Bean

SL-3

SECOND SKYLAB MISSION

FINAL

SKYLAB LAUNCH CHECKLIST

PREPARED BY

FLIGHT PROCEDURES BRANCH

CREW PROCEDURES DIVISION

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER

Houston, Texas

JUNE 12, 1973

SKYLAB LAUNCH CHECKLIST

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CHANGE CONTROL RECORD

SL -1/SL-2 CSM LAUNCH CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
001	FINAL	2/5/73	
002	FINAL	2/5/73	
003	FINAL	2/5/73	
004	FINAL	2/5/73	
005	FINAL	2/5/73	
006	FINAL	2/5/73	
007	FINAL	2/5/73	TI
008	FINAL	2/5/73	
009	FINAL	2/5/73	TI
010	FINAL	2/5/73	
011	FINAL	2/5/73	
012	FINAL	2/5/73	
013	FINAL	2/5/73	
014	FINAL	2/5/73	
015	FINAL	2/5/73	
016	FINAL	2/5/73	
017	FINAL	2/5/73	
018	FINAL	2/5/73	
019	FINAL	2/5/73	
020	FINAL	2/5/73	
021	FINAL	2/5/73	
022	FINAL	2/5/73	

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CHANGE CONTROL RECORD

SL -1/SL-2 CSM LAUNCH CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
023	FINAL	2/5/73	
024	FINAL	2/5/73	
025	FINAL	2/5/73	
026	FINAL	2/5/73	
027	FINAL	2/5/73	
028A	REVISION A	3/16/73	
029			SUPERSEDED BY 037
030	REVISION A	3/16/73	
031	REVISION A	3/16/73	
032	REVISION A	3/16/73	
033	REVISION A	3/16/73	
034	REVISION A	3/16/73	
035			DISAPPROVED
036	REVISION A	3/16/73	
037	REVISION A	3/16/73	
038	REVISION A	3/16/73	
039	REVISION A	3/16/73	
040	REVISION A	3/16/73	
041A	REVISION A	3/16/73	
042	REVISION A	3/16/73	
043	REVISION A	3/16/73	TI
044	REVISION A	3/16/73	

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CHANGE CONTROL RECORD

SL-1/SL-2/SL-3 CSM LAUNCH CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
045	CHANGE A	4/6/73	
046	CHANGE A	4/6/73	
047	CHANGE A	4/6/73	
048	CHANGE A	4/6/73	
049	CHANGE A	4/6/73	
050	CHANGE A	4/6/73	
051	CHANGE A	4/6/73	
052	CHANGE A	4/6/73	
053	CHANGE B (P&I)	4/23/73	
054	CHANGE B (P&I)	4/23/73	
055	CHANGE B (P&I)	4/23/73	
056		SL-3	
057		SL-3	
058	CHANGE C (P&I)	4/30/73	
059	CHANGE C (P&I)	4/30/73	
060	CHANGE D (P&I)	5/8/73	
	SL-2 LAUNCH		
061	FINAL	6/12/73	
062	FINAL	6/12/73	
063	FINAL	6/12/73	
064	FINAL	6/12/73	
065	FINAL	6/12/73	
066	FINAL	6/12/73	
067	FINAL	6/12/73	
068	FINAL	6/12/73	
069	FINAL	6/12/73	

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CHANGE CONTROL RECORD

SL -1/SL-3 CSM LAUNCH CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
070	FINAL	6/12/73	
071	FINAL	6/12/73	
072	FINAL	6/12/73	

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SKYLAB LAUNCH CHECKLIST

LIST OF EFFECTIVE PAGES

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PAGE	DATE
I	6/12/73
II	6/12/73
III	6/12/73
1-1	6/12/73
1-2	6/12/73
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1-4	6/12/73
1-5	6/12/73
1-6	6/12/73
1-7	6/12/73
1-8	6/12/73
1-9	6/12/73
1-10	6/12/73
1-11	6/12/73
1-12	6/12/73
1-13	6/12/73
1-14	6/12/73
1-15	6/12/73
1-16	6/12/73
2-1	6/12/73
2-2	6/12/73
2-3	6/12/73
2-4	6/12/73
2-5	6/12/73
2-6	6/12/73
2-7	6/12/73
2-8	6/12/73
2-9	6/12/73
2-10	6/12/73
2-11	6/12/73
2-12	6/12/73
3-1	6/12/73
3-2	6/12/73
3-3	6/12/73
3-4	6/12/73
3-5	6/12/73
3-6	6/12/73
4-1	6/12/73
4-2	6/12/73
4-3	6/12/73
4-4	6/12/73
4-5	6/12/73
4-6	6/12/73
4-7	6/12/73
4-8	6/12/73
4-9	6/12/73
4-10	6/12/73
4-11	6/12/73
4-12	6/12/73
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4-15	6/12/73
4-16	6/12/73
EMER/1-1	(Sys C/L)
EMER/1-2	(Sys C/L)

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CONTENTS

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LIFTOFF CONFIGURATION

PANEL 1

EMS FUNC - ΔV
EMS MODE - STBY
GTA - off (down)
EMS GTA COVER - Secure
CMC ATT - IMU
FDAI SCALE - 5/5
FDAI SEL - 1/2
FDAI SOURCE - CMC
ATT SET - GDC
MAN ATT ROLL - RATE CMD
MAN ATT PITCH - ACCEL CMD
MAN ATT YAW - RATE CMD
LIM CYCLE - OFF
ATT DBD - MIN
RATE - HIGH
TRANS CONTR PWR - on (up)
RHC PWR NORM (2) - AC/DC
RHC PWR DIR (2) - MNA/MNB
SC CONT - SCS
CMC MODE - FREE
BMAG MODE ROLL - RATE 1
BMAG MODE PITCH - RATE 1
BMAG MODE YAW - RATE 1
SPS THRUST - NORMAL (locked)
ΔV THRUST (2) - OFF (guarded)
SCS TVC PITCH - AUTO
SCS TVC YAW - AUTO
SPS GMBL MOT PITCH (2) - OFF
SPS GMBL MOT YAW (2) - OFF
ATVC GAIN - LO
ELS LOGIC - OFF (guarded)
ELS AUTO - MAN
CM RCS LOGIC - on (up)
CM PRPLNT DUMP - OFF (guarded)
CM PRPLNT PURG - off (down) (guarded)
IMU CAGE - off (down) (guarded)

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EMS ROLL - OFF
.05G sw - OFF
Pc IND sw - Pc
LV/SPS IND sw - SIVB
TVC GMBL DR PITCH - AUTO
TVC GMBL DR YAW - AUTO
EVNT TMR RSET - up (ctr)
EVNT TMR STRT - ctr
EVNT TMR MIN - ctr
EVNT TMR SEC - ctr

PANEL 2

PL VENT vlv - push (lock)
DOCK PROBE EXTD/REL - OFF (guarded)
DOCK PROBE EXTD/RETR (2) tb - gray
DOCK PROBE RETR PRIM - OFF
DOCK PROBE RETR SEC - OFF
S5 - N/A down
SPOT LIGHT - off (ctr)
TUNL LT - OFF
MSN TMR - START
SM RCS PSM 1 He - ctr (CLOSE*)
SM RCS PSM 1 He tb - bp
SM RCS PSM 1 MANF ISOL - ctr (OPEN*)
SM RCS PSM 1 MANF ISOL tb - gray
UP TLM CM - BLOCK
CM RCS PRESS - off (down) (guarded)
RCS IND sw - TK PRESS/QTY
SM RCS QUAD He (4) - ctr (OPEN*)
SM RCS QUAD He (4) tb - gray
SM RCS PSM PRPLNT (4) - ctr (CLOSE*)
SM RCS PSM PRPLNT (4) tb - bp
SM RCS QUAD PRPLNT (4) - ctr (OPEN*)
SM RCS QUAD PRIM PRPLNT (4) tb - gray
SM RCS QUAD SEC PRPLNT (4) tb - gray
RCS CMD - ctr (OFF*)
RCS TRNFR - ctr (SM*)
CM RCS PRPLNT (2) - ctr (on,up*)
CM RCS PRPLNT tb (2) - gray
SM RCS SEC FUEL PRESS (4) - ctr (CLOSE*)

EDS AUTO - on (up)
DOCK RING SEP (2) - off (down) (guarded)
CM/SM SEP (2) - off (down) (guarded)
PRPLNT DUMP - AUTO
2 ENG OUT - AUTO
LV RATES - AUTO
TWR JETT (2) - AUTO (down) (guarded)
LV GUID - IU
MN REL - off(down)(guarded)
MSN TMR HR, MIN, SEC - ctr
C/W NORM - BOOST
C/W CSM - CSM
C/W PWR - 1
C/W LAMP TEST - off (ctr)
C/W MEMORY - ctr (RSET*)
RCS IND sel - SM D
CAB FANS (2) - OFF
H2 HTRS (2) - AUTO
O2 PRESS IND - SURGE TK
O2 HTRS (2) - AUTO
H2 FANS (2) - AUTO
ECS IND sel - PRIM
ECS RAD FLOW AUTO CONT - AUTO
ECS RAD tb - gray
ECS RAD FLOW PWR CONT - off (ctr)
ECS RAD MAN SEL - RAD 1
ECS RAD PRIM HTR - off (ctr)
ECS RAD SEC HTR - OFF
POT H2O HTR - OFF
SUIT CKT H2O ACCUM AUTO - 1
SUIT CKT H2O ACCUM ON - ctr
SUIT CKT HT EXCH - off (ctr) (ON*)
SEC COOL LOOP EVAP - off (ctr) (RSET*)
SEC COOL LOOP PUMP - off (ctr)
SEC EVAP H2O FLOW - off (ctr)
GLY EVAP IN TEMP - MAN
GLY EVAP STM PRESS AUTO - MAN
GLY EVAP STM PRESS INCR - ctr (vlv partially open)
GLY EVAP H2O FLOW - off (ctr)
H2O QTY IND sw - POT
SM H2O TK INLET - CLOSE

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PANEL 3

VHF ANT - SM LEFT
SPS ENG INJ VLV ind (4) - CLOSE
FC RAD (2) - off (ctr) (NORM*)
FC RAD (2) tb - gray
FC HTRS (2) - on (up)
FC IND sel - 1
SPS QTY TEST - off (ctr)
OXID FLOW VLV INCR - NORM
OXID FLOW VLV PRIM - PRIM
PUG MODE - NORM
FC PURG (2) - OFF
SM PWR SOURCE 1 MNA - ctr (on,up*)
SM PWR SOURCE 1 MNA tb - gray
SM PWR SOURCE 2 MNA - OFF
SM PWR SOURCE 2 MNA tb - bp
SM PWR SOURCE 3 MNA - OFF
SM PWR SOURCE 3 MNA tb - bp
MNA RSET - ctr (RSET*)
SPS He vlv (2) - AUTO
SPS He vlv tb (2) - bp
SPS TEMP IND sw - OXID LN
SPS PRESS IND sw - He
FC REACS (2) - ctr (on,up*)
FC REACS (2) tb - gray
H2 VENT - ctr (OFF*)
H2 VENT tb - gray
SM PWR SOURCE 1 MNB - OFF
SM PWR SOURCE 1 MNB tb - bp
SM PWR SOURCE 2 MNB - OFF
SM PWR SOURCE 2 MNB tb - bp
SM PWR SOURCE 3 MNB - ctr (on,up*)
SM PWR SOURCE 3 MNB tb - gray
MNB RSET - ctr (RSET*)
DC IND sel - MNA
BAT CHARGE - OFF
S BD XPNDR - PRIM
S BD PWR AMPL PRIM - PRIM
S BD PWR AMPL HI - HIGH
PWR AMPL tb - gray

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S BD MODE VOICE - VOICE
S BD MODE PCM - PCM
S BD MODE RNG - RNG
S BD AUX TAPE - ctr
S BD AUX TV - ctr
UP TLM DATA - DATA
UP TLM CMD - NORM
S BD ANT OMNI - B
S BD ANT - OMNI
VHF AM SQUELCH A tw - noise +1
VHF AM A - off (ctr)
VHF AM B - DUPLEX
VHF AM RCV - off (ctr)
VHF BCN - OFF
VHF RNG - OFF
S BD SQUELCH - ENABLE
FC REACS vlv - LATCH
H2 PURG LINE HTR - OFF
TV SOURCE - CM
VHF AM SQUELCH B tw - noise +1
TAPE RCDR PCM - PCM/ANLG
TAPE RCDR RCD - RCD
TAPE RCDR FWD - FWD
TAPE MOTION tb - gray
SCE PWR - NORM
PMP PWR - NORM
PCM BIT RATE - HIGH
PTT BU - NORM
AC INV 1 - MNA
AC INV 2 - MNB
AC INV 3 - OFF
INV 1 AC 1 - on (up)
INV 2 AC 1 - OFF
INV 3 AC 1 - OFF
AC 1 RSET - ctr (RSET*)
INV 1 AC 2 - OFF
INV 2 AC 2 - on (up)
INV 3 AC 2 - OFF
AC 2 RSET - ctr (RSET*)
AC IND sel - BUS 2 ØC

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PANEL 4

SPS GAUGING - OFF
TELCOM GRP 1 - AC1
TELCOM GRP 2 - AC2
GLY PUMPS - 1 AC1
SUIT COMPR 1 - AC1
SUIT COMPR 2 - OFF
cb Panel 4 - all closed

PANEL 5

MN BUS TIE (2) - on (up)
SM PWR SOURCE 1 - FC1
SM PWR SOURCE 3 - FC3
FC1 PUMPS - AC1
FC3 PUMPS - AC2
SM RCS ENG PKG HTRS (4) - off (ctr)
SM RCS QUAD HTRS (4) - off (ctr)
SM RCS PSM 1 HTRS - off (ctr)
SPS HTRS - OFF
INTGL LTS - as desired
FLOOD LTS - OFF, (full dim or full brt)
FLOOD DIM - 1
FLOOD FIXED - OFF
BAT CHARGER - AC1
cb Panel 5 all closed except:
  cb FLT/PL BUS BAT A,B,C, (3) - open
  cb H2O/UR DUMP HTR (2) - open
  cb EXP PWR A EXP BUS - open
  cb O2 VAC ION PUMPS (2) - open

PANEL 6

MODE - INTERCOM/PTT
PWR - AUDIO/TONE
PAD COMM - OFF
INTERCOM - T/R
S BD - T/R
VHF AM - T/R
AUDIO CONT - NORM
SUIT PWR - on (up)
tw settings - as desired

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PANEL 7

EDS PWR - on (up)
SCS TVC SERVO PWR #1 - AC1/MNA
SCS TVC SERVO PWR #2 - AC2/MNB
FDAI/GPI PWR - BOTH
LOGIC 2/3 PWR - on (up)
SCS ELEC PWR - GDC/ECA
SCS SIG CONDR/DR BIAS 1 - AC1
SCS SIG CONDR/DR BIAS 2 - AC2
BMAG PWR (2) - ON
DIRECT O2 vlv - OPEN (CCW) (>2 in. H2O on SUIT/CAB ΔP ind)
(O2 flow - 0.7-0.9 lb/hr)

PANEL 8

cb Panel 8 - all closed except:
  cb CM RCS HTRS (2) - open
  cb SPS GAUGING (4) - open
  cb FLOAT BAG (3) - open
AUTO RCS SEL A/C ROLL A1 - OFF
AUTO RCS SEL A/C ROLL C1 - OFF
AUTO RCS SEL A/C ROLL A2 - OFF
AUTO RCS SEL A/C ROLL C2 - OFF
AUTO RCS SEL B/D ROLL B1 - MNA
AUTO RCS SEL B/D ROLL D1 - MNB
AUTO RCS SEL B/D ROLL B2 - MNA
AUTO RCS SEL B/D ROLL D2 - MNB
AUTO RCS SEL PITCH A3 - MNB
AUTO RCS SEL PITCH C3 - MNA
AUTO RCS SEL PITCH A4 - MNA
AUTO RCS SEL PITCH C4 - MNB
AUTO RCS SEL YAW B3 - MNA
AUTO RCS SEL YAW D3 - MNB
AUTO RCS SEL YAW B4 - MNB
AUTO RCS SEL YAW D4 - MNA
INT NUM LT - as desired
INT INTGL LT - as desired
INT FLOOD LT - OFF, full dim, or full brt
FLOOD LTS DIM - 1
FLOOD LTS FIXED - OFF
FLOAT BAG (3) - VENT (locked)
SECS LOGIC (2) - on (up) (locked)
SECS PYRO ARM (2) - on (up) (locked)

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PANEL 9

MODE - INTERCOM/PTT
PWR - AUDIO/TONE
PAD COMM - OFF
INTERCOM - T/R
S BD - T/R
VHF AM - T/R
AUDIO CONT - NORM
SUIT PWR - on (up)
VHF RNG - NORM
tm settings - as desired

PANEL 10

MODE - INTERCOM/PTT
PWR - AUDIO/TONE
PAD COMM - OFF
INTERCOM - T/R
S BD - T/R
VHF AM - T/R
AUDIO CONT - NORM
SUIT PWR - on (up)
tm settings - as desired

PANEL 12

MDA TUNL VENT vlv - MDA/CM ΔP

PANEL 13

FDAI sw (2) - INRTL
EARTH/LUNAR - PWR OFF
ALT SET - 104
LTG - OFF
MODE - HOLD/FAST
SLEW - off (ctr)

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PANEL_15

COAS PWR - OFF
UTIL PWR - OFF
PL BCN LT - off (ctr)
PL DYE MARKER - off (down)(guarded)
PL VENT - OFF

PANEL_16

e-p SPECT - ON
UTIL PWR - OFF

PANEL_98

XMIT/ICOM - off (ctr)
CALL/SLEEP - SLEEP
VOL tw - as req'd
SPKR/HEADSET - HEADSET

PANEL_100

UTIL PWR - OFF
FLOOD LTS DIM - 1
FLOOD LTS FIXED - OFF
G/N POWER/OPTICS - OFF
G/N POWER/IMU - on (up)(guarded)
G/N LTS - AC1
NUMERICS LT - as desired
FLOOD LTS - off, full dim, or full bright
INTGL LT - as desired

PANEL_101

SYS TEST (LH) - 3
SYS TEST (RH) - B
CM RCS HTRS - OFF
WASTE H20 DUMP - HTR A
UR DUMP - HTR A

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PANEL 122

OPT ZERO - ZERO
OPT TELTRUN - SLAVE TO SXT
OPT COUPLING - DIRECT
OPT MODE - MAN
OPT SPEED - LO
COND LAMPS - ON
UP TLM - ACCEPT

PANEL 163

GLYCOL EVAP TEMP IN - NORM

PANEL 164

S1 - ON (verified at panel closeout)

PANEL 201

C/W INPUT (all) - ENABLE

PANEL 223

R C/W TONE ADJUST - as des'd
L C/W TONE ADJUST - as des'd
CTR C/W TONE ADJUST - as des'd

PANEL 225

cb Panel 225 - all closed

PANEL 226

cb Panel 226 - all closed except:
  cb FC1 RAD BAT RLY - open
  cb H2 VENT BAT RLY - open
  cb FC3 RAD BAT RLY - open
  cb COAS/TUNL LTG MNB - open
  cb CB40 - open

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PANEL_227

SCI PWR - OFF

PANEL_229

cb Panel 229 all closed except:
  cb PYRO BUS A BAT BUS A - open
  cb PYRO BUS B BAT BUS B - open
  cb MAIN REL PYRO (2)- open

PANEL_230

cb Panel 230 - all open
CSM/SWS INTERFACE PWR (2) - DISCONNECT
CSM/SWS INTERFACE PWR tb - gray
CSM/SWS INTERFACE SIG - DISCONNECT
CSM/SGS INTERFACE SIG tb - gray

PANEL_250

cb Panel 250 - all closed except:
  cb MN BUS INTERCONNECT (2) - open

PANEL_251

WASTE MGMT OVBD DRAIN vlv - OFF

PANEL_252

BAT VENT vlv - VENT
WASTE STOWAGE VENT vlv - VENT

PANEL_274

cb Panel 274 - all closed

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PANEL 275

cb Panel 275 - all closed except:
  cb MNA BAT C - open
  cb MNB BAT C - open
  cb BAT BUS A MNA - open
  cb BAT BUS A BAT C - open
  cb BAT BUS A PYRO BAT A - open
  cb BAT BUS B MNB - open
  cb BAT BUS B BAT C - open
  cb BAT BUS B PYRO BAT B - open

PANEL 276

cb Panel 276 - all closed

PANEL 277 (CSM 117 only)

EXP S071 - ON
EXP S072 PWR - on (up)
EXP S072 START - OFF
EXP DATA - REAL TIME

PANEL 278

cb UPRT SYS COMPR (2) - open
cb DOCK RING SEP (2) - open

PANEL 300

RH SUIT FLOW vlv - FULL FLOW

PANEL 301

LH SUIT FLOW vlv - FULL FLOW

PANEL 302

CTR SUIT FLOW vlv - FULL FLOW

PANEL 303

PRIM CAB TEMP vlv - COLD (CW)
SEC CAB TEMP vlv - MAX COOL (CW)

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PANEL 304

DRNK H2O SUPPLY vlv - OFF (CW)

PANEL 305

FOOD PREP COLD H2O vlv - rel
FOOD PREP HOT H2O vlv - rel

PANEL 306

MSN TMR - START
EVNT TMR RSET - UP (ctr)
EVNT TMR STRT - ctr
EVNT TMR MIN - ctr
EVNT TMR SEC - ctr
MSN TMR HR - ctr
MSN TMR MIN - ctr
MSN TMR SEC - ctr

PANEL 325

CAB PRESS RELF vlv (RH) - BOOST/ENTRY
CAB PRESS RELF vlv (LH) - BOOST/ENTRY
PRIM GLY TO RAD vlv - BYPASS (pull)

PANEL 326

REPRESS PKG vlv - ON
SM O2 SUPPLY vlv - ON
SURGE TK O2 vlv - ON
GLY RSVR IN vlv - OPEN
GLY RSVR BYPASS vlv - CLOSE
GLY RSVR OUT vlv - OPEN

PANEL 350

CO2 CSTR DIVERT vlv - both (ctr)

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PANEL 351

MAIN REG vlv (2) - OPEN
H2O/GLY TK PRESS REG vlv - BOTH
H2O/GLY TK PRESS RELF vlv - BOTH
EMER CAB PRESS vlv - OFF
CAB REPRESS vlv - OFF (CCW)

PANEL 352

WASTE TK SERVICING vlv - CLOSE
PRESS RELF vlv - RELF
POT TK IN vlv - as req'd at closeout
WASTE TK IN vlv - AUTO

PANEL 375

SURGE TK PRESS RELF vlv - OPEN (CW)

PANEL 376

PLVC - NORMAL (up)

PANEL 377

GLY TO RAD SEC vlv - BYPASS (CCW)

PANEL 378

PRIM GLY ACCUM vlv - open (CCW)

PANEL 379

PRIM ACCUM FILL vlv - OFF (CW)

PANEL 380

02 DEMAND REG vlv - BOTH
SUIT TEST vlv - OFF
SUIT CKT RET vlv - CLOSE (push)

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PANEL 382

SUIT HT EXCH PRIM GLY vlv - FLOW (CCW)
SUIT FLOW RELF vlv - OFF
PRIM GLY EVAP IN TEMP vlv - MIN (CCW)
SUIT HT EXCH SEC GLY vlv - FLOW (CCW)
SEC EVAP H2O CONT vlv - AUTO (CW)
PRIM EVAP H2O CONT vlv - AUTO (CW)
H2O ACCUM vlv (2) - RMTE (CCW)

PANEL 399

AUX GLY EVAP IN TEMP vlv - MIN (CW)

PANEL 600

EMER O2 vlv - CLOSE

PANEL 601

REPRESS O2 vlv - CLOSE (guarded)

PANEL 602

REPRESS O2 RELF vlv - OPEN (CW)

PANEL 603

IVA STA O2 SUP - OFF

PANEL 604

IVA PWR - OFF

PANEL S015 (EXP)

40X CAMR - NORM

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FWD HATCH

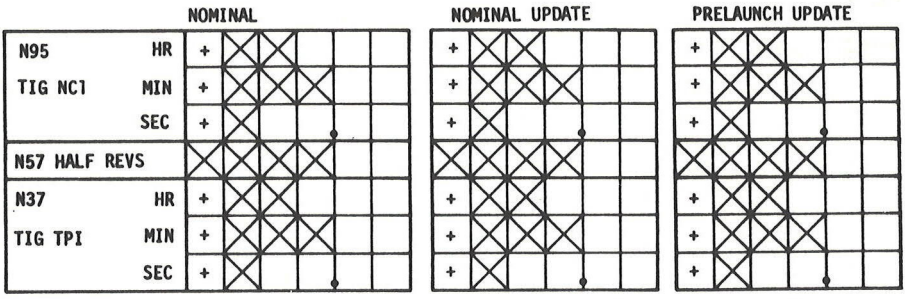
PRESS EQUAL vlv - CLOSE
ACTR HNDL sel - stow/check locked

SIDE HATCH

CAB PRESS DUMP vlv - CLOSE (CW)
GEAR BOX sel - LATCH
ACTR HANDLE sel - UNLATCH
LOCK PIN REL KNOB - LOCK
LOCK PIN ind - flush
GN2 VLV HANDLE - outboard
BPC JETT KNOB - toward BPC JETT

* - last momentary position before liftoff.

PRELAUNCH NC1 TARGETING PAD



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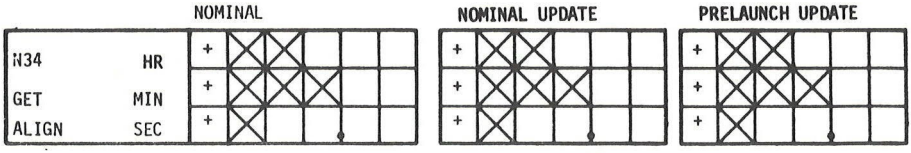
TALIGN PAD



BOOST_PREPARATION

-25:00 Change X STABLE MEMBER AZIMUTH, if necessary:

```
*V78E                          *
*F 06 29  X SM AZ (.01 DEG)*
*V21E                          *
*Load new Azimuth +0__.__  *
*PRO                           *
*ALIGN GDC                     *
```

AUTO RCS A/C ROLL (4) - OFF (verify)
AUTO RCS B/D ROLL B1 & B2 - MNA
AUTO RCS B/D ROLL D1 & D2 - MNB
AUTO RCS PITCH A3 & C4 - MNB
AUTO RCS PITCH C3 & A4 - MNA
AUTO RCS YAW B3 & D4 - MNA
AUTO RCS YAW D3 & B4 - MNB

-15:00 CTE UPDATE VERIFICATION
DC IND sel - BAT C
DC VOLTS ind - 35-37.5 vdc
DC IND sel - MNA
FDAI-1 total att R=90+AZ, P=90, Y=0
FDAI SCALE - 5/5
RATE - HIGH
TRANS CONTR PWR - on(up) (verify)
RHC PWR DIRECT(2) - MNA/MNB
CMC MODE - FREE
BMAG MODE (3) - RATE 1
RHC #2 - ARMED
ASTRO LAUNCH OPERATIONS VOICE CHECK
PLT S BD sw - OFF
CDR VHF AM sw - OFF
VOICE CHECK WITH MCCH
PLT S BD sw - T/R
CDR VHF AM sw - T/R
SPS THRUST - NORMAL (locked)
ΔV THRUST (2) - OFF

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EDS AUTO - on(up)
2 ENG OUT - AUTO
LV RATES - AUTO
RCS CMD - OFF
TVC SERVO PWR #1 - AC1/MNA
TVC SERVO PWR #2 - AC2/MNB

-10:00 FC REAC vlv - LATCH

-08:30 SEC COOL LOOP PUMP - off (ctr)(verify)

-04:10 L/V ENGINE lts (8) - on

-04:00 ASTRO LAUNCH OPERATIONS COMM CHECK

DSKY - Verify P02
V75 (Do not ENTR)
TAPE RCD FWD - FWD (tb-gray)

-2:15 PRIM GLY TO RAD - pull (bypass)

-1:15 MN BUS TIE (2) - on (up)
-1:00 PAD COMM (2) - OFF
VHF AM VOL tw - increase to above normal listening level
-00:45 GDC ALIGN pb - PUSH & HOLD
R=90+AZ, P=90, Y=0
FDAI 2 Total att - no motion
GDC ALIGN pb - release

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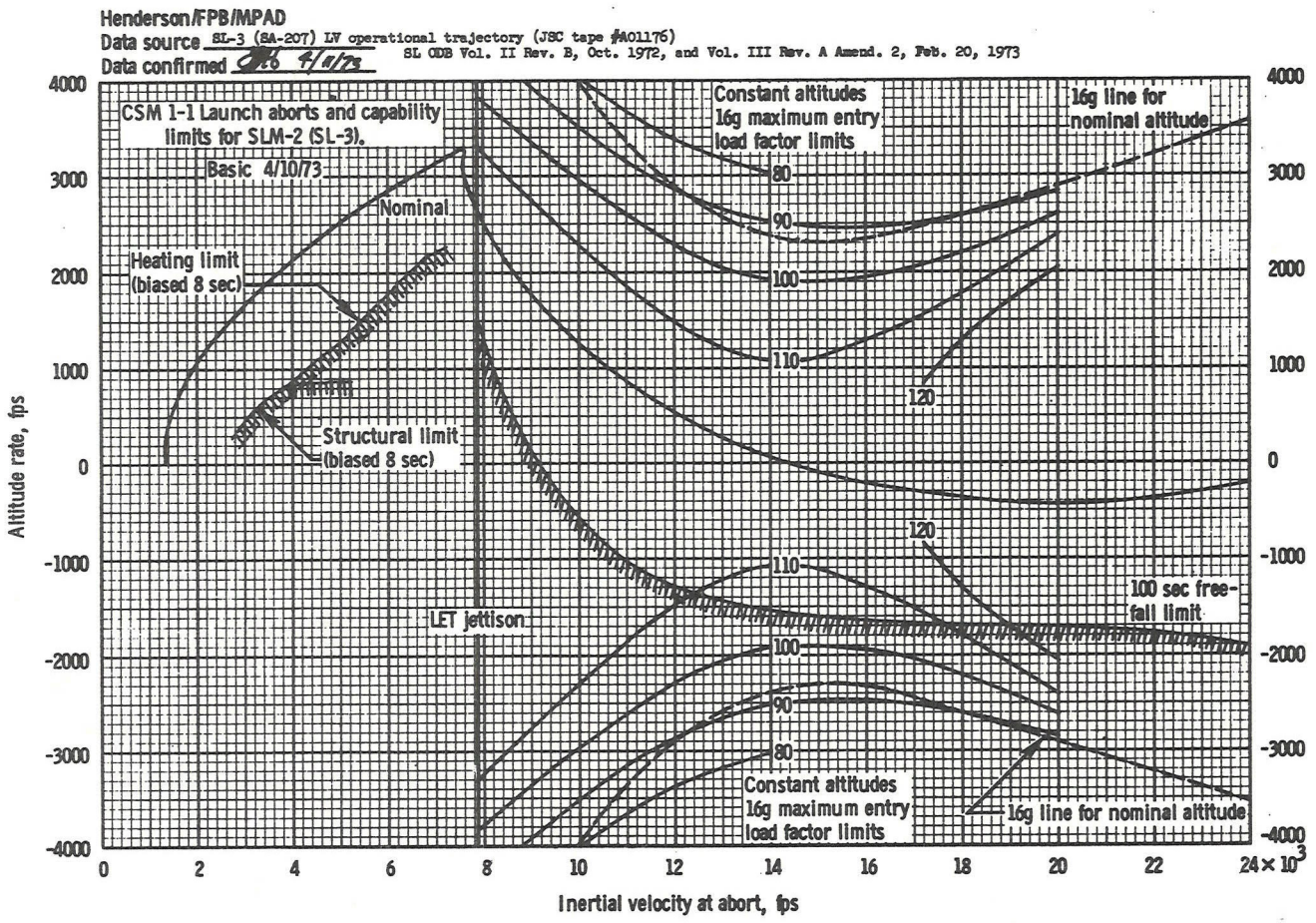


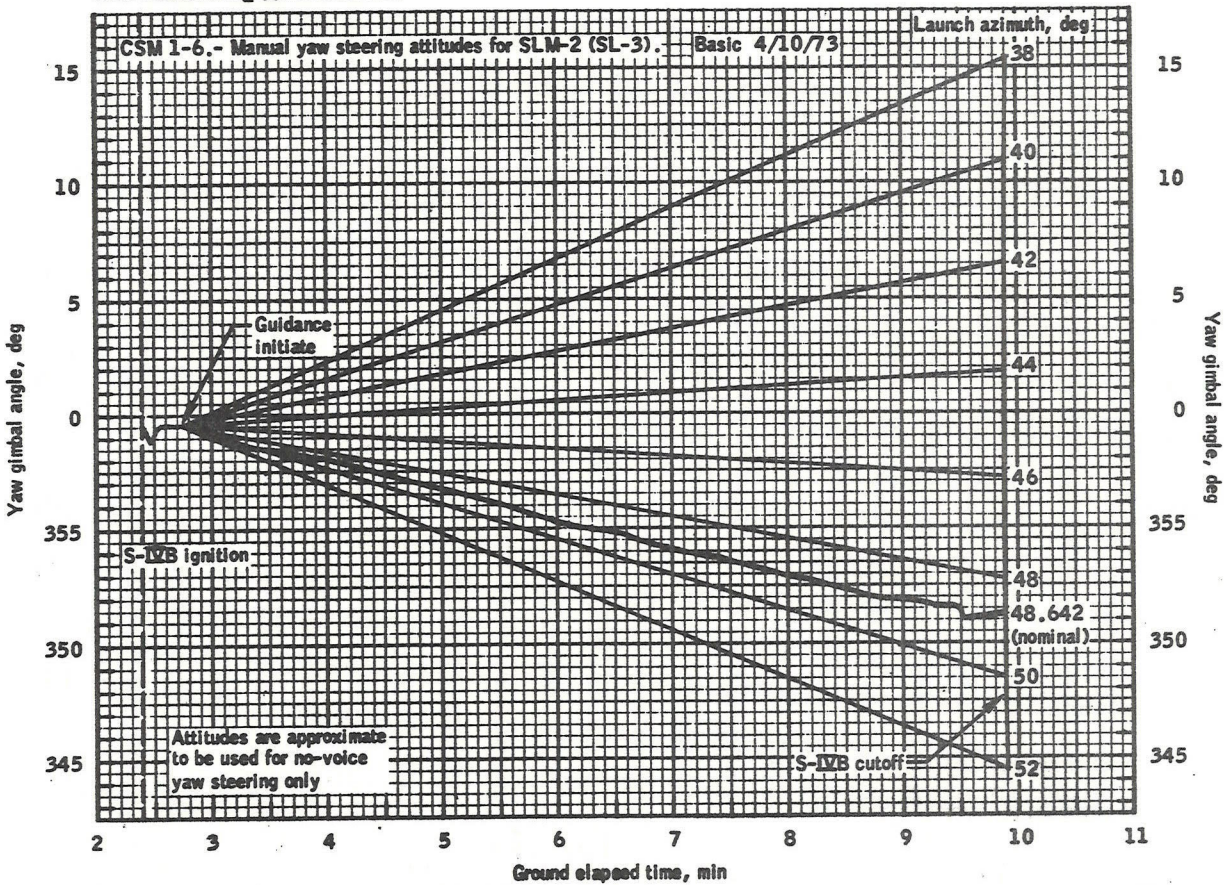
L
2-3

LAUNCH ABORT
LIMITS

YAW STEERING ATTITUDES

Henderson/FPB/MPAD
Data source MSFC SAE-AERO-MTP
Data confirmed [illegible] 6/11/73

SL-3 (SA-207) LV operational trajectory (JSC tape #A01176)



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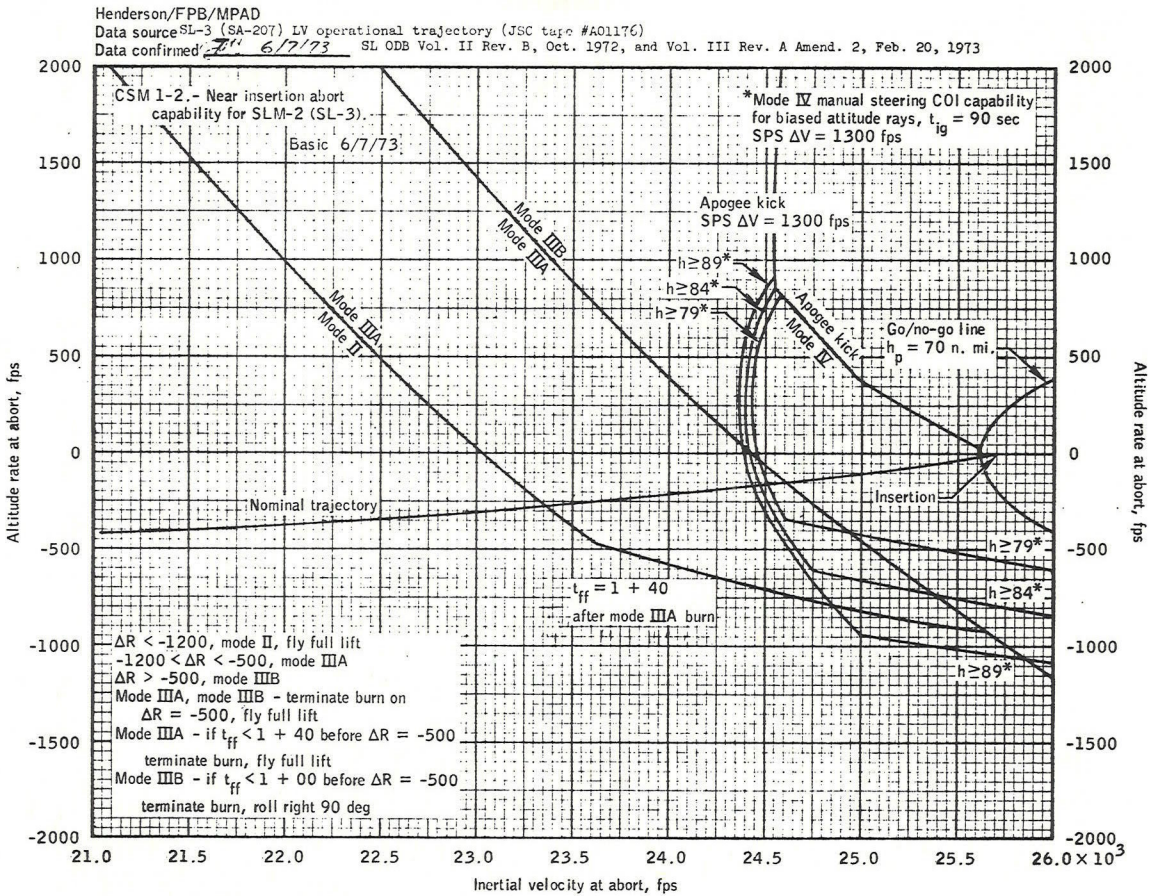

L
2-5

NEAR INSERTION
ABORT LIMITS

MANUAL STEERING CREW CHART (HP + HA = 208 nm)		
CURRENT ALTITUDE (H, nm)	HP/HA (nm)	INERTIAL VELOCITY (VI, fps)
70	70/138	25 810
72	72/136	25 790
74	74/134	25 780
76	76/132	25 760
78	78/130	25 750
80	80/128	25 740
82	82/126	25 720
84	84/124	25 710
86	86/122	25 690
88	88/120	25 680
90	90/118	25 660
92	92/116	25 650
94	94/114	25 630
96	96/112	25 620
98	98/110	25 600
100	100/108	25 590

NOTE: Assumes inserting at HDOT = 0.
S-IVB acceleration at insertion = ~89 ft/sec^2.
CSM acceleration at insertion = ~25 ft/sec^2.

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ALTITUDE vs VI

BOOST

-00:03 Ignition CMD
-00:01 L/V ENGINES Its (8) - out
00:00 LIFTOFF It - on

*After LIFTOFF verified: *
* If LIFTOFF It off: - push *
* If NO AUTO ABORT It on: - push*

Clock Start (auto) - report
MET Resets & counts up auto
P11 auto

*If no P11: - Key ENTR *
* Start DET & reset MET*

06 62 VI,H DOT, H PAD (fps,fps,.1nm)
If LV GUID It on:
* LV GUID - CMC *

+00:10 Roll & Pitch Program - report
If both LOX TK PRESS >50 psia:
* Abort immediately *

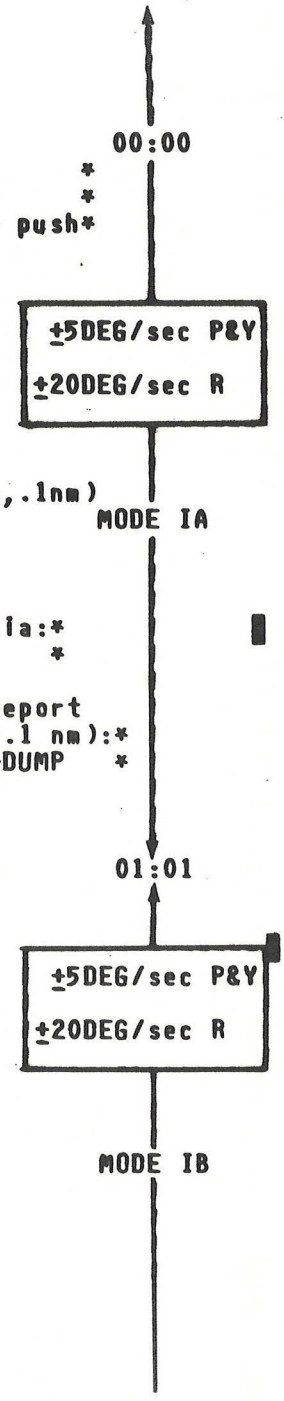
CABIN RELIEVING ~14K(2.3 nm) - report
If no Press decrease ~25K(4.1 nm):
* CAB PRESS RELIEF vlv(RH)-DUMP *

+00:56 Roll complete - report

+01:01 MODE IB - report
PRPLNT DUMP - RCS CMD

+01:13 MAX Q
V82E, N62E

+01:40 EDS AUTO - OFF - report
2 ENG OUT - OFF
LV RATES - OFF



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BOOST

+01:46 MODE IC - report

+02:11 CMC Boost Polynomial stops

GO/NO GO FOR STAGING - report

+02:17 INBOARD CUTOFF - (Its 5,6,7,8 on)
(LIFTOFF,NO AUTO ABORT Its out)
+02:20 OUTBOARD CUTOFF - report (Its on)
+02:22 SIB STAGING (Its out)
+02:23 SIVB Ign Command (It on)
+02:26 SIVB 65% (It out)

+02:49 TWR JETT (2) - on (up) (TFF>1+20)
(OECO + 30 sec)
NO TWR JETT, pg L/4-2
Twr Jett - report

V46E, V46E, N62E
MAN ATT PITCH - RATE CMD
GLY EVAP STEAM PRESS - AUTO
GLY EVAP H2O FLOW - AUTO
+02:55 Guidance Initiate - report
+03:25 Guidance Good
+04:00 Report Status
+05:00 Report Status
+06:00 Report Status
+06:15 OMNI ANT - C
+07:00 Report Status
GMBL MOT (4) - START - ON (PLT Confirm)
Check GPI:
LV/SPS IND - GPI (Momentarily)
PITCH = +1.1 DEG, YAW = +0.4 DEG

+07:48 PU SHIFT

H=16.5 nm

±5DEG/sec P&Y
±20DEG/sec R

+02:17

±10DEG/sec P&Y
±20DEG/sec R

MODE IC

TWR JETT

MODE II

±10DEG/sec P&Y
±20DEG/sec R

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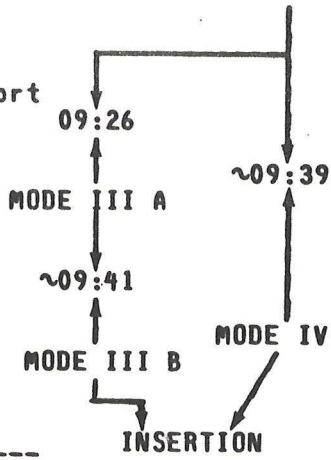
+08:00 Report Status
+09:00 GO/NO GO FOR ORBIT - report

+09:39 Mode IV - report
(VI ~ 24,478)
(H DOT ~ -169)
(H ~ 85.6)



+09:53 SECO (It on) - report _____

*If LV GUID - CMC: *
* THC - CCW *
* & neutral in 1 sec*

*If no SECO,(at VI): *
* THC - CCW *
* & neutral in 1 sec*

Log VI_____ (fps)
H DOT_____ (fps)
H PAD_____ (.1nm)

KEY RLSE

Log HA_____ (.1nm)
HP_____ (.1nm)
TFF_____ (min-sec)

PRO

V37E 00E

Verify LOX TK PRESS decreasing to ~32 psia
and FUEL TK PRESS decreasing
*If ΔP >36 psid (OXID > FUEL) or *
*If ΔP >26 psid (FUEL > OXID) or *
*If LOX or FUEL TK PRESS >50 psia: *
* EMERGENCY CSM/LV SEP, pg EMER/1-1*

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GMBL MTRS (4) - OFF (PLT confirm)
CM RCS LOGIC - OFF
cb ELS/CM-SM SEP (2) - open
cb FLT/PL VENT - open
MN BUS TIE (2) - OFF
CAB PRESS REL vlv (2) - NORMAL/LATCHED
PCM BIT RATE - LOW
VHF AM A - SIMPLEX
VHF AM B - OFF
S-BD AUX TAPE - TAPE

CSM/LV SEPARATION

Unstow HDC/CX10 (U1)
Settings: (f8,1/250,inf)

*If LV GUID - CMC: *
* Do not reload DAP *
* Mnvr to SEP ATT (180,309,0)*
Load RCS DAP
R1=11103, R2=01111
V46E
Load N22 (180,129,2), V62E
V49E F 06 22
SM RCS QUAD PRPLNT tb (8) - gray (verify)
RCS TRNFR - SM (verify)
AUTO RCS SELECT (16) - MNA/MNB
EMS FUNC - OFF
Set ΔVC to -100.0
EMS FUNC - ΔV
FDAI SCALE - 5/1
ATT DB - MIN/LOW
SC CONT - CMC
BMAG MODE (3) - RATE 2

GO/NO-GO for CSM/LV SEP
THC - ARMED
RHC #2 - ARMED (verify)
RCS CMD - ON
*If LV GUID - CMC: *
* Insure rates nulled *
* Load DAP 11103, 01111*
* V46E, V62E *

17:30 EMS MODE - NORMAL

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```
17:58 Thrust +X and hold
17:59 CMC MODE - AUTO
18:00 CSM/LV SEP pb - push, hold, and release
      LV TANK PRESS - full scale low
        *If No Separation:                          *
        *  THC - CCW (4 sec min)                    *
        *  DET reset and counting up (auto)         *
        *  LV TK PRESS - full scale low (SEP ind)*

~18:02 THC - release (ΔV=1.0 fps)
      SM RCS QUAD PRPLNT tb (8) - gray (verify)
      SM RCS QUAD He tb (4) - gray (verify)
      MAN ATT (PITCH) - ACCEL CMD
 18:12 Pitch up at 0.5 DEG/sec
      When Pitch error needle positive
        PRO,PRO
        MAN ATT (PITCH) - RATE CMD
      F 50 18 (completion of mnvr)
      ENTR
      Thrust +X (~3 sec) (ΔV=1.5 fps)
      Photograph SLA Panels (10 fr) & stop closing rate
      P30 (Load TIG=25:00, ΔVX=3.0 fps)
      P41 (Bypass Auto Mnvr)
 25:00 Null N85
```

POST_SEPARATION

```
SM RCS QUAD SEC FUEL PRESS (4) - OPEN
FC REAC vlv - NORM
AC ROLL (4) - OFF
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb SECS ARM (2) - open
EDS PWR - OFF
cb EDS (3) - open
THC & RHC - LOCKED
EMS - OFF/STBY
ATT DB - MIN/HIGH
THC PWR - OFF
RHC PWR DIRECT (2) - OFF
LV/SPS IND - GPI
TVC SERVO PWR (2) - OFF
cb RCS LOGIC (2) - open
```

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INSTALL COAS
SM RCS ENG PKG HTRS (4) - 1
SM RCS QUAD HTRS (4) - PRIM
SM RCS PSM 1 HTRS - PRIM
SPS HTRS - PRIM
C/W - NORMAL
BPC JETT KNOB - 180 DEG from BPC JETT
GN2 vlv HNDL - VENT (pull)
HATCH GEAR BOX - LATCH (verify)
ACTR HNDL SELECTOR - neutral

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SYSTEMS CHECKS

1 CONFIRM NORMAL SUIT AND CABIN PRESSURE

Verify cabin press >4.7 psia
and O2 flow not pegged hi
Cut two ropes on TO27 box nearest
Pnl 351 & move box
(351) EMERG CABIN PRESS vlv - BOTH
(380) SUIT CKT RET vlv - open (pull)
Remove helmets & gloves
Stow helmets in helmet bags (U2), gloves in accessory bags (U2) & put in PGA bag (U2)

2 STRUT UNLOCK LANYARD (2) - STOW
cb DIRECT ULLAGE (2) - open
(326) REPRESS PKG vlv - OFF
(304) DRINKING WATER SUPPLY vlv - ON (CCW)
(226) cb COAS/TUNL LTG MNB - close
Unstow Tool E (L2)

3 OPTICS DUST COVER JETTISON

Install Optics eyepieces
G/N PWR OPTICS - on (up)
OPT ZERO - OFF, then ZERO (15 sec)
OPT ZERO - OFF
OPT MODE - MAN
OPT COUPLING CONT - DIRECT
OPT SPEED CONT - HI
OHC - MAX RIGHT (Obs eject thru SCT)
(SXT 40 DEG, SCT 150 DEG shaft angle)

4 CDR & SPT go to Rendezvous book
PLT continue with Systems Checks

NOTE: The following steps must be performed prior to NC1 and may be rearranged as req'd for each mission.

5 MAIN REG CHECK

(351) MAIN REG B vlv - close
EMER CABIN PRESS sel - 1
PUSH TO TEST PB - PUSH (O2 FLOW INC)
MAIN REG B vlv - open
MAIN REG A vlv - close
EMER CABIN PRESS sel - 2
PUSH TO TEST PB - PUSH (O2 FLOW INC)
MAIN REG A vlv - open
EMER CABIN PRESS sel - BOTH

6 SEC RAD LEAK CHECK

Monitor SEC ACCUM QUANTITY - no change
(377) SEC GLY To RAD vlv - NORM (CW) for 30 sec,
then BYPASS (CDR)

7 ECS POST INSERTION CONFIG

(Must be performed between +20:00m & +55:00m)
(326) GLY RSVR BYPASS vlv - OPEN (CCW)
GLY RSVR OUT vlv - CLOSE (CW)
GLY RSVR IN vlv - CLOSE (CW)
PRIM GLY ACCUM QTY 30-65%
(379) PRIM ACCUM FILL vlv - ON (CCW) until 40-55%
ECS RAD FLOW CONT - PWR
PRIM GLY TO RAD vlv - NORMAL (push)
ECS RAD HTR - PRIM 1
ECS RAD TEMP PRIM OUT below PRIM IN
After 5 min, if outlet temp > inlet:
* PRIM GLY TO RAD vlv - BYPASS(pull)*
* Recheck in 10 min *
ECS RAD tb - gray
GLY EVAP TEMP IN - AUTO
POT H2O HTR - MNA
cb H2O/URINE DUMP HTR (2) - close

8 SM RCS MONITORING CHECK

SM RCS PSM 1 He tb - bp
SM RCS PSM 1 MANF ISOL tb - gray
SM RCS QUAD He (4) tb - gray
SM RCS PSM PRPLNT (4) tb - bp
SM RCS QUAD PRPLNT (8) tb - gray
RCS IND sel - SM QUAD A, B, C, D, PSM 1
PKG TEMP - 115-175 DEG F (PSM - zero)
He TK PRESS - 4100-4200 psia (PSM: 4100-4200)
FUEL TK PRESS - 178-192 psia (PSM: 130-150)
RCS IND sw - MANF PRESS
FUEL MANF PRESS - 130-150 psia
OXID MANF PRESS - 150-170 psia

9 CM RCS MONITORING CHECK

CM RCS PRPLNT tb (2) - gray
RCS IND sw - CM 1,2
He TEMP - 60-80 DEG F
He PRESS - 4100-4200 psia
MANF PRESS - 80-105 psia

10 C/W OPERATIONAL CHECK

C/W LAMP TEST - 1 (LH MA & 18 lts)
C/W LAMP TEST - 2 (RH MA & 17 lts)
C/W CSM - CM (CM RCS lt (2) - on)
C/W CSM - CSM (CM RCS lt (2) - out)
C/W MEMORY - RESET

11 EPS MONITORING CHECK

Cryogenic Pressure - Quantity Check
H2 PRESS (2) - 225-260 psia
02 PRESS (2) - 865-935 psia
SURGE TK PRESS - 865-935 psia
H2 FANS (2) - AUTO (verify)

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FC Power Plant Check
FC HTRS(2) - on(up)
FC REAC tb (2) - gray
H2 VENT tb - gray
FC IND sel - 1, 3
H2 FLOW - 0.03-0.15 lb/hr
02 FLOW - 0.25-1.2 lb/hr
MOD SKIN TEMP - 390-440 DEG F
MOD COND EXH TEMP - 150-175 DEG F
FC pH HI tb - gray
D-C Voltage-Amperage Check
MN BUS TIE (2) - OFF (verify)
SM PWR SOURCE MNA tb - 1 gray, 2 & 3 bp
SM PWR SOURCE MNB tb - 1 & 2 bp, 3 gray
CSM/SWS INTERFACE PWR tb - gray
SM SOURCE 1 & 3 (check amps)
MAIN BUS A, B, (26.5-31 vdc)
BAT BUS A, B, & BAT C (31.5-38 vdc < 3 amp)
PYRO BAT A, B (36.5 - 37.5 vdc)
DC IND sel - MNB
SYS TEST 3B (BAT RLY BUS - 3.4-4.1 vdc)

A-C Volts - 113-117 all phases

12 ECS MONITORING CHECK

SUIT COMP ΔP - .3-.4 psid
02 SURGE TANK PRESS - 865-935 psia
REPRESS 02 >865 psia
PRIM RAD tb - gray
*If PRIM RAD tb - 2: *
* ECS RAD FLOW AUTO CONT - 1 until*
* tb gray, then AUTO
ECS RAD TEMP PRIM IN - 67-97 DEG F
ECS RAD TEMP PRIM OUT - -12 to +65 DEG F
PRIM GLY EVAP TEMP OUT - 38-50.5 DEG F
PRIM GLY DISCH PRESS - 40-52 psig
SUIT TEMP - 45-55DEG F
SUIT PRESS/CABIN PRESS - 4.7-5.3 psia
PART PRESS C02 < 7.6 mm Hg
POT H20 QTY - 10-50%
WASTE H20 QTY - 10-50%

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13 SECONDARY GLYCOL LOOP CHECK

ECS IND sw - SEC
SEC COOL LOOP PUMP - AC1
  GLY DISCH SEC PRESS - 39-51 psig
  ACCUM SEC QTY IND - 30-60%
SEC EVAP H2O FLOW - AUTO
SEC COOL LOOP - EVAP
After 5 min:
  SEC EVAP TEMP OUT - 38-50.5 DEG F
SEC COOL LOOP EVAP - RSET 1 min, off (ctr)
SEC EVAP H2O FLOW - off (ctr)
SEC COOL LOOP PUMP - off (ctr)
ECS IND sw - PRIM

14 SPS MONITORING CHECK

SPS TEMP ind sw - He PNL,OXID LN (45-85 DEG F)
SPS PRESS IND sw - He, N2A & N2B
  SPS PRESS ind -
    He 3750 psia max
    N2A 2900 psia max
    N2B 2900 psia max
SPS PRESS IND sw - He
FUEL & OXID PRESS ind - 170 to 195 psia
SPS ENG INJ VLVS (4) - CLOSE
SPS He VLV (1&2) - AUTO, tb - bp

15 EXTEND DOCKING PROBE

cb DOCK PROBE (2) - close (verify)
DOCK PROBE EXTD/REL - EXTD/REL until
  full probe extension
(DOCK PROBE tb - gray at full extension)

	EXT	RET
FULL EXT	Gray	Gray
FULL RET	BP	BP
PART EXT	BP	Gray

DOCK PROBE EXTD/REL - RETRACT (tb-gray)

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16 PGA DOFFING AND STOWAGE PROCEDURE

Snap 2 TSB's (U1) on aft BKH & UEB
Stow life vests (F1)
Stow wrist dams & neck dams (F2)
Stow C/L pockets (F2)
Stow scissors, sunglasses, PRD's, suit pocket equip., watches & bands (top pocket-TSB)
Stow comfort gloves & wristlets (ACC. BAGS)
Unstow O2 umbilical screen caps (B2)
Configure CCU & O2 umbilicals (pg S/1-7, step 6)
Stow CCA (ACC. BAGS)

Doff PGA's (pg S/1-7, step 6)
Install helmets & IV gloves (PGA BAG) on PGA's
Connect electrical dust covers (B2) to PGA's
Stow PGA's (under couches)

Doff UCTA's (when full)
Place UCTA clamps (A6) on UCTA's
Stow UCTA's (TSB on UEB)
Don UCTA's (A6)
Stow OBS/Biobelts (ACC. BAGS)
Don CWG harnesses & lt wt headsets (U2)
Don trousers, jackets & boots (U2)
Unstow CUE CARDS (DATA CARD KIT-R1)

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ABORT PROCEDURES

MODE IA ABORT

(00:00 to 01:01)

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

00:14 ELS - AUTO

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/4-11

MODE IB ABORT

(01:01 to 16.5 nm)

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

00:11 *CANARD DEPLOY PB - PUSH*

00:14 ELS - AUTO

ELS LOGIC - on (up)
RCS CMD - ON

Go to LANDING PHASE pg L/4-11

MODE IC ABORT

(16.5 nm to TWR JETT)

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

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

S/C PLATFORM GO/NO GO
KEY RLSE to N44, Check HA

HA>32nm & PLAT GO	HA<32nm or PLAT NO GO
TWR JETT sw(2)-on(up)	Cmd +5DEG/sec Pitch rate
MAN PITCH - RATE CMD	
BMAG (3)- ATT1/RATE 2	*If +Pitch rate too hi:*
ENT ATT R=0,P=135,Y=0	* Roll 90 DEG *
EMS FUNC - ENTRY	* Damp rate with yaw *
EMS MODE - NORMAL	* Roll to HDS DN *
At .05G Lt,	
.05G sw - on (up)	
EMS ROLL - on (up)	
Fly Max Lift	

P (.05G)_____
GET DRO _____

Go to LANDING PHASE pg L/4-11

LET FAILS TO JETTISON

LEGS CUT/NO MOTOR FIRE (pyro audible):
LES MOTOR FIRE PB - PUSH
NO RESPONSE to 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)
TWR JETT (2) - on (up)
NO TWR JETT: TWR JETT (2) - AUTO
Abort, Mode IC on STDN cue

MODE II RCS ABORT

(TWR JETT to MODE III)

00:00 THC - 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 THC - NEUTRAL, Damp rates, then +X
Check SM RCS talkbacks

00:24 THC - +X OFF
BMAG MODE (3) - ATT1/RATE 2
KEY RLSE to N44, Check TFF
If TFF >2 min:
YAW 45 DEG (RIGHT) 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
Entry ATT - (R=0,P=130,Y=0)(Compl by 1:40)
cb DOCK RING SEP (2) - close (pull lanyard)
DOCK RING SEP (2) - on (up)
EMS FUNC - ENTRY
EMS MODE - NORMAL

GET 300K_____
P (.05G)_____
GET DRO _____

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/4-11

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MODE II, MODE IIIA

MODE IIIA SPS ABORT (Burn STDN Pad)

(ΔR = -1150nm to ΔR = -500nm)

00:00 THC - 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 THC - NEUTRAL, Damp rates, then +X
Check SM RCS talkbacks

00:24 THC - +X OFF
N50E ΔR, HP,TFF (.1nm, min-sec)
BMAG MODE (3) - ATT1/RATE2
MNVR to Burn att (R=180,P=355,Y=0)
(Scribe on horiz, SEF, Hds dn)
EMS MODE - NORMAL
RATE - LOW
LV/SPS IND - GPI

ΔV THRUST A - NORMAL
01:50 THC - +X (15 sec)
02:05 THRUST ON PB - PUSH
Burn to VC (ΔR = -500)
or TFF = 1+40
ΔV THRUST (2) - OFF

TIG _____
(1999.9)
ΔV_____
CUTOFF_____
BT_____
P(IGN)_____
GET 300K_____
P (.05G)_____
GET DRO _____

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RATE - HIGH
If TFF >2 min:
YAW 45 DEG (RIGHT) 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,P=115,Y=0)
(BEF, Hds Dn, Full Lift)
cb DOCK RING SEP (2) - close (pull lanyard)
DOCK RING SEP (2) - on (up)

Note TFF
EMS MODE - STBY
EMS FUNC - ENTRY
EMS MODE - NORMAL
At .05G lt - on
.05G sw - on (up)
EMS ROLL - on (up)
Fly Max Lift

Go to LANDING PHASE, pg L/4-11

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MODE IIIB

MODE IIIB SPS ABORT (Burn STDN Pad)

(ΔR= -500 nm to INSERTION)

00:00 THC - 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 THC - NEUTRAL, Damp rates, then +X
Check SM RCS talkbacks

00:24 THC - +X OFF
N50E ΔR,HP,TFF (.1nm,min-sec)
BMAG MODE (3) - ATT1/RATE2
If ΔR>-500:
MNVR to retro att (R=180,P=198,Y=0)
(Scribe on horiz, BEF, Hds up)
EMS MODE - NORMAL
RATE - LOW
LV/SPS IND - GPI

ΔV THRUST A - NORMAL
01:50 THC - +X (15 sec)
02:05 THRUST ON PB - PUSH
Burn to VC (ΔR=-500)
or TFF = 1+00
ΔV THRUST (2) - OFF

TIG _____
(1999.9)
ΔV _____
CUTOFF _____
BT _____
P(IGN) _____
GET 300K _____
P (.05G) _____
GET DRO _____

RATE - HIGH
If TFF >2 min:
YAW 45 DEG (RIGHT) 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,P=115,Y=0)
(BEF, Hds Dn, Full Lift)
cb DOCK RING SEP (2) - close (pull lanyard)
DOCK RING SEP (2) - on (up)

```
Note TFF
EMS MODE - STBY
EMS FUNC - ENTRY
EMS MODE - NORMAL
At .05G lt - on
  .05G sw - on (up)
  EMS ROLL - on (up)
Fly Max Lift
  *If TFF C/O before ΔR=-500:                *
  *  At .2G, Roll right 90 DEG (LV north)*
```

Go to LANDING PHASE pg L/4-11

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MODE IV SPS TO ORBIT (Burn CMC)

(VI ~ 24,478, HDOT ~ -169, H ~ 85.6)

00:00 THC - 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 THC - NEUTRAL, Damp rates, then +X
Check SM RCS talkbacks

00:24 THC - +X OFF

Perform PITCH PROFILE or FIXED ATTITUDE BURN:

(-HDOT,Burn ASAP)
PITCH PROFILE (+HDOT,Burn at 90 sec)

BMAG MODE (3) - ATT1/RATE2
Mnvr to Chart Burn Attitude
EMS MODE - NORMAL
RATE - LOW
LV/SPS IND - GPI
ΔV THRUST A - NORMAL
THC - +X (15 sec)
≤01:30 THRUST ON PB - PUSH
SCS TVC (PITCH) - RATE CMD
Fly HDOT to zero (±100 fps), trim YAW with tw

Burn to chart VI, pg L/2-6

*If unable to fly HDOT to <|100|: *
* KEY RLSE to N44 *
* (-HDOT) Burn HP >70nm +4 sec *
* (+HDOT) Burn HA >200nm, then Apogee Kick*

ΔV THRUST (2) - OFF
EMS MODE - STBY

Go to 'Log VI', pg L/4-10

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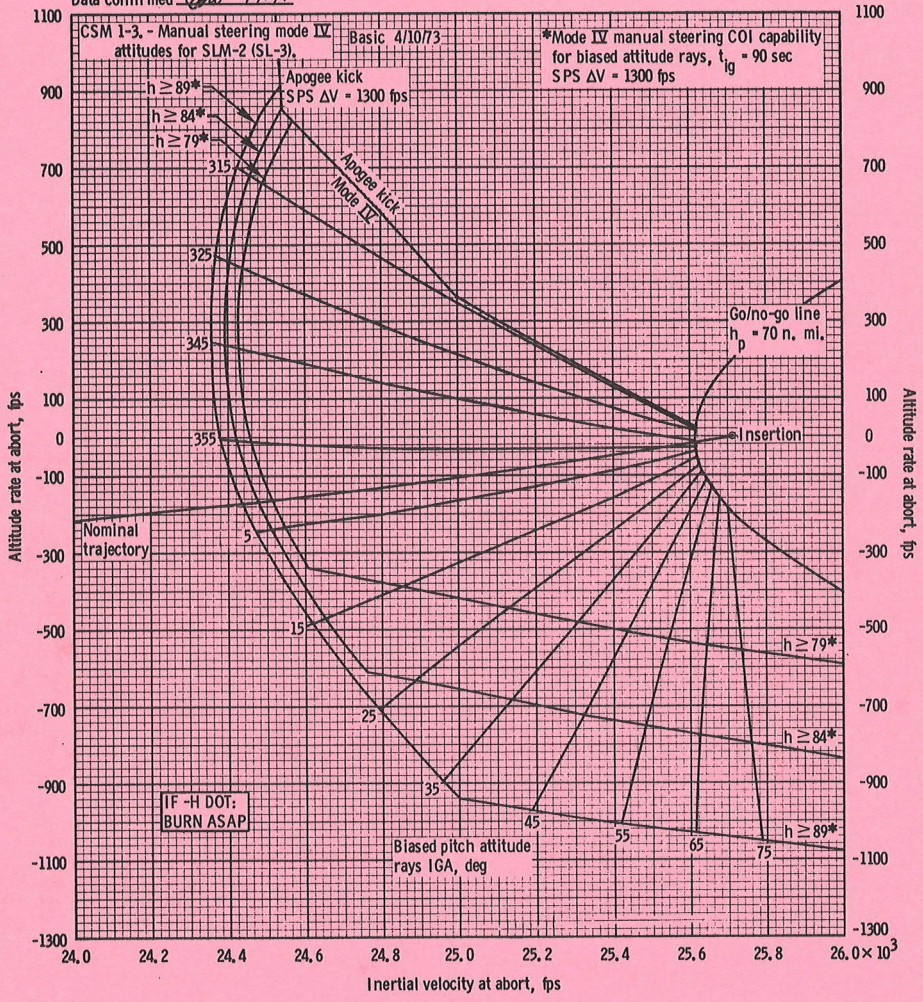
MODE IV IGN ATT

Henderson/FPB/MPAD
Data source SL-3 (SA-207) LV operational trajectory (JSC tape #A01176)
Data confirmed [signature] 4/11/73 SL ODB Vol. II Rev. B, Oct. 1972, and Vol. III Rev. A Amend. 2, Feb. 20, 1973



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

BMAG MODE (3) - ATT1/RATE2
EMS MODE - NORMAL
RATE - LOW
LV SPS IND - GPI
ΔV THRUST A - NORMAL
01:50 THC - +X (15 sec)
02:05 THRUST ON PB - PUSH
BURN to VC
ΔV THRUST (2) - OFF
EMS MODE - STBY

TIG _____
1999.9
ΔV _____
CUTOFF _____
BT _____
P(IGN) _____

Log VI_____ (fps)
H DOT_____ (fps)
H PAD_____ (.1nm)
KEY RLSE

Log HA_____ (.1nm)
HP_____ (.1nm)
TFF_____ (min-sec)
PRO

V37E 00E
Load DAP, V48: R1=11102, R2=01111
V46E

GMBL MTRS (4) - OFF (PLT confirm)
CM RCS LOGIC - OFF
cb ELS/CM-SM SEP (2) - open
cb FLT/PL VENT - open
MN BUS TIE (2) - OFF
CAB PRESS REL vlv (2) - NORMAL/LATCHED
PCM BIT RATE - LOW
BMAG MODE (3) - RATE 2
SC CONT - CMC/AUTO
VHF AM A - SIMPLEX
VHF AM B - OFF
S-BD AUX TAPE - TAPE

Go to POST SEPARATION, pg L/2-11

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 (DIRECT RCS)*
46 sec * 5K' MAIN DPLY PB - PUSH *
* ELS - AUTO *

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

CM RCS PRPLNT (2) - OFF

10K' Main parachutes deployed (Cab Press=10 psia)
MAIN DEPLOY PB - PUSH
VHF ANT - RECY
VHF AM A - SIMPLEX
VHF BCN - ON

If No Comm and abort occurred between
* 1:01 & 2:00 min or if land impact *
* expected: *
* Perform CM RCS DUMP, pg L/4-12 *

CABIN PRESS REL vlv (RH) - DUMP
STRUT LOCKS (4) - UNLOCK
(5) cb FLT & PL BAT BUS A,B,&BAT C (3) - close
cb FLT & PL MNA & B (2) - open
cb BAT RLY BUS (2) - open
(8) cb SPS P&Y (4) - open

ELS - AUTO (verify)
ELS LOGIC - on (up) (verify)
FLOOD Lts - POST LDG

800' CAB PRESS REL vlv (2) - CLOSE (latch off)
DIRECT O2 vlv - OPEN (CCW)
MN BUS TIE (2) - OFF

Go to POST LANDING PROCEDURES, pg L/4-13

CM RCS DUMP; if req'd (land landing)

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

POST LANDING PROCEDURES

(229) cb MAIN REL PYRO (2) - close
MAIN RELEASE - on (up)
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
If no contact with recovery forces:
* VHF AM A&B - off (ctr) *
* VHF AM RCV ONLY - A *
(8) cb PL VENT - close
cb FLOAT BAG (3) - close
(278) cb UPRIGHT SYS COMPRESS (2) - close
If Stable II:
FLOAT BAG (3) - FILL till 2 min after upright, then - OFF
VHF AM A/B & BCN - OFF while inverted
If Stable I:
After 10 Min Cooling Period,
FLOAT BAG (3) - FILL 7 min, THEN OFF

POST STABILIZATION AND VENTILATION

PL BCN LT - BCN LT LO (night landing)
PL VENT vlv - UNLOCK (Pull into detent)
Remove PL VENT Exh Cover
PL VENT - HIGH or LOW

If dye marker req'd:
PL DYE MARKER - ON
Release restraints
(275) cb MNA BAT BUS A & BAT C (2) - open
cb MNB BAT BUS B & BAT C (2) - open
(5) cb FLT & PL BUS BAT C - open
(229) cb PYRO BUS A PYRO BAT A - open
cb PYRO BUS B PYRO BAT B - open
Verify voltage $\geq$ 27.5 vdc

*If < 27.5 vdc:
* cb FLT & PL BUS BAT C (1) - close *
* cb FLT & PL BUS BAT A&B (2) - open*
* Go to LOW POWER CHECKLIST *
Unstow and install PLV DISTRIB DUCT (3)
Deploy grappling hook and line if req'd

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POST_LANDING_COMMUNICATIONS

```
VHF ANT RECV (verify)
VHF BCN - ON (verify)
  *If no contact with recovery forces:*
  *  Perform VHF BEACON Check          *
MONITOR VHF BEACON transmission with
  VHF AM B Rcvr and/or Survival Trncvr (VOICE)
    *If VHF Beacon not operating:                *
    *  Connect Survival Trncvr cable conn        *
    *  J1 to bcn ant cable conn P112 behind VHF*
    *  ant access pnl and place radio in BCN     *
    *  mode                                      *
```

LOW_POWER_CHECKLIST (If req'd)

```
VHF BCN - OFF
VHF AM (3) - RCV
FLOOD LTS - OFF
VHF AM A&B - off (ctr)
VHF AM RCV ONLY - A (verify)
POSTLANDING VENT SYS: minimize use
SURV RADIO - plug into VHF BCN ANT cable
  conn P112 behind VHF ant access pnl & turn
  radio on in BCN mode
    *If BAT C <27.5 vdc:                  *
    *  cb BAT BUS A BAT A - open          *
    *  cb BAT BUS A PYRO BAT A - close*
    *  cb FLT/PL BUS BAT A - close        *
    *  cb FLT/PL BUS BAT C - open         *
    *  Monitor PYRO BAT A voltage         *
    *    on BAT BUS A                     *

    *If PYRO BAT A <27.5 vdc:              *
    *  cb BAT BUS B BAT B - open          *
    *  cb BAT BUS B PYRO BAT B - close*
    *  cb FLT/PL BUS BAT B - close        *
    *  cb FLT/PL BUS BAT A - open         *
    *  Monitor PYRO BAT B voltage         *
    *    on BAT BUS B                     *
```

NOMINAL EGRESS & POWER DOWN

(15) PL VENT - OFF
PL BCN LT - LOW (verify)
cb BAT CHRG BAT C/EDS 2 (1) - open
(6,9,10) VHF AM (3) - OFF
VHF AM A (B) - OFF (ctr)
VHF BCN - ON (verify)
Charge hatch counterbalance
Open side hatch (after collar installed)
ACTR HNDL SEL - N
GN2 vlv HNDL - VENT (pull)
GN2 vlv HNDL - PRESS (push)
Check Pressure Gauge (mid-white)
Repeat vent/press to obtain mid-white

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UNAIDED EGRESS PROCEDURES

*If no ventilation or CM O2 supply: *
* If Stable I, open side hatch as req'd *
* If Stable II, initiate egress within 2.5 hrs*

PREPARATION
Disconnect umbilicals
(F2) Neck dams on (if suited)
Configure couch(es) - 270 DEG
Armrests stowed
(R4) Unstow rucksacks #1 & #2
Connect lanyards
(yellow to rucksack, green to S/C, white to crew, in order of egress printed on lanyards)

STABLE I
(15) PL VENT - OFF
(5) cb FLT/PL BUS BAT C (1) - open (verify)
cb BAT CHRG BAT C/EDS 2 (1) - open
cb PANEL 275 (all) - open
Charge hatch counterbalance
Open side hatch
ACTR HNDL SEL - N
GN2 vlv HNDL - VENT (pull)
GN2 vlv HNDL - PRESS (push)
Check pressure gauge (mid-white)
Repeat vent/press to obtain mid-white
Remove raft from rucksack #2
Put raft overboard & pull inflation lanyard
Pass hardware kit to raft
Egress, inflate life vest, board raft

STABLE II
(6,9,10) PWR (3) - OFF
SUIT PWR (3) - OFF
Review hatch handle location and hatch unlocking procedure
PRESS EQUAL vlv - OPEN
Remove and stow tunnel hatch on underside of CDR's couch
Lower hardware rucksack down tunnel
Exit feet first; when clear of S/C inflate water wings
Remove life raft from rucksack #2 and inflate

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EMERGENCY PROCEDURES

(Flight copies only)

(See CSM SYSTEMS CHECKLIST)

(See CSM SYSTEMS CHECKLIST)