFT

04 12 00006
00002
PRO
CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open
V44E

P57E
04 06 00001 00004 Landing Site
   PRO
06 34 T Align
   Load TIG
   PRO
05 06 00010 00003 Gravity & Star
   00110
   PRO

V16 N20E
Monitor Gravity Measurement
NO ATT LT - On Then Off, Twice

+04200
+31800
+03500

KEY REL

06 04 + Gravity Error Angle
   PRO

Basic Date --- June 16, 1969
Changed --- July 2, 1969
If Gyro Torquing Angles >5°: - see sec question

06 22 ICDU Angles

PRO

NO ATT Lt - On Then Off

01 70 OOCDE Detent, Star
Load Desired Star

PRO

06 79 _______ Cursor

_________ Spiral

_________ Detent Position

PRO

01 71 OOCDE Detent, Star

PRO

Read Cursor Angle _______

54 71 MARK X OR Y

Read Spiral Angle _______

06 79 _______ Cursor, ______ Spiral

Load Cursor & Spiral Angles ______ ______

V32E Remark Star

PRO After 2 Recycles

06 05 _______ Angle Diff

PRO

06 93 _______ X Torque Angle

_______ Y Torque Angle

_______ Z Torque Angle

PRO (Monitor Gyro Torquing)

50 25 00014

PRO For Alignment Check

01 70 OOCDE Detent, Star
Load Desired Star

PRO
POOE

If RR Antenna Along (0°, 283°)
Slew RR Along +X Axis Via V41N72

CB(11) AC BUS A: RNDZ RDR - Close
Wait 30 sec
PGNS: RNDZ RDR - Close

V41N72E
21 73 +18000 TRUN
+27666 SHFT
32.5
04 12 00006
00002
PRO

CB(11) PGNS: RNDZ RDR - Open
AC BUS A: RNDZ RDR - Open

V44E

CB(11) AC BUS B: AOT LAMP - Open
AOT - CL/0.0°

SET CAMERA
FOR ASCENT
16mm/HCEX/OVERHEAD
(F4, 500, INF) 12 fps

LM CONSUMABLES UPDATE
GET ________:____
RCS A _______ B____
DESC O2 __________
DESC A-H __________
ASC A-H __________
Don Helmets & Gloves
Attach Restraints

V48E
01 46 12012 DAP Config
    PRO
06 47 _______ LM Wt
    _______ CSM Wt
    PRO

GUID CONT - PGNS
MODE CONTROL (PGNS) - AUTO
V77E

P12E
06 33 : : TIG ASC
(124:23:21.3)
    PRO
06 76 _______ VH Final
    ( )
    _______ H Dot Final
    ( )
    _______ Xrng
    ( )
    PRO

06 74 : : TFI
    Yaw
    _______ Pitch

ET - Set/Up

*232 R +00600 Ins Alt
*465 R +00320 Ins H Dot
*410 R +00000 Orb Ins guidance mode

*547 R +0 Lunar Align Az
          \n          \
          \
          \n          \n          \n          
          
          

*623 + 0E +2 Along CSM Plane
*400 + 4E Lunar Align

CB(11) RCS SYS A: QUAD 4,3,2,1 TCA (4)-Close
STAB/CONT: AELD - Close
EPS: INV 1 - Close

CB(16) RCS SYS B: QUAD 1,2,3,4 TCA (4)-Close
STAB/CONT: AELD - Close
PROP: DES HE REG/VENT - CLOSE

X POINTER SCALE (2) - HI MULT
RATE/ERR MON (2) - LDG RDR/CMPTR
ATT MON - PGNS
GUID CONT - PCNS
MODE SEL - AGS
RNG/ALT MON - ALT/ALT RT
RATE SCALE - 25°/SEC
ACA PROP (2) - ENABLE
ENG ARM - OFF
ATT/TRANSI - 4 JETS
BAL CPL - ON
ASC He REG 1&2 tb(2)-gray
ABORT - Reset
ABORT STAGE - Reset
ENGINE STOP (2) - Reset
PRP LAT TEMP/PRESS - ASC
HEL MON - ASC PRESS 1

SYS A&B QUAD 1,2,3,4 (8) tb-gray
SYS A&B ASC FEED 1&2 tb(4)-bp
SYS A&B MAIN SOV tb(2)-gray
CRSF tb-bp
TEMP/PRESS MON - OXID MANF
GLYCOL - PUMP 1
SUIT FAN - 1
02/H2O QTY MON - ASC 1
ATTITUDE MON - AGS
RADAR TEST - OFF
RR MODE - LGC -
DEAD BAND - MIN
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL (Both) - AUTO
TEMP MONITOR - RNDZ RDR
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
ACA/4 JET (CDR) - ENABLE
ACA/4 JET (S) - ENABLE (LMP) DISABLE
TTCA/TRANSIL (2) - ENABLE DISABLE
TTCA (Both) - JETS (Dn)

MASTER ARM - OFF
STAGE - SAFE/Guarded

DES H20 - CLOSE
WATER TANK SEL - ASC
ASC H20 - OPEN
DES O2 - CLOSE
ASC O2 No. 1 - OPEN
CABIN REPRESS - CLOSE
SUIT GAS DIVERTER - PULL/EGRESS
CABIN GAS RETURN - AUTO
SUIT CIRCUIT RELIEF-AUTO
PRESS REG A&B - EGRESS

Launch Guidance System
Recommendation From MSFN
DES PROPULSION FUEL VENT 1 OPEN
DES PROPULSION OXID VENT 2 OPEN
ASC He REG 1&2 - tb(2)-gray
MASTER ARM - ON
ASC He SEL - BOTH
ASC He PRESS - FIRE
MASTER ARM - OFF
SYS A ASC FEED 2-OPEN
    tb (2) - gray
Monitor Sys A Manif Press
SYS A MAIN SOV - CLOSE
    tb-bp
CRSFD-OPEN, tb-gray
SYS B ASC FEED 2-OPEN
    tb (2)-gray
Monitor Sys B Manif Press
SYS B MAIN SOV-CLOSE
    tb-bp

BAT 5,6 - ON
BAT 1,3 - OFF/RESET, tb-bp
CB(11 & 16) EPS: ASC ECA CONT (2) - Close
V47E
06 16 PGNS/AGS BIAS

*414 + 1E
PRO
*414R + 0 Complete
50 16 Update Complete
PRO

124:06
TIG-17

FROM 50-13

VHF A: XMT - VOICE/RNG
RCVR - ON
VHF B: XMT - OFF
RCVR - ON
AUD. (Both) VHF A - T/R
VHF B - RCV

124:13
TIG-10

TRACK MODE - AUTO

Verify CB Status Chart

**Note:** Do not use tape meter in PGNS; i.e.,
do not place mode select sw to PGNS

**Note:** If ENG ARM CB does not close
then do not place ENG ARM to OFF
at 50fps. Stop engine via stop pb
at OFFS.
Check APS, RCS, ECS & EPS

TIG-5
BAT 2,4 - OFF/RESET, tb-bp
DES BATS - DEADFACE, tb-bp

If tb-bp
CB(11) EPS: DES ECA-OPEN
: DES ECA CONT-OPEN
CB(16) EPS: DES ECA-OPEN
: DES ECA CONT-OPEN

Check APS START Card
CAMERA ON

TIG-2
Check APS Configuration Card
*400 + 1E Guid Steering

TIG-1
MASTER ARM - ON
*500 R

TIG-35
DSKY BLANKS

TIG-30
06 74 TFI
YAW
PITCH

TIG-05
ABORT STAGE - PUSH
ENG ARM - ASC
PRO

NO IGN:
GUID CONT - AGS
NO IGN: GUID CONT-P&NS
ENGINE START - PUSH

ENGINE START - PUSH
EMERGENCY LIFT-OFF

1  Bat 5&6: NORM - ON tb-gray
   BAT 163 - OFF/RESET tb-bp

2  DES H2O - CLOSE
   WATER TANK SEL - ASC
   ASC H2O - OPEN
   DES 02 - CLOSE
   #1 ASC 02 - OPEN
   CABIN REPRESS - CLOSE

3  CLOSE ALL CB's EXCEPT:
   CB(11) STAB/CONT: DECA PWR - OPEN
   ECS: CABIN FAN 1 - OPEN
   PGNS: LDG RDR - OPEN
   STAB/CONT: AEA - OPEN
   CB(16) PROPUL: PQGS - OPEN
   STAB/CONT: DES ENG OVRD - OPEN
   COMM: TV - OPEN
   ECS: GLYCOL PUMP SEC-OPEN
       CABIN FAN CONT-OPEN
   EPS: CROSS TIE BUS - OPEN
       CROSS TIE BAL LOADS-OPEN

   IF TIME PERMITS:
   Don Helmets And Gloves
   SUIT GAS DIVERTER
      -PULL/Egress
   CABIN RELIEF-AUTO
   PRESS REG A&B-Egress

1  Perform P-27 Update
   (REFSMAT/STATE VECTOR)

AGS ACTIVATION

1  AGS STATUS - OPERATE (Master Alarm,
   AGS Warning Lt-ON)

   02/H2O QTY MON - C/W RESET Then ASC 1
   (AGS Warning Lt - OFF)

ALIGN PGNS
P57E
04 06  00001
      00004 LANDING SITE
      PRO
06 34 00000,00000,00000 Present Time
      PRO
05 06  00010
      00001 REFSMMAT & Gravity
      00110
      PRO
V16 N20E ICDU Angles
Monitor Gravity Measurement
No ATT Lt - ON, Then OFF, Twice

KEY REL

06 04 + Gravity Err Angle
     PRO

06 22 ICDU Angles
     PRO
     NO ATT LT - ON, Then OFF

06 05 Angular Error/Difference
     PRO

06 93 Gyro Torquing Angles
     PRO (Monitor Gyro Torquing)

50 25 00014
     V34E

AGS INITIALIZATION

1 V16 N65E
   16 65 LGC Time

2 Compute AGS Time (GET - 90:00:00)
   (.1min)

   *377 +
   *ENTR At 90 +

3 V47E
   F 06 16

   *240 E X Position Comp
   *262 E Z Velocity Comp
   *254 E Epoch Time
   *414+2E Nav. Initial via DEDA

4 *414+1E
     PRO

5 *414R (+0)

6 F 50 16 Downlink Complete, PRO

7 *400+3

8 413+1E
TARGET PGNS

1
V77E
GUID CONT - PGNS
MODE CONT (BOTH) - AUTO

2
P 12 E
06 33 _____:_____:____ TIG ASC
    PRO
06 76 _______ VH FINAL
        HDOT FINAL
        XRNG
        PRO
06 74 ____:____ TFI
        YAW
        PITCH

TARGET AGS

1
*232 +
*465 +
*225 +
*226 +
*410 + 0
*411 + 1
MASTER ARM-ON
ASC He SEL-BOTH
ASC He PRESS-FIRE
MASTER ARM-OFF
SYS A&B ASC FEED 2(2) - OPEN
SYS A&B MAIN SOV (2) - CLOSE
CRSPD - OPEN

ENABLE CONTROLS

1
ACA PROP (BOTH) - ENABLE
ACA/4 JET (BOTH) - ENABLE
ATT CONT (3) - MODE CONT
TTCA/TRANS (BOTH) - ENABLE
MODE SEL - AGS
RNG/ALT MON - ALT/ALT RT
CONFIGURE COMM

P = 45 (+45)
Y = 35 (-35)

TRACK MODE - AUTO
VHF A: XMT - VOICE/RNG
RCVR - ON
VHF B: RCVR - ON
AUDIPO (BOTH): VHF A - T/R
VHF B - RCV

BEGIN FINAL COUNTDOWN

TIG-5:00
BATS 2&4 - OFF/RESET tb-bp
DESBATS - DEADFACE tb-bp
Check APS START Card

TIG-2:00
*400 + 1

TIG-1:00
MASTER ARM - ON
*500 R

TIG-:35
DSKY BLANKS

TIG-:30
06 74 TFI
_________ YAW
_________ PITCH

TIG-:05
ABORT STAGE-PUSH
ENG ARM-ASC
PRO

NO IGN: GUID CONT - AGS
NO IGN: GUID CONT
ENG START - PUSH
ENGINE START - PUSH