

CSM { 106.220  
118 After chg -

Attached is Revision 1, dated 4-16-70 04:00 CST, to the Entry Sequence.

This revision contains two things:

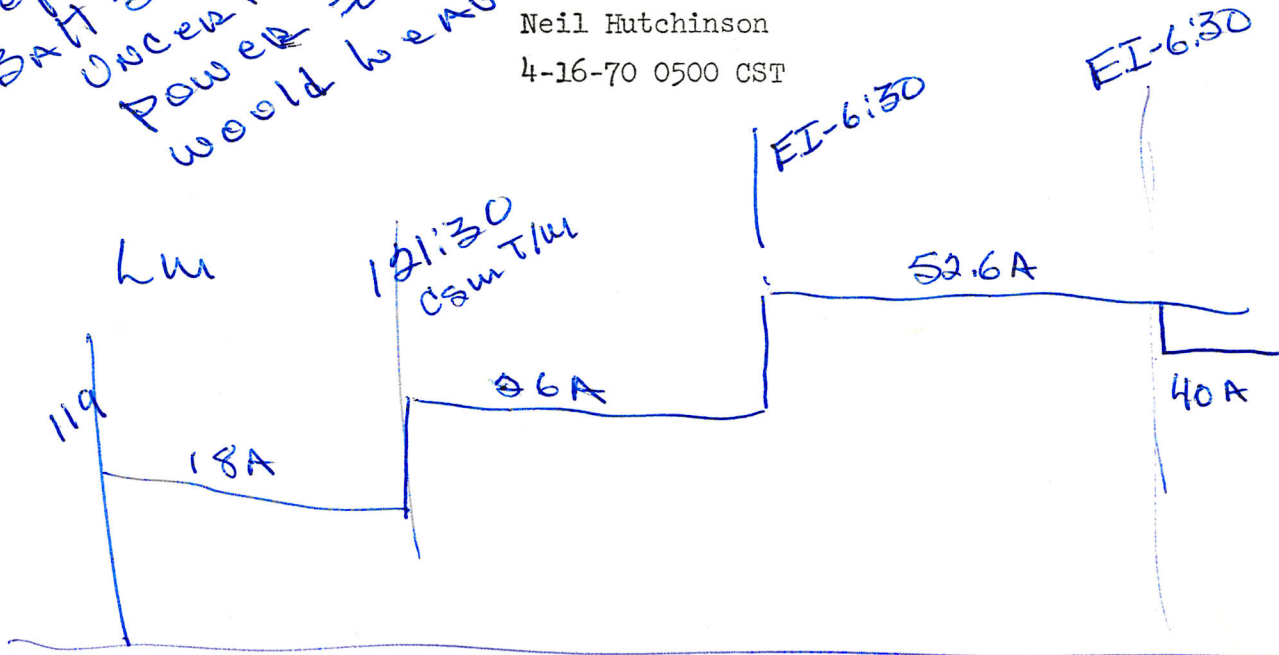
- (1) A crew (Mattingly, Evans, Roosa) has run the CSM switch configuration and CSM portion of the timeline in the CMS resulting in a few configuration changes.
- (2) A crewman (John Young) has indicated the timeline is too tight from EI-5+30 to EI-3+30. Hence, we have moved all activities from EI-3+30 back 1 hour. In order to do this, we are assuming the CSM will have LM power available for battery charging and selected other tasks.

There are three subjects that have not been integrated into this checklist yet:

- 1. LM systems configuration & switch lists
- 2. Photographing SM after CM/SM separation
- 3. Stowage plan and configuration

Keep BATT 51W Reserve  
Uncertainty in total  
power  $\approx 200A$ ,  
would have MARGIN  $\approx 40AH$ .

Neil Hutchinson  
4-16-70 0500 CST





ENTRY SEQUENCE

REVISION: 1

4/16/70  
0400 CST

CHECKLIST

EI-6+30

COPY LM & CM PADS

LIOH CANNISTERS, STOW ORDEAL

EMS MNA & MNB - OPEN (PNL 8)

G/N COMPUTER MNA & MNB - CLOSED

G/N IMU HTR MNA & MNB - CLOSED

BATT A ENTRY & PL CB - CLOSED

BATT B ENTRY & PL - CLOSED

BATT C ENTRY & PL - CLOSED

MNB BATT BUS B - CLOSED

MNA BATT C CB - CLOSED

INST PWR CNTL CB 3 & 4 - OPEN

SELECT P-06

ESS INST PWR MNA & MNB - CLOSED

PRIM EVAP H<sub>2</sub>O CNTL VLV - AUTO

SEC EVAP H<sub>2</sub>O CNTL VLV - AUTO

AT COMPLETION OF PREHEAT CHECKLIST GO TO E 1-5 STEP 35

CM RCS PREHEAT

ESS INST PWR MNA & B - OPEN

EI-5+05

EARTH TERMINATOR ACS ALIGN

EI-5+00

MCC 7

MANEUVER TO SEP ATTITUDE

EI-4+40

PERFORM PYRO BATT CHECK FIRST 3 LINES OF STEP 39 E 1-6

PNL 8

ALL CLOSED EXCEPT

DIR ULLAGE MNA & MNB



with low Power until

ENTRY SEQUENCE

4/16/70

~~0400 CST~~

1430 CST

REVISION: 1 2+30

CHECKLIST

EI-6+30

COPY LM & CM PADS

INSTALL LIQH CANNISTERS, STOW ORDEAL

EMS MNA & MNB - OPEN (PNL 8)

~~G/N COMPUTER MNA & MNB - CLOSED~~

~~G/N IMU HTR MNA & MNB - CLOSED~~

BATT A ENTRY & PL CB - CLOSED

BATT B ENTRY & PL *cb* - CLOSED

BATT C ENTRY & PL *cb* - CLOSED

MNB BATT BUS B - CLOSED

MNA BATT C CB - CLOSED

INST PWR CNTL CB 3 & 4 - OPEN

~~SELECT P-06~~

ESS INST PWR  MNB *cb* - CLOSED

PRIM EVAP H<sub>2</sub>O CNTL VLV - AUTO (cw)

SEC EVAP H<sub>2</sub>O CNTL VLV - AUTO (cw)

~~AT COMPLETION OF PREHEAT CHECKLIST GO TO E 1-5 STEP 35~~

CM RCS PREHEAT

~~ESS INST PWR MNA & B - OPEN~~

*C&W MNB CB - CLOSED*

*C&W PWR - 1*

EI-5+05

EARTH TERMINATOR AGS ALIGN

EI-5+00

MCC 7

MANEUVER TO SEP ATTITUDE

EI-4+40

PERFORM PYRO BATT CHECK FIRST 3 LINES OF STEP 39 E 1-6

PNL 8

ALL CLOSED EXCEPT

DIR ULLAGE MNA & MNB - OPEN

MAIN B LIGHTING

PNL 8 FLOOD - FIXED

PNL 5 INTERIOR LTS RHODSTAT TO FLOOD

LEB 100 FLOOD - FIXED

*cb BATT CHRG BATA CHRG - CLOSE*

*cb BATT CHRG BATT B CHRG - CLOSE*

*MAIN BUS TIES (2) - ON (UP)*

*EPS SENSOR SIG MNA MNB - CLOSE*

*EPS SENSOR UNIT DC BUS A & B*

*MAIN BUS A & B - CLOSE - RESET/CENTRE*



CM RCS HTR MNA & MNB - open  
~~SM RCS HTRS (4)~~ SM RCS HTRS C MNB - open  
 SM RCS HTRS D MNA - open  
 EMS (2)  
 SPS GAUGING (4) - open  
 SPS P & Y (4) - open  
 FLOAT BAG (3) - open  
 EDS (3) - open  
 PL VENT / FLT/PL - open  
 ESS INST PWR MNA & MNB - closed  
 CM RCS ACTIVATION STEP 41 E 1-6

EI-4+30

VERIFY LM CONFIGURED  
 ROT CNTL PWR NORMAL (2) - AC/DC  
 SCS LOGIC PWR 2/3 - ON  
 RCS COMMAND - ON  
 CM RCS CHECK STEP 4 E 2-1 WITH EXCEPTION OF FOLLOWING:  
 MAN ATT SW TO ACCEL CMD VICE RATE CMD  
 DELETE STEPS: RCS TRANS - SM  
 MAN ATT (3) - RATE CMD  
 s/c CONT - CMC AUTO

LOCK RHC'S  
 SECS PYRO (2) - ~~ON (UP)~~ ARM  
 LM +X 0.5 FT/SEC  
 CM/SM SEP (2) - ON (UP)  
 LM -X 0.5 FT/SEC  
 SECS PYRO (2) - SAFE  
 ESS INST PWR MNA & MNB - OPEN  
 LM PITCH UP TO ACQUIRE SM AND PHOTOGRAPH  
 (IM USE ACA FOR ALL ROTATIONS)

EI-3+00 G/N Cptr MNA/B closed  
 Ver Prog 06, PRO - Stby  
 LM START MANEUVER TO LM ALIGN ATTITUDE

EI-2+30

INVERTER PWR 1, 2, 3 - CLOSED





CM RCS HTR MNA & MNB - OPEN  
~~SM RCS HTRS (4)~~ SM RCS HTRS C MB - OPEN  
EMS (2) ~~SM RCS HTRS D MNA~~ - OPEN  
SPS GAUGING (4) - OPEN  
SPS P & Y (4) - OPEN  
FLOAT BAG (3) - OPEN  
EDS (3) - OPEN  
PL VENT / FLT / PL - OPEN

~~ESS INST PWR MNA & MNB - CLOSED~~

CM RCS ACTIVATION STEP 41 E 1-6  
EI-4+30 SECS LOGIC (2) - OFF (DOWN)

VERIFY LM CONFIGURED  
~~G/N JIM~~ ~~G/N HTR MNA, MNB~~ G/N JIM HTR ~~MNB~~ - CLOSED

ROT CNTL PWR NORMAL (2) - AC/DC

SCS LOGIC PWR 2/3 - ON

RCS COMMAND - ON

CM RCS CHECK STEP 4 E 2-1 WITH EXCEPTION OF FOLLOWING:

MAN ATT SW TO ACCEL CMD VICE ~~RATE CMD~~ MIN IMP

DELETE STEPS: RCS TRANS - SM

MAN ATT (3) - RATE CMD

s/C CONT - CMC AUTO

LOCK RHC'S

SECS PYRO (2) - ~~ON (UP)~~ ARM

LM +X 0.5 FT/SEC

CM/SM SEP (2) - ON (UP)

LM -X 0.5 FT/SEC

SECS PYRO (2) - SAFE

~~ESS INST PWR MNA & MNB - OPEN~~

LM PITCH UP TO ACQUIRE SM AND PHOTOGRAPH

(LM USE ACA FOR ALL ROTATIONS)

EI-3+00

LM START MANEUVER TO LM ALIGN ATTITUDE  
G/N COMPUTER MNA, MNB - CLOSED

~~EI-2+30~~ VERIFY PWR PRO STANDBY  
V37E OGE PRO - STANDBY

~~INVERTER PWR 1, 2, 3 - CLOSED~~

~~FLOOD LIGHTS - DIM (AS REQ'D)~~

EI: - 2+30



CB ESS INST MNA - CLOSED  
CB IMU HTR MNA - CLOSED  
CB G/N COMPUTER MNA - CLOSED  
CB LM PWR 1 - OPEN  
CB LM PWR 2 - OPEN  
CB MNB BATT BUS B - CLOSED  
INVERTER PWR 1, 2, 3 - CLOSED

went this

~~drop~~

why not

LM PWR 2 W  
TO OFF



BATT RELAY BUS BATT A & B CB	- CLOSED
INV CONTROL 1-2 & 3 CB'S	- CLOSED
AC INVERTER 1	- MNA
AC INV AC BUS 1	- ON (UP)
AC INV AC BUS 2	- ON (UP)
EPS SENSOR SIG AC 1 & 2	- CLOSED
EPS SENSOR UNIT AC 1 & 2	- CLOSED
ESS INST MNA & MNB	- CLOSED
C&W MNA & B	- CLOSED
<u>C&amp;W</u>	
NORMAL	- ACK
CSM	- CM
PWR	- 1
AC INV AC BUS 1 & 2	- RESET (CNTR)
EPS SENSOR SIGNAL MNA & MNB	- CLOSED
EPS SENSOR UNIT DC BUS A & B	- CLOSED
MNA AND MNB	- RESET (CNTR)
<u>PNL 225</u>	
FLT BUS MNA & MNB	- CLOSED
CTE MNA & B	- CLOSED
<u>PNL 5</u>	
PWR AMPL	- HIGH
TELECOM GROUP 1	- AC 1
TELECOM GROUP 2	- AC 2
S-BAND NORM XPONDER	- PRIM
UPTL CMD RESET - RESET THEN NORM	
PWR SCE	- NORM
PWR PMP	- NORM
<u>PNL 275</u>	
FLT AND P.L. MNA & MNB	- CLOSED
CONFIGURE FOR COMM ON PNL 6, 9 & 10	
IMU MNA & B	- CLOSED
OPTICS MNA & B	- CLOSED
G&N PWR AC 1	- CLOSED



BATT RELAY BUS BATT A & B CB - CLOSED  
 INV CONTROL 1-2 & 3 CB'S - CLOSED  
 AC INVERTER 1 - MNA  
 AC INV AC BUS 1 - ON (UP)  
 AC INV AC BUS 2 - ON (UP)  
 EPS SENSOR SIG AC 1 & 2 - CLOSED  
 EPS SENSOR UNIT AC 1 & 2 - CLOSED  
~~ESS INST MNA & MNB - CLOSED~~  
 C&W MNA & B - CLOSED

~~ESS~~

~~NORMAL - ACK  
 OSM - CM  
 FWR - 1~~

← AC INV AC BUS 1 & 2 - RESET (CNTR)  
~~EPS SENSOR SIGNAL MNA & MNB - CLOSED~~  
~~EPS SENSOR UNIT DC BUS A & B - CLOSED~~  
~~MNA AND MNB - RESET (CNTR)~~

PNL 225

FLT BUS MNA & MNB - CLOSED  
 CTE MNA & B - CLOSED

PNL 5

*Blas*

~~FWR AMPL - HIGH~~  
 TELECOM GROUP 1 - AC 1  
 TELECOM GROUP 2 - AC 2  
 S-BAND NORM XPONDER - PRIM

UPTL CMD RESET - RESET THEN NORM  
 FWR SCE - NORM  
 FWR PMP - NORM  
 PNL <sup>UP TM</sup> 275 - ACCEPT

FLT AND P.L. MNA & MNB - CLOSED  
 CONFIGURE FOR COMM ON PNL 6, 9 & 10  
 IMU MNA & B - CLOSED  
 OPTICS MNA & B - CLOSED  
 G&N FWR AC 1 - CLOSED





G&N PWR AC 2 - CLOSED  
 G&N PWR SW - AC- 2  
 PERFORM CMC POWER UP - G 2-2  
 EXCEPT SELECT V96 ON FL 37  
 PERFORM EMS CHECK STEP 32 E1-4  
 EMS MNA & MNB CBS - OPEN  
 THEN EMOD, CLOCK INCREMENT UPDATE (COMPLETE BY EI-2+15)  
 STATE VEC, REFSMAT  
 PERFORM IMU POWER UP - G 2-1  
 PERFORM OPTICS POWER UP - G 2-3  
PNL 229  
 CB TIMERS MNA - CLOSED  
 SET MISSION TIMER  
 CSM  
 V41 N20  
 R \_\_\_\_\_ P \_\_\_\_\_ Y \_\_\_\_\_ (FROM LM ATTITUDE)  
 V40 N20 E WHEN AT LM FDAI ANGLES,  
 SET REFSMMAT AND DRIFT FLAGS  
 V37E 52E OPTION 1  
 COARSE ALIGN  
 MARK ON MOON  
 LM MANEUVER TO SUN ATTITUDE  
 PULSE TORQUE  
 LM MANEUVER TO JETTISON ATTITUDE (WATCH GIMBAL LOCK)  
 LM MIN DB, ATT HOLD

EI-1+30

PROCEED WITH CLOSEOUT AND HATCH INSTALLATION; LEAVE LM HATCH OPEN  
 PERFORM HATCH DECAL  
 LM TUNNEL VENT VLV - CM/LM ΔP  
 EMERG CABIN REGS - BOTH  
 SUIT DEMAND REGS - BOTH  
 WATER AND GLYCOL TANK REGS INLET AND OUTLET - BOTH  
 ECS TRANSDUCERS PRESS GROUP 1 & 2 MNA & MNB (4) - CLOSED

*ECS Gly Pump 1-AC-1*



G&N PWR AC 2 - CLOSED  
 G&N PWR SW - AC- 2  
 PERFORM CMC POWER UP - G 2-2  
 EXCEPT SELECT V96 ON FL 37  
 PERFORM EMS CHECK STEP 32 E1-4  
 EMS MNA & MNB CBS - OPEN  
 THEN EMOD, CLOCK INCREMENT UPDATE (COMPLETE BY EI-2+15)  
 STATE VEC, REFSMAT

PERFORM IMU POWER UP - G 2-1  
 PERFORM OPTICS POWER UP - G 2-3

PNL 229

CB TIMERS MNA - CLOSED  
 SET MISSION TIMER

CSM

V41 N20

R \_\_\_\_\_ P \_\_\_\_\_ Y \_\_\_\_\_ (FROM LM ATTITUDE)

V40 N20 E WHEN AT LM FDAI ANGLES,  
 SET REFSMMAT AND DRIFT FLAGS

V37E 52E OPTION 1

COARSE ALIGN

MARK ON MOON

LM MANEUVER TO SUN ATTITUDE

PULSE TORQUE

LM MANEUVER TO JETTISON ATTITUDE (WATCH GIMBAL LOCK)

LM MIN DB, ATT HOLD

~~MAIN A BATT A~~ Cb MAIN A BATT A - CLOSED  
 Cb MAIN B BATT C - CLOSED

EI-1+30

PROCEED WITH CLOSEOUT AND HATCH INSTALLATION; LEAVE LM HATCH OPEN

PERFORM HATCH DECAL

LM TUNNEL VENT VLV - CM/LM ΔP

EMERG CABIN REGS - BOTH

SUIT DEMAND REGS - BOTH

MAIN REGS (2) - OPEN  
 WATER AND GLYCOL TANK REGS INLET AND OUTLET - BOTH

ECS TRANSDUCERS PRESS GROUP 1 & 2 MNA & MNB (4) - CLOSED

ECS GLYCOL PUMPS 1 - AC 1



SURGE TANK - ON IF NO OPS  
 - OFF IF OPS USED FOR PRESS  
 INCREASE CABIN PRESS TO 5.5 PSIA (DIRECT O<sub>2</sub> OR OPS)  
 VERIFY LM-CM ΔP - POSITIVE AND NOT DECREASING

EI-1+20

BMAG #1 PWR - WARMUP

EI-1+10

SCS ELEC PWR - GDC/ECA  
 SIG COND DRIVER BIAS PWR 1 - AC-1  
 BMAG #1 PWR - ON  
 - WAIT 1 MIN -  
 BMAG MODE SWS (3) - RATE 1  
 SUIT COMPRESSOR 2 - A/C 1  
 S/C CONTROL - SCS  
 MAN ATT SWITCHES (AS DESIRED)  
 PERFORM GDC ALIGN  
 ROT CNTL PWR DIRECT 1 & 2 - MNA/MNB

EI-1+00

SECS PYRO ARM (2) - UP/ON  
 CSM/LM FINAL SEP (2) - UP/ON  
 SECS PYRO ARM (2) - SAFE  
 SUIT COMPRESSOR 1 - OFF  
 CONFIGURE FOR SINGLE RING  
 MANEUVER TO ENTRY ATTITUDE

EI-55 MINS

SEXTANT STAR CHECK  
 PARK OPTICS 90° SHAFT  
 OPTICS POWER OFF  
 STOW OPTICS  
 EMS MAIN A & B CB'S - CLOSED  
 INITIALIZE EMS



SURGE TANK - ON ~~II-NO-OPS~~  
~~OFF-II-OPS-USED-FOR-PRESS~~

INCREASE CABIN PRESS TO 5.5 PSIA <sup>USING</sup> DIRECT O<sub>2</sub> ~~OR OPS~~

VERIFY LM-CM ΔP - POSITIVE AND NOT DECREASING FOR 10 MINS

~~PWR AMP OFF~~  
~~APTES AND RESET OFF~~

EI-1+20

BMAG #1 PWR - WARMUP

EI-1+10

SCS ELEC PWR - GDC/ECA

SIG COND DRIVER BIAS PWR 1 - AC-1

BMAG #1 PWR - ON

- WAIT 1 MIN -

BMAG MODE SWS (3) - RATE 1

SUIT COMPRESSOR ① 2 - A/C 1

S/C CONTROL - SCS

MAN ATT SWITCHES (AS DESIRED)

PERFORM GDC ALIGN

ROT CNTL PWR DIRECT 1 & 2 - MNA/MNB

~~ECS CONTROL PUMPS AC 1~~

EI-1+00

SECS PYRO ARM (2) - UP/ON

CSM/LM FINAL SEP (2) - UP/ON

SECS PYRO ARM (2) - SAFE

~~SUIT COMPRESSOR 1 OFF~~

CONFIGURE FOR SINGLE RING

MANEUVER TO ENTRY ATTITUDE

EI-55 MINS

SEXTANT STAR CHECK

PARK OPTICS 90° SHAFT

OPTICS POWER OFF

STOW OPTICS

EMS MAIN A & B CB'S - CLOSED

INITIALIZE EMS STEP 2 E2-1





EI-45 MINS

ENTRY PAD & STATE VECTOR  
 MANEUVER TO MOON ATTITUDE

EI-40

BMAG #2 PWR - WARMUP  
 VERIFY SURGE TANK & REPRESS PKG ON

EI-30

BMAG #2 PWR - ON  
 MNA BATT BUS A CB - CLOSED (PNL 275)  
 MNB BATT C CB - CLOSED  
 ECS GLYCOL PUMPS 1 - AC-1  
 ACTIVATE PRIMARY EVAPORATOR  
 GO TO ENTRY CHECKLIST E 2-2 (P61)

EI-3 (MOON SET)

CHECK IMU AND GDC ATT - INTO CHECKLIST E 2-5  
 HORIZON CHECK

EI+5

TELCOM GROUP 1 & 2 - OFF - INTO CHECKLIST E-2-5  
 PWR SCE - OFF AFTER EMS ROLL - ON (UP)  
 PWR PMP - OFF



EI-45 MINS

ENTRY PAD & STATE VECTOR  
MANEUVER TO MOON ATTITUDE

EI-40

BMAG #2 PWR - WARMUP

VERIFY SURGE TANK & REPRESS PKG ON

**CB ENV CONT SYS WASTEWATER/URINE DUCT HTRs(2) - CLOSED**

EI-30

**SUIT COMPRESSOR 2 - OFF**

BMAG #2 PWR - ON

MNA BATT BUS A CB - CLOSED (PNL 275)

MNB BATT C CB - CLOSED

~~ECS GLYCOL PUMPS 1 AC 1~~

ACTIVATE PRIMARY EVAPORATOR

*WANT*  
GO TO ENTRY CHECKLIST E 2-2 (P61)

EI-3 (MOON SET)

CHECK IMU AND GDC ATT - INTO CHECKLIST E 2-5  
HORIZON CHECK

~~EI-5~~ BEGIN BLACKOUT

~~TELCOM GROUP 1 & 2 - OFF~~

- INTO CHECKLIST E-2-5  
AFTER EMS ROLL - ON (UP)

PWR SCE - OFF

PWR PMP - OFF

