

ABORT PROCEDURES

MODE IA ABORT
(00:00 to 01:01)

00:00 TRANS CONTR - CCW then NEUTRAL
CM/SM SEP (2) - on (up)

ELS - AUTO

00:14 ELS LOGIC - on (up)
TWR JETT (2) - on (up)
APEX COVER JETT PB - PUSH

00:16 DROGUE DEPLOY PB - PUSH

00:18 CM RCS He DUMP PB - PUSH

Monitor altimeter

If <alidade - DEPLOY MAINS

>alidade - NO ACTION

00:28 If <10,000 ft - DEPLOY MAINS

Note: Alidade set for 3800 ft true altitude prior to Launch

Go to LANDING PHASE pg L/4-8

MODE IB ABORT
(01:01 to 16.5 nm)

00:00 TRANS CONTR - CCW then NEUTRAL
CM/SM SEP (2)-on (up)

ELS - AUTO

00:11 CANARD DEPLOY - PUSH

00:14 ELS LOGIC - on (up)
RCS CMD - ON

Go to LANDING PHASE pg L/4-8

DATE 3/7/72

MODE I

MODE IC ABORT
(16.5 nm to TWR JETT)

00:00 TRANS CONTR - CCW then NEUTRAL
CM/SM SEP (2) - on (up)
RCS CMD - ON

00:11 CANARDS DEPLOY
CM RCS PRESS - on (up)
RCS TRNFR - CM
RCS IND - CM (1 or 2)
C/W MODE - CM

S/C PLATFORM GO/NO GO (Excessive Rates)
KEY RLSE to N44, Check HA

HA>32nm & PLAT GO	HA<32nm or PLAT NO GO
TWR JETT sw(2)-on(up)	Estab. +5°/SEC
MAN PITCH - RATE CMD	pitch rate
ENT ATT RO°, P135°, YO°	EXCESSIVE + PITCH RATES
BMAG (3)- ATT1/RATE 2	
EMS FUNC - ENTRY	*ROLL 90° *
EMS MODE - NORMAL	*USE YAW THRUSTERS TO *
At .05G Lt,	*CONTROL RATE *
.05G sw - on (up)	*ROLL BACK TO HEADS DN*
Fly Max Lift	
	e (.05G) _____
	GET DROGUE _____

Go to LANDING PHASE pg L/4-8

LET FAILS TO JETTISON

LEGS CUT/NO MOTOR FIRE (pyro audible)
LES MOTOR FIRE PB - push
NO RESPONSE to ABORT SYS TWR JETT switches
cb SECS ARM (2) - close (verify)
cb SECS LOGIC (2) - close (verify)
cb EDS (3) - close (verify)
SECS LOGIC (2) - on (up) (verify)
SECS PYRO ARM (2) - on (up) (verify)
EDS PWR - on (up) (verify)
ABORT SYS TWR JETT (2) - on (up) (verify)
NO TWR JETT - continue to orbit
ABORT SYS TWR JETT (2) - off (ctr)

MODE II RCS ABORT
(TWR JETT to MODE III)

- 00:00 TRANS CONTR - CCW (4 sec min)
 If No BECO: Reset THC
 * Req. RSO Shutdown *
 * Reset & start DET *
- 00:03 *CSM/LV SEP - PUSH*
 *RCS CMD - ON *
- THC - ARMED
- 00:05 TRANS CONTR - NEUTRAL THEN +X
- 00:24 TRANS CONTR +X OFF
 KEY RLSE to N44, Check TFF
 If TFF > 2 min, Yaw 45° (LEFT) out-of-plane
 BMAG MODE (3) - ATT1/RATE 2
 cb MNA&B BAT C (2) - close
 CM/SM SEP - on (up)
 CM RCS PRESS - on (up)
 RCS TRNFR - CM
 C&W MODE - CM
 Entry ATT - (R=0°, P=120°, Y=0°) (Comp1 by 1:40)
 cb CSM/LM FNL SEP (2) - close (pull lanyard)
 CSM/LM FNL SEP (2) - on (up)
 EMS FUNC - ENTRY GET 300K _____
 EMS MODE - NORMAL 0 (.05G) _____
 GET DROGUE _____
- At .05G lt - on
 .05G sw - on (up)
 EMS ROLL - on (up)
 Fly Max Lift
 N62E, VI, HDOT, H

Go to LANDING PHASE pg L/4-8

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MODE III SPS ABORT
($\Delta R = -400$ NM to INSERTION)

00:00 TRANS CONTR - CCW (4 Sec Min)
 *If No BECO: Reset THC *
 * LV STAGE sw - SII/SIVB*
 * Reset & start DET *

00:03 *CSM/LV SEP - PUSH*
 *RCS CMD - ON *

THC - ARMED

00:05 TRANS CONTR - NEUTRAL THEN +X
 LV/SPS IND sw - GPI

00:24 TRANS CONTR +X OFF
 N5OE $\Delta R, HP, TFF$ (.1nm,min-sec)
 BMAG MODE (3) - ATTI/RATE2
 If $\Delta R > 0$:
 MNVR to retro att ($R=180^\circ, P=194^\circ, Y=0^\circ$)
 (Scribe on horiz, BEF, Hds up)
 SCS TVC P&Y - AUTO (verify)
 EMS MODE - NORMAL
 ΔV THRUST A - NORMAL

02:05 DIRECT ULLAGE PB - PUSH
 THRUST ON PB - PUSH
 Burn to VC ($\Delta R=0$)
 ΔV THRUST (2) - OFF

GETI _____
 (6999.9)
 ΔV _____
 VC _____
 θ _____
 Δtb _____
 GET 300K _____
 θ (.05G) _____
 GET Drogue _____

If $TFF > 2$ min, Yaw 45° (LEFT)
 out-of-plane
 cb MNA&B BAT C(2) - close
 CM/SM SEP - on (up)
 CM RCS PRESS - on (up)
 RCS TRNFR - CM
 C&W MODE - CM
 MnvR to entry att ($R=0^\circ, P=105^\circ, Y=0^\circ$)
 (BEF, Hds Dn, Full Lift)
 cb CSM/LM FNL SEP (2) - close (pull lanyard)
 CSM/LM ENL SEP (2) - on (up)
 Note TFF

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MODE II, MODE III

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EMS MODE - STBY
EMS FUNC - ENTRY
EMS MODE - NORMAL
At .05G 1t - on
 .05G sw - on (up)
EMS ROLL - on (up)
At .2G 1t - on
 Roll left 55°
Fly Half Lift

Go to LANDING PHASE pg L/4-8

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MODE III, MODE IV

MODE IV SPS TO ORBIT

(VI ~ 22,704, HDOT ~ +72, H ~ +94)

- 00:00 TRANS CONT - CCW (4 sec min)
 *If No BECO: Reset THC *
 * LV STAGE sw - SII/SIVB*
 * Reset & start DET *
- 00:03 *CSM/LV SEP - PUSH*
 *RCS CMD - ON *
- THC - ARMED
- 00:05 TRANS CONTR - NEUTRAL THEN +X
 LV/SPS IND sw - GPI
- 00:24 TRANS CONTR - +X OFF

Perform PITCH PROFILE or FIXED ATTITUDE BURN:PITCH PROFILE (AUTO TVC, tw trim)

- BMAG MODE (3) - ATT1/RATE2
 EMS MODE - NORMAL
 SCS TVC (2) - AUTO (verify)
 ΔV THRUST A - NORMAL
 DIRECT ULLAGE PB - PUSH
- <01:30 THRUST ON PB - PUSH
 BMAG MODE (PITCH) - RATE 1
 FLY HDOT with thumbwheel
 Burn to (hp >70 nm +6 sec BT)
 * or (ha = 200 nm & +HDOT) *
 ΔV THRUST (2) - OFF
 EMS MODE - STBY

or FIXED ATTITUDE BURN (Scribe on horiz, SEF, Hds Dn)

- | | | |
|------------------------------|-------------|--------|
| BMAG MODE (3) - ATT1/RATE2 | GETI | _____ |
| EMS MODE - NORMAL | | 6999.9 |
| SCS TVC (2) - AUTO (verify) | ΔV | _____ |
| ΔV THRUST A - NORMAL | VC | _____ |
| DIRECT ULLAGE PB - PUSH | | |
| 02:05 THRUST ON PB - PUSH | e | _____ |
| BURN to VC (hp >70nm) | | |
| ΔV THRUST (2) - OFF | Δtb | _____ |
| EMS MODE - STBY | | |

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Record VI _____ (fps)
H DOT _____ (fps)
H PAD _____ (.1nm)
KEY RLSE

Record HA _____ (.1nm)
HP _____ (.1nm)
TFF _____ (min-sec)
PRO

V37E 00E

When CMC ACTY 1t out:

V66E

V45E

Load DAP, V48: R1=11102, R2=01111

V46E

V83E (check e)

PRO

CSM WT _____

P TRIM _____

Y TRIM _____

US LOS
(00:15:12)

Go to INSERTION CHECKLIST pg L/2-11

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LANDING PHASE

LANDING PHASE (30K, DESCENDING)

30K' ELS LOGIC - on (up)
ELS - AUTO

24K' Twr jett (auto)
*TWR JETT (2) - on (up) *
Apex cover jett (auto)
APEX COVER JETT PB - PUSH
(wait 2 sec)

Drogues deployed (auto)
DROGUE DPLY PB - PUSH

*If Both drogues Fail: *
* ELS - MAN *
* STABILIZE CM *
* 5K' MAIN DPLY PB - PUSH*
* ELS - AUTO *

23.5K' Cabin Pressure increasing
*If not increasing by 17K': *
* CABIN PRESS REL vlv (RH) - DUMP*

10K' Main parachutes deployed
MAIN DEPLOY PB - PUSH (within 1 sec)
DIRECT O2 vlv - OPEN (verify)
VHF ANT - RECY
VHF AM A - SIMPLEX
VHF BCN - ON

*If No Comm and abort occurred between *
* ~~61 & 75 sec~~ or if land impact expected: *
* Perform CM RCS DUMP, pg L/4-9 *

1:01 & 2:00 min

LANDING PHASE



46 sec

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- CABIN PRESS REL vlv (RH) - DUMP
 STRUT LOCKS (4) - UNLOCK
 (275) cb FLT & PL BAT BUS A,B,&BAT C (3) - close
 cb FLT & PL MNA & B (2) - open
 (5) cb BAT RLY BUS (2) - open
 cb RAD HTRS OVLD (2) - open
 (8) cb SPS P&Y (4) - open
- 3K' CM RCS PRPLNT (2) - OFF
 FLOOD Lts - POST LDG
 ELS - AUTO (verify)
 ELS LOGIC - on (up) (verify)
- 800' CAB PRESS REL vlv (2) - CLOSE (latch off)
 MN BUS TIE (2) - OFF
 COMMAND + E - YAW (1 sec) (Direct Rcs)
- Go to POSTLANDING PROCEDURES, pg L/9-2

CM RCS DUMP

- CABIN PRESS REL vlv (2) - CLOSE
 CM RCS LOGIC - on (up)
 If main or pyro bus lost:
 * Use RHC's for burn, *
 * not DUMP sw *
 CM PRPLNT - DUMP (burn audible)
 MONITOR CM RCS 1&2 for He press decrease
 If no burn or press decrease:
 * Use both RHC's *
 * DO NOT FIRE PITCH JETS *
 CM PRPLNT - PURGE
 *CM RCS He DUMP PB - PUSH *
 RHC (2) - 30 secs, NO PITCH

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PRE-TLI ABORT
 FROM ORBIT

PRE-TLI ABORT FROM ORBIT

- 1 MNVR TO SEP ATT
LV GUID - CMC
Pitch SIVB to Hds up, BEF, 15°
window mk on horizon
Then, LV GUID - IU for orb rate
- 2 LOAD RCS DAP
R1 = 11102, R2 = 01111
V46E
- 3 DON MAE WESTS & FOOT RESTRAINTS
- 4 FINAL STOWAGE
ORDEAL
(377) GLY TO RAD SEC vlv - BYPASS (verify)
Verify EVA COUCH STRUT disengaged
(382) Cool pnl installed
Y-Y struts (2) extended
Stow Data Box R-12
Attach both strut unlock lanyards
WASTE MGMT DRAIN vlv - OFF
- 5 PYRO BATT CK
(250) cb PYRO A SEQ A - close (verify)
cb PYRO 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 *
* cb PYRO A(B)BAT BUS A(B) TO *
* PYRO BUS TIE - close*
(275) cb MNA BAT C - close
cb MNB BAT C - close
DC IND - MNB
- 6 SYSTEMS TEST PANEL CONFIGURATION
SYS TEST METER -5B (BAT RLY BUS
3.4-4.1 vdc)
(101) CM RCS HTRS - OFF (verify)
WASTE H2O DUMP HTR - OFF
URINE DUMP HTR - OFF
(100) LEB FLOOD & INTGL LIGHTING - OFF

PRE-TLI ABORT
FROM ORBIT

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CONFIGURE PNL 8

ALL cb's closed except:
DOCKING PROBE (2) - open (verify)
CM RCS HTRS (2) - open (verify)
FLOAT BAG (3) - open (verify)
SECS ARM (2) - open (verify)
ELS/CM-SM SEP (2) - open (verify)
PL VENT - open (verify)

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CM RCS ACTIVATION

cb SECS ARM(2) - close
Cue MSFN
SECS LOGIC (2) - on(up)
MSFN confirm GO for PYRO ARM (if poss)
SECS PYRO ARM (2) - ARM
CM RCS PRPLNT 1&2 tb(2) - gray (verify)
CM RCS PRESS - ON
RCS IND sw - CM1, then 2
He PRESS stabilizes at 3300-3500
psia after 15 minutes
MANF PRESS 287-302 psia
SECS PYRO ARM (2) - SAFE

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Set DET (counting up to deorbit burn)

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CSM/LV SEPARATION PREP

SM RCS PRPLNT tb (8) - gray (verify)
AUTO RCS SELECT (16) - MNA/MNB
Set ΔV to -100.0
EMS FUNC - ΔV
FDAI SCALE - 5/1
MAN ATT (3) - RATE CMD
LIMIT CYCLE - OFF (verify)
ATT DB - MIN
RATE - LOW
TRANS CONT PWR - on (up) (verify)
ROT CONT PWR NORMAL (2) - AC/DC (verify)
ROT CONT PWR DIRECT (2) - MNA/MNB (verify)
CMC MODE - FREE (verify)
SC CONT - CMC
BMAG MODE (3) - RATE 2 (verify)
cb RCS LOGIC (2) - close (verify)
TVC SERVO PWR #1 - AC1/MNA
FC REAC vlv - LATCH

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CSM/LV SEPARATION

THC - ARMED
RHC #2 - ARMED
cb SECS LOGIC (2) - closed (verify)
cb SECS ARM (2) - closed (verify)
SECS LOGIC (2) - on (up) (verify)
RCS CMD - ON
TAPE RCDR - HBR/RCD/FWD/CMD RESET
SECS PYRO ARM (2) - ARM
GDC ALIGN
EMS FUNC - ΔV (verify)
EMS MODE - NORMAL

38:00 V37E 47E
39:50 CMC MODE - AUTO
39:58 Thrust +X and hold
40:00 CSM/LV SEP pb - push, hold, and release
(-20:00min) LV TANK PRESS - full scale Low

*If No Separation:

* THC - CCW (leave in detent) *
* DET reset and counting up (auto) *
* LV TK PRESS - full scale low (SEP ind)*
*00:03 THC - +X, neutral & hold *
*00:24 THC - release *

SM RCS PRPLNT tb(8) - gray (verify)
SM RCS He tb (8) - gray (verify)
SM RCS SEC PRPLNT FUEL PRESS (4) - CLOSE
FC REAC vlv - NORM

~40:24

$\Delta V = 5$ fps
THC - release
SECS PYRO ARM (2) - SAFE
cb EDS (3) - open
PCM BIT RATE - LOW

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Go to SPS DEORBIT, pg L/8-1

*If time permits, after mnvr to Burn Att: *
* Perform EMS ENTRY CHECK, pg L/5-2 & *
* EMS ΔV TEST & NULL BIAS CHECK, pg G/2-5*

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TLI 90 MIN ABORT

(Return to targeted splash point;
SPS burn at SIVB C/O +90 min)

V37E 47E

If abort decision occurs after CSM/LV
separation, go to 00:14.

SECS LOGIC (2) - on (up)(verify)
SECS PYRO ARM (2) - ARM

(TLI+25min)

00:00 TRANS CONTR - CCW (4 sec)
DET RESET (verify)

00:03 SIVB/CSM SEP
LV ENG 1 Lt - out
CSM/LV SEP PB - PUSH
*RCS CMD-ON *

00:05 THC - ARMED
TRANS CONTR - NEUTRAL THEN +X
LV/SPS IND sw - GPI

00:14 TRANS CONTR +X - OFF
PITCH UP to LOCAL VERT (+X axis
toward the earth)
RATE - LOW
BMAG MODE (3) - ATT1/RATE 2
EDS PWR - OFF
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb SECS ARM (2) - open
cb EDS (3) - open

01:00 TRANS CONTR +X (8 to 10 sec)
V37E OOE
RATE - HIGH
TRANS CONTR PWR - OFF

MNVR TO RETRO ATT
R _____ (Block Data)
P _____ (Block Data)
Y _____ (Block Data)

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TLI 90 MIN ABORT

RETRO UPDATE (NO COMM - use Block Data)

GETI _____ @ .05G _____

ΔV _____

VC _____

Δtb _____

GET 400K _____

GET DROGUE _____

ENTRY R _____

P _____

Y _____

If time permits, go to G&N thrusting procedures;
if time critical, continue with SCS ΔV .

XX:XX Set DET counting up to GETI
GDC ALIGN
EMS FUNC - ΔV SET/VHF RNG
SET ΔV_c ABORT
EMS FUNC - ΔV

TVC CHECK & PREP

(8) cb STAB CONT SYS (all) - close
cb SPS (12) - close
MAN ATT (3) - RATE CMD
LIMIT CYCLE - on (up)
ATT DB - MIN
RATE - LOW
SCS TVC (2) - RATE CMD
 ΔV CG - CSM
TVC GMBL DRIVE P&Y - AUTO

(54:00) MN BUS TIE (2) - ON
(-06:00) TAPE RCDR - HBR/RCD/FWD/CMD RESET
SPS He v1vs (2) - AUTO (verify)
Check N2A & N2B
TVC SERVO PWR #1 - AC1/MNA
TVC SERVO PWR #2 - AC2/MNB
ROT CONTR PWR NORMAL (2) - AC
ROT CONT PWR DIRECT (2) - OFF
BMAG MODE (3) - ATT1/RATE2
SC CONT - SCS
RHC #2 - ARMED

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4-15

(55:00) PRIMARY TVC CHECK
(05:00) GMBL MOT P1-Y1 - START/ON (LMP Cnfrm)
Verify TRIM CONTROL & SET
Verify MTVC
SCS TVC (2) - AUTO
THC - CW
Verify NO MTVC

SEC TVC CHECK

GMBL MOT P2-Y2 - START/ON (LMP Cnfrm)
SET GPI TRIM
Verify MTVC
THC NEUTRAL
Verify GPI returns to trim
Verify NO MTVC
ROT CONT PWR NORM (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
FDAI SCALE - 5/1
LIMIT CYCLE - OFF
RATE - HIGH
UPDATE DET

(59:00)
(-01:00)

EMS MODE - NORMAL
TRANS CONTR PWR - on (up)
 ΔV THRUST A(B) - NORMAL
V37E 47E
THC - ARMED
RHC (2) - ARMED

00:00 ULLAGE & THRUST ON PB - PUSH
SPS THRUST Lt - ON
00:03 ΔV THRUST B(A) - NORMAL
ULLAGE & THRUST ON PB - PUSH

MONITOR THRUSTING
Pc 95-105 psia
EMS COUNTING DOWN
SPS INJ VLVS (4) - OPEN
SPS He vlvs tb-gray
SPS FUEL/OXID PRESS - 170-195 psia
PUGS - BALANCED

00:XX

ECO

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ΔV THRUST A&B - OFF
VERIFY THRUST OFF
SPS INJ VLVS (4) - CLOSED
SPS He vlvs tb (2) - bp
GMBL MTRS (4) - OFF (LMP Confirm)
TVC SERVO PWR 1&2 - OFF

19 F 16 83

ΔV XYZ (CM) (.1fps)
RHC & THC - LOCKED
TRANS CONTR PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
cb DIRECT ULLAGE (2) - open
RECORD ΔV ΔVC _____
EMS FUNC - OFF ΔVX _____
EMS MODE - STBY ΔVY _____
PRO ΔVZ _____
ATT DB - MAX
BMAG MODE (3) - RATE 2
MN BUS TIE (2) - OFF
TAPE RCDR - off (ctr)
PCM BIT RATE - LOW

F37 00E
When CMC ACTY 1t out:
V66E

Go to ENTRY PREP & SUPERCIRC ENTRY PROCEDURE
pg E/1-1

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