Apollo 10 Entry checklist

VEHICLE PREPARATION

1 INITIAL STOWAGE COMPLETED

2 CMC & ISS START UP

3 SCS POWER UP

4 P51 - IMU ORIENTATION

5 LOAD DAP
V48E 11102, 01111, PRO, PRO, PRO

6 -06:00h LAST MCC DECISION

7 -05:35h NO COMM - P52 & NAV SIGHTINGS
NOMINAL - P23!37 ONBOARD COMPARISON

8 DON MAE WESTS &FOOT RESTRAINTS

9 VHF AM A – SIMPLEX

10 -04:30h P 27 (SV, REFSMMAT), MNVR
& ENTRY PAD UPDATES11 -04:15h P52 - IMU REALIGN

11 -04:15h P52 - IMU REALIGN
(_:_:_) (OPTION 1)

12 P37 (NO COMM ONLY)

13 ECS CKS

O2 SUPPLY REFILL
ECS Monitor Check
EVAP H20 CONT (2) valves - AUTO
SUIT HEAT EXCH SEC GLY – FLOW

14 EPS CKS #1, 3, 4 (5 If req'd)

15 SPS CK (If req' d)

16 RCS CKS
SM RCS Monitor Check
CM RCS Monitor Check

17 C&W SYS CK

18 CMC SELF CK

19 DSKY COND LT TEST

20 -03:45h MIDCOURSE MANEUVER
P30 - EXT DELTA V

-03:l5h P40/41 - SPS/RCS THRUSTING

-03:00h MIDCOURSE (#7) BURN

21 NO COMM NAV SIGHTINGS

22 MNVR TO ENTRY ATT (Supercircular only-Trans Earth)
V62E

22A V49E

22B F 06 22 DESIRED FINAL GMBL ANGLES (0.01°)
LOAD ENTRY ATT PAD ANGLES
PRO

22C F 50 18 REQ MNVR TO FDAI RPY ANGLES (0.01°)
(AUTO) SC CONT - CMC
BMAG MODE (3) - RATE 2
CMC MODE - AUTO
PRO
MAN SC CONT - SCS
MNVR to 22E

22D 06 18 AUTO MNVR TO FDAI RPY ANGLES (0.01°)

22E F 50 18 REQUEST TRIM
(TRIM) Go to 22C
(BYPASS) ENTR

23 -2:00hr BORESIGHT & SXT STAR CHECK
OPT MODE - CMC
OPT ZERO – OFF

V41 N91E

F 21 92 SHAFT, TRUN (0.01°, 0.001°)
Load SXTS angles

41 OPTICS DRIVE

CHECK SXT STAR
OPT ZERO - ZERO
CHECK BORESIGHT STAR (If available)

24 -01:35h P52 - lMU REALIGN
Record gyro torquing angles
R
P
Y

If: >1°, recycle P52
If confirmed, use SCS for EMS entry

25 (_:_:_) GDC ALIGN
If drift >10°/hr, change rate. source

26 FINAL STOWAGE
OPTICS (except for hybrid)
ORDEAL
GLY TO RAD SEC - BYPASS (verify)
Cool panel installed
Y-Y struts (2) extended
Stow Data Box R-12

27 -01:15h EMS CHECK
EMS FUNC - OFF
cb EMS (2) - close
EMS MODE - STBY
EMS FUNC - EMS TEST 1 (wait 5 sec)
EMS MODE - NORMAL (wait 10 sec)
Check indicator lights - off
RANGE indicator - 0.0
Slew halr1ine over notch
In self-test pattern
EMS FUNC - EMS TEST 2 (wait 10 sec)
.05G It - on (all others out)
EMS FUNC - EMS TEST 3
.05G It - on
RSI Lower It - on (10 sec later)
Set RANGE counter to 58 nm+0.0
EMS FUNC - EMS TEST 4
.05G It - on (all others out)
G-V trace within pattern to lower right corner @9G
RANGE indicator counts down to 0+0.2
EMS FUNC - EMS TEST 5
.05G light - on
RSI upper light - on (10 sec later)
RANGE md - 0.0
Scribe traces vertical line 9g to
0.22+0.1
ALIGN SCROLL TO ENTRY PATTERN (on
37K ft sec line)
EMS FUNC - RNG SET
G-V scroll assembly traces vert. line
0.22g to 0+0.1
EMS MODE – STBY

29 PRIMARY WATER EVAP ACTIVATION
GLY EVAP H20 FLOW - AUTO
GLY EVAP STH PRESS - AUTO
PRI ECS GLY PUMP – ACI

30 -01:10h CM RCS PREHEAT
Note: If sys test meter 5c,5d,6a, 6b, 6c, 6d
all read 3.9 vdc (28°F) or more,
Omit preheat
cb RCS LOGIC (2) - close
CM RCS LOGIC - ON
UP TLM CM – BLOCK (Verify)
cb CM RCS HTRS (2) - close
CM RCS HTRS - ON (LMP Confirm)
(20 min or until lowest reading is 3.9 vdc) (Monitor Manifold pressure for pressure drop)

31 (_:_:_) FINAL GDC DRIFT CK (If req'd)
If drift >10°/hr, Suspect GDC. Do not use RSI & FDAI #2

32 -00:50m TERM. CM RCS PREHEAT
UP TLM CM - BLOCK (verify)
CM RCS HTRS - OFF
CM RCS LOGIC – OFF

33 SYSTEMS TEST PANEL CONFIGURATION
SYS TEST METER - 4B
RNDZ XPNDR - OPERATE
CM RCS HTRS - OFF
WASTE H20 DUMP - OFF
URINE DUMP – OFF

34 LEB LIGHTING – OFF

35 SEC WATER EVAP ACTIVATION
GLY To RAD SEC valve - BYPASS
SEC COOL EVAP - EVAP
SEC COOL PUMP - AC2

36 PYRO BATT CK
cb PYRO A SEQ A – close (verify)
cb PRYO B SEQ B - close (verify)
DC IND - PYRO BAT A(B)
If PYRO BAT A(B) < 35 vdc
cb PYRO A(B) seq A(B) - open
PYRO A(B)BAT BUS A(B) TO PYRO
MN BUS TIE – close
cb MNA BAT C - close
cb MNB BAT C - close

DC IND - MNB
PNL 8 - All cb's closed except:
PL VENT - open (verify)
FLOAT BAG (3) - open (verify)
DOCKING PROBE (2) - open (verify)
EDS BAT (3) – open (verify)
CM RCS HTRS (2) – open

37 CM RCS ACTIVATION
cb SECS ARM (2) - close (verify)
cb SECS LOGIC (2) - close (verify)
SECS LOGIC (2) - ON
MSFN confirm GO for PYRO ARM (if possible)
SECS PYRO ARM (2) - ARM
CM RCS PRPLNT 1&2 - ON
CM RCS PRESS - ON
RCS indicator switch – CM 1, then 2
He PRESS 3,700-4,400 psia
MANF PRESS 287-302 psia
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) – OFF

38 -00:45m P27 & ENTRY PAD UPDATE

39 SUPERCIRCULAR ENTRY

40 SET DET [Digital Event Timer] (up, to EI)

41 EMS INITIALIZATION
SET RNG TO PAD DATA RNG
EMS FUNC - Vo SET
Slew Scroll to Pad Data VI0
EMS FUNC - ENTRY

42 RSI ALIGNMENT
FDAI SOURCE - ATT SET
ATT SET - GDC
EMS ROLL - on (up)
GDC ALIGN PB - PUSH &HOLD
YAW Two - Position RSI through 45° & back to LIFT UP
GDC ALIGN PB - Release
EMS ROLL - OFF
Align CDC to IMU

43 CM RCS RING A check
RCS TRNFR - CM

cb CM RCS LOGIC MNB - open
AUTO RCS SEL MNB (6) - OFF
SC CONT - SCS
Test Ring A Thrusters
SC CONT - CMC
RCS TRNFR - SM
AUTO RCS SEL (12) – MNA/MNB
(liftoff config)
cb CM RCS LOGIC MNB – close

44 OPTICS PWR - OFF
CMP to COUCH

MN BUS TIE (2) – ON
(-30:00) TAPE RCDR – REWIND

45 SEPARATION CK LIST
(-25:00) TVC SERVO PWR 1 – AC1 / MNA
cb ELS (2) - close (verify)
PRIM GLY TO RAD - BYPASS (pull)
PLSS O2 valve - FILL
O2 SM SUPPLY valve - OFF
CAB PRESS REL valve (2) - NORM
GMBL MTRS (4) - START
ABORT SYS PRPLNT - RCS CMD (verify)
SM RCS PRIM PRPLNT (4) - ON
VHF AM (A&B) - OFF
HI GAIN ANT PWR - OFF
FC PUMPS (3) - OFF
Verify single Suit compressor open, loads balanced
FC 2 MN A&B - OFF
S BD PWR AMP - LOW
cb ECS RAD CONT/HTR (2) - open
cb WASTE H20/URINE DUMP HTRS (2) - open
cb HTRS OVLD (2) - open
POT H2O RTR - OFF
CAB FAN (2) - OFF
GLY EVAP TEMP IN - MAN
SEC COOL EVAP - RESET
SEC COOL PUMP - off (center)

MNVR TO CM/SM SEP P, R ATT
SC CONT - SCS
CMC MODE - FREE
MNVR TO PAD ATT
R _____ (0°)
P _____
Y _____(0°)

P61 - ENTRY PREP

(-19:00)

46 V37E 61E

05 09 01427 - ROLL REVERSED
*05 09 01426 - IMU UNSAT *

47 F 06 61 IMPACT LAT, LONG, HDS UP/DN (+/-)
PRO (.01°, , fps ,±00001)

48 F 06 60 GMAX,VPRED,GAMMA EI (.01° ,fps, .0l°)

Record
GMAX_____
V400K_____
GAMMA EI_____
PRO

49 F 06 63 RTOGO (.l nm) _____ PAD _____
VIO (fps) _____ PAD _____
TFE(min-sec) _____

Compare with MSFN for PGNS GO/NO GO
If NO COMM, Set RTOGO & VIO in EMS
& initialize
(ACCEPT) PRO
(RECALC) V32E To 4

P62 - CM/SM SEP & PRE-ENTRY MNVR
CAUTION: Call No EXT Verbs in P62

50 F 50 25 00041 REQUEST CM/SM SEP
SC CONT - SCS/FREE

COMPARE PITCH ATT WITH PAD DATA _____
(within 5°)

(-17:00)
YAW - 45° OUT-OF-PLANE (LEFT)
RATE - HIGH
ATT DB - MIN
MAN ATT (3) - RATE CMD
BMAG MODE (3) – ATT 1/RATE 2
MN BUS TIE (2) - ON (verify)
PRIM GLY TO RAD - BYPASS (verify)
CM RCS LOGIC - ON (verify)
SECS LOGIC (2) - on (up)
SECS PYRO ARM – ARM

(-15:00)
CM/SM SEP (2) - ON
CSM/LM FNL SEP (2) - on (up) (verify)
C&W MODE - CM
RCS TRNFR - CM
CM RCS MANF PRESS - 287-302 psia
CM RCS LOGIC - OFF
SECS PYRO ARM (2) - SAFE
Monitor VMA / B:
If <25 vdc go to EMERG POWERDOWN page E/6-l

(-10:00)
AUTO RCS SEL A/C ROLL (4) - OFF
AUTO RCS SEL CM 2(6)-OFF
AUTO RCS SEL CM 1(6)-MNA
YAW back to 0°
PITCH TO HORIZ TRACK ATT
ROLL - 0° (LIFT UP)
PITCH - 400K Horizon Mark (31.7°)
YAW - 0°
ATT DB - MAX
MAN ATT PITCH - ACCEL CMD
EMS DATA - Verify
EMS FUNC - ENTRY (verify)
EMS MODE - NORMAL
cb SPS P&Y (4) - open
MAINT HORIZ TRK
PRO (Act ENTRY DAP)

51 F 06 61 IMPACT LAT,LONG,HDS / DN (.01°,.01°,-00001)
PRO

52 POSS 06 22 FINAL ATT DISP, RPY (.01°)
(Only if X-axis beyond 45° of Velocity vector)

P63 - ENTRY INIT

53 06 64 G,VI,RTOGO (.01G, fps, .1 nm)
FDAI SCALE - 50/15
ROT CONTR PWR DIR (both) - MNA/MNB
TAPE RCDR - CMD RESET/HBR/FWD
HORIZ CK
(-2:00) Pitch error needle goes toward zero approaching .05G time
MAN ATT (PITCH) - RATE CMD
If CMC is GO:
BMAG MODE (3) - RATE 2
SC CONT - CMC/AUTO
* If DAP NO GO *
* SC CONT – SCS *
* FLY BETA *
* If CMC NO GO *
* SC CONT – SCS *
* FLY EMS *

P64 - ENTRY POST .05G

54 RTOGO AT .05G AGREES HITH EMS-verify
HORIZ CK
.05G Lt - ON (EMS START)

.05G time * No EMS START within 3 sec: *
(+0 :) * EMS MODE - BACKUP /VHF RNG *

.05G switch - on (up)
EMS ROLL - on (up)
06 68 BETA, VI, HDOT (.01°, fps, fps)
Compare RSI & FDAI
If CMC or PAD commands Lift DN,
MNVR Lift DN
EMS GO/NO GO
G-V Plot within limits
Rng ctr dwn 60±7 during 10 sec
period
Monitor G-meter for convergence with pad data (Do)[planned drag level during constant g phase]

(V<27K fps) Go to 57

P65 - ENTRY – UP (V<27K fps)

55 F 16 69 BETA (.01°) _____

DL (.0l G) _____ PAD _____

VL (fps) _____ PAD _____

* IF NO AGREEMENT *
* SC CONT - SCS *
* FLY EMS *

PRO

56 06 68 BETA,VI,HDOT (.01°, fps, fps)
(V<V1+500 fps & RDOT Neg)

P67 - ENTRY - FINAL PHASE (0.2G)

57 06 66 BETA,CRSRNG ERR,DNRNG ERR
(.01°, .1nm, .1nm)
KEY VERB
Record DNRNG ERR _____
KEY RLSE
Monitor lift vector on RSI & FDAI

16 67 RTOGO,LAT,LONG (Vrel=1,000fps)
(.1 nm, .01°, .01°)
SC CONT - SCS
RTOGO NEG - LIFT UP
RTOGO POS - LIFT DOWN
Monitor altimeter

Earth landing

90K (ft) STEAM PRESS – PEGGED [evaporator]
50K (ft) CABIN PRESS REL valve (2) - BOOST/ENTRY
SECS PYRO ARM (2) – ARM

40K (ft) * CM UNSTABLE *

(i.e. 90K (ft) + 63s) * RCS CMD - OFF *

* 40K (ft) APEX COVER JETT PG-PUSH *
*DROGUE DEPLOY PG - PUSH (2 sec *
*after apex cover Jett) *

30K (ft) ELS LOGIC - ON (up)
ELS - AUTO

24K (ft) RCS disable (auto)
(i.e. 90K'+92s) *RCS CMD - OFF*
Apex cover jettison (auto)
APEX COVER JETT PB - PUSH
(WAIT 2 SECS)
Drogue parachutes deployed (auto)
DROGUE DEPLOY PB – PUSH

If Drogues Fail
*ELS – MAN *
*Stablilize CM *
5K' MAIN DPLY PB - PUSH
*ELS – AUTO *

23.5K (ft) Cabin Pressure increasing (Drogues + 50s)
*If not increasing by 17K (ft) *
CABIN PRESS REL valve (RR) - DUMP

10K (ft) Main parachutes deployed
MAIN DEPLOY PB - PUSH (within 1 sec)
VHF ANT - RECY
VHF AMA - SIMPLEX
VHF BCN - ON
CABIN PRESS REL valve (2) - CLOSE
DIRECT O2 valve - OPEN

CM RCS LOGIC - on (up)
CM PRPLNT - DUMP (burn audible)
Monitor CM RCS 1&2 for He press decrease
*NO BURN or PRESS DECREASE *
* USE BOTH RHC's *
*DO NOT FIRE PITCH JETS *
CM PRPLNT-PURGE (to zero He press)
*CM RCS He DUMP PB - PUSH *
*RHC (2) - 30 secs *
* NO PITCH *
STRUT LOCKS (2) – UNLOCK

cb FLT & PL BAT BUS A, B, & BAT C (3) - close
cb FLT & PLT MNA & B (2) - open
cb ECS RAD HTR OVLD (2) - open
cb SPS P&Y (4) – open

3K (ft) CABIN PRESS REL valve (RH) - DUMP (after purge completed)
FLOOD Lights - POST LDG
CM RCS PRPLNT (2) - OFF
ROT CONTR PWR DIRECT (2) – OFF

800 (ft) CAB PRESS RELF valve - CLOSE (latch off)
MN BUS TIE (2) - OFF
AFTER LANDING:
cb MAIN REL PYRO (2) - close
MAIN RELEASE - on(up)

POSTLANDING

STABILIZATION, VENTILATION, COMMUNICATIONS

1 DIRECT O2 valve – CLOSE

2 Stabilization after landing
ELS - AUTO (verify)
cb MAIN REL PYRO (2) - close (verify)
MAIN RELEASE - on (up) (verify)
SCS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb BAT RLY BUS (2) - open
No contact w1th recovery forces
*VHF AM A&B - off (center) *
*VHF AM Rev ONLY - A *
cb PL VENT - close
cb FLOAT BAG (3) - close
cb UPRIGHT SYS COMPRESS (2) - close
If Stable 2 [inverted]:
FLOAT BAG(3)-FILL till 2 min after upright, then - OFF
VHF AM A/B & BCN - OFF while inverted
If Stable 1 [upright]:
After 10 Min Cooling Period,
FLOAT BAG (3) - FILL 7 min, then OFF

3 Post Stabilization and Ventilation
PL BCN LT - BCN LT LOW
PL VENT valve - UNLOCK (Pull)
Remove PL VENT Exhaust Cover
PL VENT - HIGH or LOW
PL DYE MARKER - ON (swimmer comm)
Release foots traps and restraints
cb MNA BAT BUS A & BAT C (2) - open
cb MNB BAT BUS B &BAT C (2) - open
cb FLT & PL BAT C - open
cb PYRO A SEQ A - open
cb PYRO B SEQ B - open
*EACH HR - CHECK DC VOLTS> 27.5 V *
*If Not *
* cb FLT & PL-BAT BUS A&B (2) -open*

* cb FLT & PL BAT C (1) - open *
* GO TO LOW POWER CHECKLIST *
Unstow and install PLV [Post Landing Ventilation] DISTRIB DUCT
Deploy grappling hook and line if req.

4 Post Landing Communications
VHF ANT-RECY (verify)
VHF BCN - ON (verify)
If no contact ~lth recovery forces perform VHF BEACON Check
MONITOR VHF BEACON transmission with VHF AM B Receiver and/or Survival Transceiver
*VHF Beacon not operating *
connect Survival Transceiver to antenna
cable behind VHF ant access panel and place radio in BCN mode

LOW POWER CHECKLIST
VHF BCN - OFF
VHF AM (3) - RCV
FLOOD Lights - OFF
VHF AM A&B - off (center)
VHF AM RCV ONLY - A (verify)
COUCH LIGHTS - OFF
POSTLANDING VENT SYS: minimize use
SURV RADIO - plug into VHF BCN ANT cable conn behind VHF ant access panel & turn radio on in BCN mode

EGRESS PROCEDURES

STABLE 1
Disconnect Umbilicals
Neck dam on

CMP Center couch - 270° position

CDR, LMP Armrests stowed

CDR Connect raft to S/C, l-f desired, with green lanyard
Connect raft whlte lanyards to suits & inflate water wings when exiting
HATCH PISTON PRESS valve - PRESS (Outboard)

CMP Side Hatch opened

CDR PL VENT – OFF

CMP cb Panel 250 (all) - open
Egress with life raft

LMP Put hardware kit out

LMP, CDR Egress