

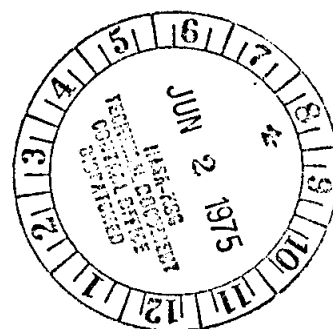
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JSC-09148

ASTP

FINAL

ENTRY CHECKLIST



**PREPARED BY
PROCEDURES BRANCH
CREW TRAINING & PROCEDURES DIVISION**



National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
Houston, Texas

MAY 9, 1975

ASTP
ASTP ENTRY CHECKLIST
MAY 9, 1975

JSC-09148
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CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT ENTRY CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
001	REFERENCE	2/7/75	
002	REFERENCE	2/7/75	
003	REFERENCE	2/7/75	
004	REFERENCE	2/7/75	
005	REFERENCE	2/7/75	
006	REFERENCE	2/7/75	
007	REFERENCE	2/7/75	
008	REFERENCE	2/7/75	
009	REFERENCE	2/7/75	
010	REFERENCE	2/7/75	
011	REFERENCE	2/7/75	
012	REFERENCE	2/7/75	
013	REFERENCE	2/7/75	
014	REFERENCE	2/7/75	
015	REFERENCE	2/7/75	
016	REFERENCE	2/7/75	
017	REFERENCE	2/7/75	
018			WITHDRAWN
019	REFERENCE	2/7/75	
020	REFERENCE	2/7/75	

CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT ENTRY CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
021	REFERENCE	2/7/75	
022	REFERENCE	2/7/75	
023	REFERENCE	2/7/75	
024	FINAL	5/9/75	
025	REFERENCE	2/7/75	
026	REFERENCE	2/7/75	
027	REFERENCE	2/7/75	
028	REFERENCE	2/7/75	
029	REFERENCE	2/7/75	
030	REFERENCE	2/7/75	
031	REFERENCE	2/7/75	
032	REFERENCE	2/7/75	
033	REFERENCE	2/7/75	
034	REFERENCE	2/7/75	
035	FINAL	5/9/75	
036	FINAL	5/9/75	
037	FINAL	5/9/75	
038	FINAL	5/9/75	
039	FINAL	5/9/75	
040	FINAL	5/9/75	

CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT ENTRY CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
041	FINAL	5/9/75	
042	FINAL	5/9/75	
043	FINAL	5/9/75	
044	FINAL	5/9/75	
045	FINAL	5/9/75	
046	FINAL	5/9/75	
047	FINAL	5/9/75	
048	FINAL	5/9/75	
049	FINAL	5/9/75	
050	FINAL	5/9/75	
051	FINAL	5/9/75	
052	FINAL	5/9/75	
053	FINAL	5/9/75	
054	FINAL	5/9/75	
055	FINAL	5/9/75	
056	FINAL	5/9/75	
057	FINAL	5/9/75	
058	FINAL	5/9/75	
059			DISAPPROVED
060			DISAPPROVED

CHANGE CONTROL RECORD

APOLLO/SOYUZ TEST PROJECT ENTRY CHECKLIST

CONTROL NO.	FDF EDITION INCORPORATED		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
061	FINAL	5/9/75	

ASTP ENTRY CHECKLIST

LIST OF EFFECTIVE PAGES

BASIC 10/15/74
REFERENCE 2/7/75
FINAL 5/9/75

PAGE	DATE
i	5/9/75
ii	5/9/75
iii	5/9/75
1-1	5/9/75
1-2	5/9/75
1-3	5/9/75
1-4	5/9/75
1-5	5/9/75
1-6	5/9/75
1-7	5/9/75
2-1	5/9/75
2-2	5/9/75
3-1	5/9/75
3-2	5/9/75
3-3	5/9/75
3-4	5/9/75
3-5	5/9/75
4-1	5/9/75
4-2	5/9/75
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5-2	5/9/75
5-3	5/9/75
6-1	5/9/75
6-2	5/9/75
6-3	5/9/75
6-4	5/9/75
6-5	5/9/75
7-1	5/9/75
7-2	5/9/75
7-3	5/9/75
7-4	5/9/75
7-5	5/9/75
7-6	5/9/75
7-7	5/9/75
7-8	5/9/75
8-1	5/9/75

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CONTENTS

NORMAL PROCEDURES		PAGE
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97+00-

11001
01111

P52 (OPT 1) (36, 37, 40) (RECORD)
P00

11112--
01111

V48E, LOAD 4 JET X TRANS, 5 DEG DBD, .5 DEG/SEC
V49E, MNVR TO DEORBIT BURN ATT (0, 180, 0)

00:00-

97+10-

START SCS DRIFT CK (BMAG 2)
ALIGN GDC
RESET AND START DET COUNTING UP

V
A
N

STDN UPLINK, UPDATE
P27 (SV, SPS TARGET LOAD, ENTRY TARGET LOAD)
PRELIMINARY DEORBIT BURN PAD (COPY PG E/1-6)
PRELIMINARY ENTRY PAD (COPY PG E/1-7)

97+20-

97+30-

P52 (OPT 1)

N71 1ST STAR	XX	0	0	0		
N71 2ND STAR	XX	0	0	0		
N05(R1) ANG ERR	XX					
TIME OF	HR	+	0	0	0	
GYRO	MIN	+	0	0	0	
TORQUE	SEC	+	0		0	0

E/1-1

DATE 5/9/75

DEORBIT SEQ

97+30-

11112 -
01111G
D
S

LOGIC SEQUENCER CK

30:00-

97+40-

00:00-

END SCS DRIFT CK (BMAG 2)

PERFORM GDC/IMU COMPARISON CK LIST

IF BMAG 2 > 10 DEG/HR/AXIS * * * *
 *START SCS DRIFT CK (BMAG 1) *
 * ALIGN GDC *
 * BMAG MODE (3) - RATE 1 *
 * RESET AND START DET COUNTING UP*
 * * * * *

S
P
1N
F
L

ACQUIRE ATS HGA: MAN, WIDE P -25, Y 4
 S-BD ANT IND > 1/3 SCALE, HGA: REACQ, NARROW

97+50-

M
A
D

UNSTOW AND DON LIFE VESTS (F1)
 AND HEEL RESTRAINTS (B1)
 UNSTOW HEADRESTS (B1)
 INSTALL ENTRY CUE CARDS (R3)

PYRO BAT CK

98+00-

GDC/IMU COMPARISON CK LIST

V16 N20E
 FDAI SELECT - 1
 FDAI SOURCE - ATT SET
 ATT SET - GDC
 ZERO FDAI 1 ERROR NEEDLES
 WITH ASCP TW
 KEY VERB WHEN ZERO
 RECORD N20 VALUES
 RECORD ASCP TW VALUES
 RECORD DET
 FDAI SELECT - 1/2

BMAG 2 GDC/IMU COMPARISON RESULTS

N20	R	+							
IMU	P	+							
	Y	+							
ASCP TW	R	XX						XX	
GDC	P	XX						XX	
	Y	XX						XX	
DET(30:00)ΔT	XX	XX							

LOGIC SEQUENCER CK

NOTE: CHECKS STATUS OF ELS PB'S
 CM/SM SEP SW'S AND 24K' BARO SW'S
 SECS PYRO ARM (2) - SAFE (VERIFY)
 SECS LOGIC (2) - OFF (VERIFY)
 CB SECS LOGIC (2) - CLOSE (VERIFY)
 CB SECS ARM (2) - CLOSE
 CB ELS/CM-SM SEP (2) - CLOSE
 ELS LOGIC - ON (UP)
 ELS - AUTO
 COORDINATE NEXT 3 STEPS WITH STDN
 SECS LOGIC (2) - ON (UP)
 STDN CONFIRM GO FOR PYRO ARM AS REQ
 SECS LOGIC (2) - OFF
 CB SECS ARM (2) - OPEN
 ELS LOGIC - OFF
 ELS - MAN
 CB ELS/CM-SM SEP (2) - OPEN

PYRO BAT CK

PNL 250
 CB PYRO A SEQ A - CLOSE (VERIFY)
 CB PYRO B SEQ B - CLOSE (VERIFY)
 DC IND - PYRO BAT A, THEN B
 *IF PYRO BAT A(B) < 35 VDC *
 * (REPLACES FAILED PYRO BAT *
 * WITH ENTRY BAT) *
 CB PYRO A(B) SEQ A(B) - OPEN
 CB PYRO A(B) BAT BUS A(B) TO
 * PYRO BUS TIE - CLOSE *
 PNL 275
 CB MNA BAT C - CLOSE
 CB MNB BAT C - CLOSE (APPLIES
 ENTRY BAT C TO BOTH MAIN
 BUSES WHEN MAIN BUS TIE
 SWITCHES ARE ON)
 DC IND - MNB

E/1-2

DATE 5/9/75

98+00
11112
01111

M
A
D

P52 (OPT 3) (33, 37, 42) (RECORD)*IF N93 >1.5 DEG/HR/AXIS*
P00
* RECYCLE P52
* IF CONFIRMED:
* USE SCS FOR EMS ENTRY*

98+10

30:00

IF BMAG 2 >10 DEG/HR/AXIS *****
*END SCS DRIFT CK (BMAG 1) PERFORM *
* GDC/IMU COMPARISON CK LIST PG E/1-2*

T
A
N

TRANSMIT GYRO TORQUE ANGLES AND TIME OF GYRO TORQUE

98+20

EMS ENTRY CK

EMS ΔV TEST AND NULL BIAS CK
TRANSMIT EMS NULL BIAS CK RESULTS

RSI ALIGNMENT
GDC ALIGN

98+30

SECONDARY WATER EVAP ACTIVATION

P52 (OPT 3)

N71 1ST STAR	XX	0	0	0		
N71 2ND STAR	XX	0	0	0		
N05(R1) ANG ERR	XX					
N93	X					
GYRO						
TORQUING	Y					
ANGLES	Z					
TIME OF	HR	+	0	0	0	
GYRO	MIN	+	0	0	0	
TORQUE	SEC	+	0		0	0

EMS ENTRY CK

EMS FUNC - OFF
CB EMS (2) - CLOSE (PNL 8)
EMS MODE - STBY
EMS FUNC - EMS TEST 1 (WAIT 5 SEC)
EMS MODE - NORMAL (WAIT 10 SEC)
CHECK IND LTS - OUT
RANGE IND - 0.0
SLEW HAIRLINE OVER NOTCH
IN SELF-TEST PATTERN
EMS FUNC - EMS TEST 2
.05G LT - ON (ALL OTHERS OUT)
WAIT 10 SEC
EMS FUNC - EMS TEST 3
.05G LT - ON
RSI LOWER LT - ON (10 SEC LATER)
SET RANGE COUNTER TO 58 NM ±0.0
EMS FUNC - TEST 4
.05G LT - ON (ALL OTHERS OUT)
G-V TRACE WITHIN PATTERN TO LWR RT
CORNER AT 9G
RNG IND COUNTS DOWN TO 0.0 ±0.2NM
EMS FUNC - TEST 5
.05G LT - ON
RSI UPPER LT - ON (10 SEC LATER)
RANGE IND - 0.0
SCRIBE TRACES VERTICAL LINE 9G TO
0.28 ±0.1G
SET SCROLL TO 37K FPS
EMS - OFF/STBY

EMS ΔV TEST AND NULL BIAS CK

EMS MODE - STBY (VERIFY)
EMS FUNC - ΔV SET/VHF RNG
SET ΔV IND TO 1586.8 FPS
EMS MODE - NORMAL
EMS FUNC - ΔV TEST
SPS THRUST LT - ON/OFF (10 SEC)
ΔV IND STOPS AT -0.1 TO -41.5
EMS MODE - STBY
EMS FUNC - ΔV SET/VHF RNG
SET ΔV IND TO -100.0 FPS
CMC MODE-FREE(UNTIL MEAS COMPLETE)
OR BMAG MODE (3) - RATE 2
EMS FUNC - ΔV (WAIT 5 SEC)
START DET
00:00 EMS MODE - NORMAL
01:40 EMS MODE - STBY(RECORD)OFF
IF ΔV <1 FPS, DO NOT BIAS
IF ΔV >1 FPS BUT <10 FPS,
STDN PROVIDE BIAS IN PAD ΔVC
IF ΔV >10 FPS, EMS IS NO-GO

RSI ALIGNMENT

NOTE: RSI ALIGNMENT IS PERFORMED
EVEN IF RSI ALIGNMENT IS CORRECT
IN ORDER TO CK OPERATION OF RSI
FDAI SOURCE - ATT SET
ATT SET - GDC
EMS ROLL - ON (UP)
GDC ALIGN PB - PUSH AND HOLD
YAW TW - POSITION RSI THROUGH 45 DEG
SET TO LIFT UP (HDS DN)
OR TO LIFT DN (HDS UP) ATT PER
ENTRY UPDATE PAD
GDC ALIGN PB - RELEASE
EMS ROLL - OFF

SEC WATER EVAP ACTIVATION

ELECTROPHORESIS COOLING VLV - BYPASS
(VERIFY) (PNL 165)
EVAP H2O CONT SEC VLV - AUTO(PNL 382)
ECS IND SEL - SEC
SEC COOL LOOP PUMP - AC2
GLY DISCH SEC PRESS - 40-52 PSIG
SEC COOL LOOP EVAP - EVAP
SEC GLY EVAP OUT TEMP- 38-50.5 DEG F
ECS IND SEL - PRIM

E/1-3

DATE 5/9/75

98+30-

11112
01111
00:00-

CM RCS PREHEAT CK LIST

FINAL STOWAGE CK LIST

SET UP CAMERA FOR FIREBALL PHOTOGRAPHY
CM4/DAC/25/CX05 - BRKT, MIR
(T11, 1/500, 7) 2 FPS

98+40-

98+50-

20:00-

CM RCS PREHEAT TERMINATION CK LIST CONFIGURE PANEL CB'S (NOT SWITCHES)

99+00-

CM RCS PREHEAT CK LIST

NOTES:

1. IF SYS TEST MTR 5C, 5D, 6A, 6B, 6C, & 6D ALL READ ≥ 4.0 VDC, OMIT PREHEAT
SYS TEST METER-5B (BAT RLY BUS)
2. IF PREHEAT REQ'D, PREHEAT UNTIL ALL JETS READ ≥ 4.0 VDC, OR 20 MINUTES, WHICHEVER OCCURS FIRST
3. CHECKS CM RCS 24, 25, 12, 14, 16, AND 21 JET INJECTOR VALVE TEMPERATURES, RESPECTIVELY
4. DIRECT COILS USED FOR PREHEATING JETS

CB RCS LOGIC(2) - CLOSE (PNL 8)
CM RCS LOGIC - ON (UP) (PNL 1)
(ENERGIZES RCS LOGIC BUS)
CB CM RCS HTRS (2) - CLOSE (PNL 8)
CM RCS HTRS - ON (UP) (PNL 101)
SET DET COUNTING UP

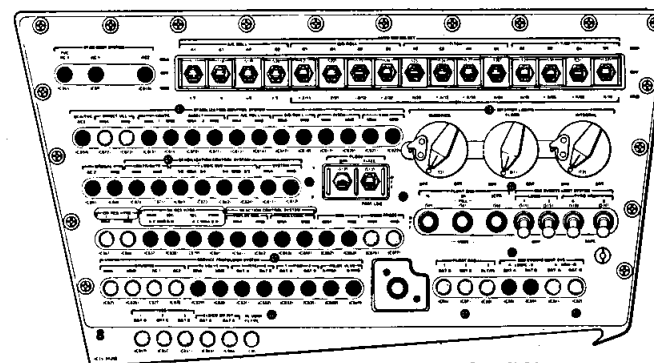
CM RCS PREHEAT TERMINATION CK LIST

CM RCS HTRS - OFF (PNL 101)
CM RCS LOGIC - OFF (PNL 1)
CB CM RCS HTRS (2) - OPEN (PNL 8)
SYS TEST MTR - 5B (BAT RLY BUS)

FINAL STOWAGE CK LIST

ORDEAL
FDAI (2) - INRTL
PWR - OFF, STOW
GLY TO RAD SEC VLV - BYPASS (CCW)
(VERIFY) (PNL 377)
ATTACH BOTH STRUT UNLOCK LANYARDS
VERIFY SUIT BAGS TIED DOWN TO A1, A4, AND A6
VERIFY UCTA'S STOWED IN PORTABLE WASTE STOWAGE CONTAINER (U1), HDC AND MAG IN (B3)

CHANGE DAC TO CM4 WINDOW
UNSTOW CX05 MAG FROM (B5)
AND INSTALL ON DAC



● - CLOSE
○ - OPEN

E/1-4

DATE 5/9/75

99+00

11112
01111

G
D
S

99+10

STDN UPLINK, UPDATE
P27 (SV, SPS TARGET LOAD)
FINAL DEORBIT BURN PAD (COPY PG E/1-6)
FINAL ENTRY PAD (COPY PG E/1-7)

N
F
L

99+20

ACQUIRE ATS HGA: MAN, WIDE P -38, Y 342
S-BD ANT IND > 1/3 SCALE, HGA: REACO, NARROW

S
P
1

CM RCS HTRS - OFF (VERIFY) (PNL 101)
CM RCS LOGIC - OFF (VERIFY) (PNL 1)
CB CM RCS HTRS (2) - OPEN (VERIFY) (PNL 8)

CM RCS ACTIVATION

PRE-SEP CK LIST

* IF SM RCS OR HYBRID *
* DEORBIT BURN, GO *
* TO PG E/5-1 *

H
A
D

99+30

CM RCS ACTIVATION

CB SECS ARM (2) - CLOSE
CUE STDN
SECS LOGIC (2) - ON (UP)
STDN CONFIRM GO
FOR PYRO ARM (IF POSS)
SECS PYRO ARM (2) - ON (UP)
CM RCS PRPLNT 1 & 2 TB (2) - GRAY
(VERIFY) (INDICATES FUEL AND
OXIDIZER ISOLATION VALVES OPEN)
CM RCS PRESS - ON (UP)
RCS IND SEL - CM1, THEN 2
HE PRESS STABILIZES AT 3600-3800
PSIA AFTER 15 MINUTES
MANF PRESS 287-302 PSIA
SECS PYRO ARM (2) - SAFE

PRE-SEP CK LIST

REPRESS PKG VLV - ON
O2 SM SUPPLY VLV - OFF
SURGE TK - ON (VERIFY)
CAB PRESS REL VLV (2) - NORM
CB WASTE H2O/URINE DUMP HTR(2)-OPEN
(PNL 5)
CB ECS RAD CONT/HTRS MNA/B (2)-OPEN
POT H2O HTR - OFF
ABORT SYS PRPLNT - RCS CMD (VERIFY)

E/1-5

DATE 5/9/75

99+30

11112
01111
11102
01111

CYCLE CMC MODE SWITCH - FREE - AUTO
V48E, LOAD .5 DEG DBD, N47 AND N48 FROM DEORBIT BURN PAD
P30, VERIFY N33 AND N81 WITH DEORBIT BURN PAD
SET DET COUNTING UP TO DEORBIT BURN TIG
P00, V62E
V49E, MNVR TO DEORBIT BURN PAD ATT

99+40

SXT BORESIGHT STAR CK, V41 N91E (PG G/2-4)
(LIMIT: SXT FOV, GNCS GO/NO-GO)* IF GNCS NO-GO, SET TH TO:
* PAD BURN ATT *
* SC CONT - SCS *
* TRK HORZ WITH 15 DEG *
* WINDOW MK (HDS DN) *
* AT TIG - 2 MIN, *
* HOLD ATT *
* GDC ALIGN PB - PUSH *
* BURN SCS AT 0.180,0 *
* (7 DEG MK) *
* * * * *
STOW OPTICS EYEPieces
CREW STRAPPED IN AND SEATS LOCKED*
STOW COAS AND DIM LIGHTS
GO TO SPS BURN-ENTRY CUE CARD
(DUAL BANK)

99+50

TAKEOVER RULES

P OR Y RATES	ATTITUDE DEVIATION	CO TIME
+/-5 DEG/SEC TAKEOVER, COMPLETE	+/-5 DEG/SEC TAKEOVER, COMPLETE	AT BT +1 SEC

NOTE: LARGEST SPS EXECUTION ERRORS THAT
CAN BE STEERED OUT BY ENTRY GUIDANCE:
BURN LATE (90 SEC)
UNDERBURN (11 FPS)
OVERBURN (16 FPS)
IF SPS TRIM RESIDUALS >.2 FPS, .2G DRE
NAV CK IS NOT VALID

SPS DEORBIT BURN

100+00

SPS DEORBIT BURN PAD
NOMINAL

		PRELIMINARY						FINAL					
N33	HR	+	0	0	1	0	0	+	0	0			
	MIN	+	0	0	0	0	0	+	0	0	0		
	SEC	+	0	0	0	0	0	+	0				
N81	ΔVX	-	0	1	9	1	3		0				
	ΔVY	+	0	0	0	0	0		0				
	ΔVZ	+	0	0	2	0	1		0				
N22	R	+	0	0	0	0	0	+			0	0	
	P	+	1	8	0	0	0	+			0	0	
	Y	+	0	0	0	0	0	+			0	0	
	ΔVC	XX	XX	1	7	4	0	XX	XX				
	BT	XX	XX	0	0	0	7	XX	XX				
	ΔV75	XX	XX	0	7	8	0	XX	XX				
	TARGET HP	+	XX	XX	1	0	3		XX	XX			
N47	WT	+	2	5	2	9	1	+					
N48	PT	+	0	0	0	6	9		0	0			
	YT	-	0	0	0	2	9		0	0			
	STAR	XX	0	0	0	3	3	XX	0	0	0		
	SFT	+	0	4	8	5	0	+				0	
	TRN	+	3	2	2	0	0	+			0	0	
	ULLAGE	XX	XX	XX	1	4	4	XX	XX	XX			

SPS BURN STATUS (AFTER TRIM)

ΔTIG	XX	XX			
ΔVC		XX			
FDAI (IF ATT NOT NOM)	R	+			XX XX
	P	+			XX XX
	Y	+			XX XX
N85 (IF VG >.2)	ΔVX		0	0	
	ΔVY		0	0	
	ΔVZ		0	0	

COMPLETION RULES

SITUATION	COMPLETION RULE
VG <60 FPS	TRIM VG TO +/- .2 START WITHIN 30 SEC
VG >60 FPS	RESTART SPS SCS
NO RESTART, HP <75	USE RCS COMPLETION CHARTS (4 OR 3 QUADS) AS APPLICABLE
NO RESTART, HP >75, 4 QUAD CAPABILITY	USE RCS 4 QUAD COMPLETION CHART
NO RESTART, HP >75, 3 QUAD CAPABILITY	GO AROUND 6 REVS TO BACKUP TARGET

E/1-6

DATE 5/9/75

100+00-

11102
01111

RECORD BURN STATUS

WARNING: WAIT UNTIL COMP ACTY LT - OUT

V66E
CM RCS CK
BMAG MODE (3) - ATT 1/RATE 2
YAW TO CM/SM SEP ATT
PER ENTRY PAD

IF BOTH RINGS FAILED
PERFORM ROLLING ENTRY
CK LIST

V37E 6ZE
CM/SM SEP CK LIST

CM/SM SEP

MONITOR V MNA/B
YAW BACK TO 0 DEG
PRO
VERIFY LAT, LONG FROM PAD
LOAD R3=-1(LIFT UP);
+1(LIFT DN)
PRO
(POSSIBLE 06 22 IF ANGLE
OF ATTACK >045 DEG)
STDN UPDATE FINAL ENTRY
PAD
EMS INITIALIZATION

PITCH TO PAD P.05G
(050 DEG)

GO TO ENTRY (PG E/2-1)

P62
F50 25

POSSIBLE ALARMS
01427-ROLL REVERSED
01426-IMU UNSAT

F06 61

IF <25 VDC, PERFORM CM LD
* PWR RECONFIG, PG E/7-8 *

P63
06 64

IF LIFT DN
ROLL TO 180 DEG AND TRACK
* HORZ ON 9 DEG WINDOW MK*

100+10

O
R

100+20

100+30

CM RCS CK

AUTO RCS SEL A/C ROLL (4) - OFF
(VERIFY)
CB RCS LOGIC (2) - CLOSE (VERIFY)
SC CONT - SCS/MIN IMP
RCS TRNFR - CM
AUTO RCS SEL (RING 1) - OFF
AUTO RCS SEL (RING 2) - MNB
TEST RING 2 THRUSTERS (MIN IMP MAY
NOT PRODUCE AUDIBLE JET FIRING.
USE 3 CYCLES)
AUTO RCS SEL (RING 1) - MNA
AUTO RCS SEL (RING 2) - OFF
TEST RING 1 THRUSTERS
AUTO RCS SEL (RING 2) - MNB
RCS TRNFR - SM
MAN ATT (3) - RATE CMD

CM/SM SEP CK LIST

PRIM GLY TO RAD-BYPASS
(PULL)
GLY EVAP TEMP IN-MAN
CB SPS P & Y (4) - OPEN
CB ELS/CM-SM SEP (2) -
CLOSE
VHF AM (A&B) - OFF(CTR)
STDN CONFIRM GO FOR ATS
PWR ON
ATS F PWR AMPL-OFF(CTR)
ATS F XPND-OFF(CTR)
ATS F HGA POWER-OFF
RHC PWR DIRECT #2-MNA/B
CM RCS LOGIC - ON (UP)
CUE STDN IF IN CONTACT
STDN CONFIRM GO FOR
PYRO ARM (IF POSS)
SECS PYRO ARM(2)-ON(UP)
VERIFY CORRECT SEP ATT
PER ENTRY PAD REMARKS
CM/SM SEP (2) - ON (UP)
MAN ATT (3) - MIN IMP
BMAG MODE (3) - RATE 2
C/W MODE - CM
RCS TRNFR - CM
CM RCS MANF PRESS -
287 - 302 PSIA
SECS PYRO ARM (2) -SAFE
AUTO RCS SEL(12)-MNA/B
(VERIFY)
CM RCS LOGIC - OFF

EMS INITIALIZATION

EMS FUNC - TEST 5
VERIFY SCROLL ON 37K
EMS FUNC - RNG SET
SET RNG TO PAD RTOGO
EMS FUNC - V0 SET
SLEW SCROLL TO PAD VIO
EMS MODE - STBY(VERIFY)
EMS FUNC - ENTRY
VERIFY .05G LT FILTER
IS DOWN

ROLLING ENTRY CK LIST

*BMAG MODE (3) - ATT 1/RATE 2
*MAN ATT (3) - RATE CMD (VERIFY)
*SC CONT - SCS
*MNVN TO 0, 0 DEG
* (PITCH FROM ENTRY PAD REMARKS)
*DBD/RATE - MIN/LOW
*AT RET .05G - 90 SEC. JUST
* BEFORE CM/SM SEP;
* FOAI SCALE - 50/15
* MAN ATT ROLL - ACCEL CMD
*ROLL RIGHT ~20 DEG/SEC
*CAUTION: ATT HOLD IN PITCH AND
*YAW MUST BE MAINTAINED UNTIL
*CM/SM SEP

ENTRY PAD PRELIMINARY FINAL

AREA	XX					XX					
SEP ATT	Y		TO			Y		TO			
P.05G	+				0 0	+				0 0	
N61 LAT			0					0			
LONG											
RTOGO .05G	+					+					
VIO .05G	+					+					
RET .05G	XX	XX				XX	XX				
RET 0.2G	XX	XX				XX	XX				
N66 DRE											
BANK AN											
RET RB	XX	XX				XX	XX				
RET BBO	XX	XX				XX	XX				
RET EBO	XX	XX				XX	XX				
RET DROG	XX	XX				XX	XX				
RET MAIN	XX	XX				XX	XX				

REMARKS:

E/1-7

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ENTRY

P63 - ENTRY - INIT

1 06 64 G,VI,RTOGO (.01G,fps,.1nm) 2

RET .05G FDAI SCALE - 5/5
-5 min

RET .05G GNCS/SCS_ATTITUDE_CHK
-2 min

Check IMU vs. GDC pitch attitudes agree
within 5 deg

*DO NOT AGREE * * * * *

* Lift_up

* RET .05G - 1 min, check horiz on 33 deg
* window mk (Limit: +/- 5 deg) GO/NO-GO
* If GNCS GO, fly lift up to .2G,
* then CMC/AUTO

* *If GNCS NO-GO, track horiz on
* 29 deg window mk, hold lift
* up to .2G, then EMS entry

* Lift_dn

* Check pitch error needle centered
* (Limit: +/- 5 deg) GO/NO-GO
* If GO or NO-GO, track horiz on 9 deg
* window mk, hold lift dn to 1.0G
* (V16 N74, R3) then,
* If GNCS GO, CMC/AUTO
* *If GNCS NO-GO, EMS entry
* * * * *

GNCS_GO, Lift_up

Hold PAD entry att, fly lift up to .2G
GNCS_GO, Lift_dn

Track horiz on 9 deg window mk, fly
lift dn to 1.0G (V16 N74, R3)

RET .05G EMS MODE - BACKUP/VHF RNG
(.05G lt - on)
(---:---) .05G sw - on (up)
EMS ROLL - on (up)

P64 - ENTRY - POST .05G

06 74 BETA,VI,G (.01 deg,fps,.01G)

Start DAC
MAN ATT (3) - RATE CMD

RET .2G P67 - ENTRY - FINAL PHASE (POST .2G)

3 (---:---) 06 66 BETA,CRSRNG ERR,DNRNG ERR (.01 deg,.1nm)
(+ is north & long)

DOWN_RANGE_GNCS_GO/NO-GO_NAV_CHK:

KEY VERB

Record DNRNG ERR ----- PAD -----

KEY RLSE

(Limit: +/-180 NM IF ΔV TRIM <30 FPS,
GNCS GO/NO-GO)

(DRE CHECK INVALID FOR ΔV TRIM >30 FPS)

*If GNCS_NO-GO: *

* *

* Fly EMS (Pg E/2-2) *

1ST_CROSS_RANGE_GNCS_GO/NO-GO_NAV_CHK

If initial BETA direction not same
as PAD, GNCS is NO-GO

*If GNCS_NO-GO: *

* *

* Fly EMS (Pg E/2-2) *

E/2-1

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ENTRY

ENTRY

At .2G (lift up) or 1G (lift dn)

If GNCS is GO:

SC CONT - CMC/AUTO

*If DAP NO-GO: *

* SC CONT - SCS*
* Fly BETA *

*If GNCS NO-GO:

* Fly EMS
* Go to PAD BACKUP BANK AN at .2G(lift up)
* or 1G(lift dn)
* Reverse bank at RET RB
* At 800 nm scroll line
* If RTOGO <500 nm, roll toward 90 deg
* If RTOGO >600 nm, roll toward 0 deg
* Fly to get RTOGO convergence between
* 300 nm and 200 nm scroll lines
* At 4000 fps for nom tgt, 16 nm at 2.7G
* If RTOGO >16 nm, fly toward lift up
* If RTOGO <16 nm, fly toward lift dn

*If GNCS & EMS NO-GO: *

* Fly PAD bank/reverse bank*

CH RCS CK

RCS IND - CH 1, 2

*If both RCS rings *

* He pressure <2000 psia: *
* Roll right ~20deg/sec *

Select best omni as req'd to maintain
Comm after exit blackout

RET RB
-1 min

(__:__)

2ND CROSS RANGE GNCS GO/NO-GO NAV CK:

If BETA reverses earlier than 1 min
before PAD RET RB, GNCS is NO-GO.

*If GNCS NO-GO: *

* Fly EMS (see above)*

RET

90K'(__:__)STEAM PRESS - pegged at ~90K'

Start Watch

(00:00)

4 F 16 67 RTOGO, LAT, LONG(Vrel=1000 fps) (.1nm, .01 deg)

SC CONT - SCS
RTOGO NEG (R1) - LIFT UP
RTOGO POS (R1) - LIFT DN

Monitor altimeter
Stop DAC
DAC - T8, 12 FPS

Go to EARTH/POST LANDING, pg E/3-1

E/2-2

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EARTH/POST LANDING

RET
50K' (__: __) CABIN PRESS REL vlv (2) - BOOST/ENTRY (00:50) Watch
SECS PYRO ARM (2) - on (up)
Check altimeter
40K' (__: __) *If CM unstable: (01:04)
* RCS CMD - OFF
* 40K' APEX COVER JETT pb - push
* DROGUE DEPLOY pb - push
* (2 sec after apex cover jett)
30K' ELS LOGIC - on (up) (01:23)
ELS - AUTO
24K' (__: __) RCS disable (auto) Start DAC (01:36)
(May be 23K') *RCS CMD - OFF*
Apex cover jett (auto)
APEX COVER JETT pb - push
(Wait 2 sec)
Drogue parachutes deployed (auto)
DROGUE DEPLOY pb - push
*If both drogues fail:
* ELS - MAN
* Stabilize CM (direct RCS)
* 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 chutes deployed (drogues +46 sec) (02:22)
(Cab Press = 10 psia) MAIN DEPLOY pb - push
(3) VHF ANT - RECY
VHF AM A - SIMPLEX
(If B-SIMPLEX or A-DUPLEX req'd, turn beacon off during comm)
VHF BCN - ON
Record LAT _____, LONG _____
& voice to RECY at 10K'
*IF GNCS NO-GO,
* RECORD EMS RTOGO _____
EMS - OFF/STBY
*If no contact with recovery forces:
* Refer to POST LANDING
* COMMUNICATIONS, Pg E/3-2
CABIN PRESS REL vlv (RH) - DUMP
Stow DAC
STRUT LOCKS (4) - UNLOCK
*If night landing:
* cb FLOAT BAG #3, FLT/PL (1) - close
* PL BCN LT - LO
* (Max. of 5 minutes operation in HI,
* if requested by recovery)
(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
(8) cb SPS P & Y (4) - open (verify)
(2) ELS - AUTO (verify)
ELS LOGIC - on (up) (verify)
(8) FLOOD LTS - POST LDG
(325) CAB PRESS REL vlv (2) - CLOSE (latch off)
(7) Direct O2 vlv - open (CCW) (if suited)
(5) MN BUS TIE (2) - OFF

EARTH/POST
LANDING

E/3-1

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EARTH/POST
LANDING

STABILIZATION AFTER LANDING

- (229) cb MAIN REL PYRO (2) - close
- (2) MAIN RELEASE - on (up)
- (8) SECS PYRO ARM (2) - SAFE
- SECS LOGIC (2) - OFF
- (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

- (15) PL BCN LT - LO (night landing)
(Max. of 5 minutes operation in HI, if
requested by recovery)
- (2) PL VENT vlv - UNLOCK (pull into detent)
Remove PL VENT exh cover
- (15) PL VENT - HIGH or LOW
(Max. of 12 hours operation in HIGH, if
selected)
 - *If fan frozen *
 - * PL VENT - LOW *
 - * cb PL VENT - open *
 - *To close PLV: *
 - * cb PL VENT - close *
 - * PL VENT - OFF *
 - *If attitude switch failure, to operate PLV* *
 - * PL VENT - LOW *
- (376) * PLVC - OPEN *
- *To turn off PLV: *
- * PL VENT - OFF *

If dye marker req'd:

PL DYE MARKER - ON (by request)

- (275) cb MNA BAT BUS A & BAT C (2) - open
- cb MNB BAT BUS B & BAT C (2) - open
- cb FLT & PL BAT C - open
- (250) cb PYRO A SEQ A - open (helicopter recovery only)
- cb PYRO B SEQ B - open (helicopter recovery only)
- Verify BAT BUS A & B voltage ≥ 27.5 vdc
 - *If < 27.5 vdc: *
 - * cb FLT & PL BAT C (1) - close *
 - * cb FLT & PL BAT BUS A & B (2) - open *
 - * Go to LOW POWER CHECKLIST, Pg E/3-5 *
- (U3) Unstow and install PLV DISTRIB DUCT (3)
Deploy grappling hook and line if req'd
(by request)

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POST LANDING COMMUNICATIONS

- (3) VHF ANT - RECY (verify)
VHF BCN - ON (verify)
- (6,9) VHF AM - T/R (verify)
- (3) VHF AM A & B - SIMPLEX (verify)
- *If no contact with recovery forces:
- (6,9) * VHF AM - REC
- * Center couch attempt to contact recovery forces
- * If contact reestablished and left or right couch wish to Transmit:
- (6,9) * VHF AM - T/R (only long enough to transmit, then VHF AM - REC)
- *If still no contact with recovery forces:
- * 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 bcu ant cable conn P112 behind ant access pnl and place radio in BCN mode
- (Use tool E to open VHF antenna access panel and tool F to loosen connector P112)
- *After 1 hour on the water:
- (3) * VHF AM A(B) - OFF
- * VHF AM RCV ONLY - A
- *On the quarter hour and every quarter hour thereafter:
- (3) * VHF AM A - SIMPLEX
- * VHF RCV ONLY - OFF
- (6,9) * VHF AM - REC
- * Center couch transmit in blind, 5 minutes
- (3) * VHF AM A - OFF
- * VHF AM RCV ONLY - A

If shipboard recovery, continue Pg E/3-3
If helicopter recovery, go to Pg E/3-4
If unaided egress, go to Pg E/3-4

SHIPBOARD EGRESS & POWERDOWN

- GEAR BOX SEL - N
- ACTR HNDL SEL - N
- Check hatch GN2 pressure gauge
- If > mid-white
- GN2 vlv HNDL - VENT (pull)
- GN2 vlv HNDL - Neutral (detent)
- Check pressure gauge (mid-white)
- *Repeat press/vent to obtain mid-white*
- If < mid-white
- Charge hatch counterbalance
- GN2 vlv HNDL - PRESS (push)
- GN2 vlv HNDL - Neutral (detent)
- Check pressure gauge (mid-white)
- *Repeat press/vent to obtain mid-white*
- Inform recovery you are ready for egress

COMMENTS:

- Recovery will keep you informed of retrieval status.
- CM will remain powered up for comm until immediately prior to egress.
- Stay strapped in couch for retrieval.
- When CM is safely on ship (recovery will so inform you) inform recovery you are ready for egress
- Recovery Team Leader will knock three times on side hatch window to indicate crew is clear to open side hatch
- Crew will open hatch
- GEAR BOX SEL - UNLATCH
- ACTR HNDL SEL - UNLATCH
- LOCK PIN REL KNOB - UNLOCK
- Operate ratchet handle until hatch open
- Verify hatch overcenter lock engaged
- ACTR HNDL SEL - N
- Stow ratchet handle
- When hatch open
- (15) PL VENT - OFF
- cb PANEL 250 (all) - open
- (R1) Remove MA151 (Germanium & Sodium Iodide Crystal Experiment)
- Hand MA151 experiment and bag to Recovery Team Leader
- Egress

E/3-3

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HELICOPTER EGRESS & POWERDOWN

GEAR BOX SEL - N
ACTR HNDL SEL - N
Check hatch GN2 pressure gauge
If > mid-white
GN2 vlv HNDL - VENT (pull)
GN2 vlv HNDL - Neutral (detent)
Check pressure gauge (mid-white)
Repeat press/vent to obtain mid-white
If < mid-white
Charge hatch counterbalance
GN2 vlv HNDL - PRESS (push)
GN2 vlv HNDL - Neutral (detent)
Check pressure gauge (mid-white)
Repeat press/vent to obtain mid-white

Inform swimmer you are ready for equipment bag by knocking on side hatch window

COMMENTS:

CM VHF - BCN and BCN LT will remain on to aid in maintaining visual/radio acquisition after crew egress.
Swimmer will open hatch.
Swimmer will hand in equipment bag containing Life Preserver Units (LPU), Tempscribe temperature recorder, tape, and MA151 handling container
Crew will close hatch; swimmers will assist

Receive equipment bag from swimmer
Close hatch
GEAR BOX SEL - LATCH
ACTR HNDL SEL - LATCH
Overcenter lock - Disengage
(Use D ring to disengage lock)
Operate ratchet handle until hatch locked
GEAR BOX SEL - N
ACTR HNDL SEL - N

Tape Tempscribe to X-X foot strut
Don LPU's
(R1) Remove MA151 (Germanium & Sodium Iodide Crystal Experiment)/bag and place in handling container
(15) PL VENT - OFF
PL BCN LT - LO (verify) (night landing only)
(3) VHF AM A/B - OFF
(6,9,10) VHF AM - OFF
Inform swimmer you are ready for egress by knocking on side hatch window
Egress, inflate LPU when out of hatch (last man out hand MA151 handling container to swimmer)

3 CREWMEN 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 *
* 2-1/2 hrs *

STABLE I

Disconnect umbilicals (if suited)
(PGA) Neck dams on (if suited)
Configure center couch to 0 deg
Armrests stowed
Check hatch GN2 pressure gauge
If > mid-white
GN2 vlv HNDL - VENT (pull)
GN2 vlv HNDL - Neutral (detent)
Check pressure gauge (mid-white)
Repeat press/vent to obtain mid-white
If < mid-white
Charge hatch counterbalance
GN2 vlv HNDL - PRESS (push)
GN2 vlv HNDL - Neutral (detent)
Check pressure gauge (mid-white)
Repeat press/vent to obtain mid-white
(R4) Unstow rucksacks 1B & 2
Connect lanyards
(yellow to rucksack, green to head strut, white to crew, in order of egress printed on lanyards)

E/3-4

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- (15) PL VENT - OFF
 cb PANEL 250 (all) - open
 Open side hatch
 GEAR BOX SEL - UNLATCH
 ACTR HNDL SEL - UNLATCH
 LOCK PIN REL KNOB - UNLOCK
 Operate ratchet handle until hatch opens
 Verify hatch overcenter lock engaged
 ACTR HNDL SEL - N
 Remove life raft from rucksack 2
 Throw life raft overboard and inflate
 Transfer to life raft with rucksack 1B

CAUTION: Inflate life vests and egress in order designated on white lanyards.

Last man out disconnect green lanyard from head strut. Attach lanyard to sea anchor attach fitting on CM

STABLE 11

- Disconnect umbilicals (if suited)
 (PGA) Neck dams on (if suited)
 Configure center couch to 0 deg
 Armrests stowed
 (6,9,10) PWR (3) - OFF
 SUIT FWR (3) - OFF
 (R4) Unstow rucksacks 1B & 2
 Attach yellow lanyards from rucksack 2 to 1B
 Reposition umbilicals to clear tunnel area
 Review tunnel hatch handle location and hatch unlocking procedure
 PRESS EQUAL vlv - OPEN
 Pull dentent knob on end of handle, then pivot up 90 deg
 Rotate crank ~3 turns CCW to fully open valve
 NOTE: Tunnel will fill with water

- (F2) Remove and stow tunnel hatch on F2
 Connect lanyards from rucksack 2 (green to foot strut, white to crewmen, in order of egress printed on lanyards)

Egress Procedure: Face LEB, verify lanyard routing, exit feet first, first man carrying rucksack. When clear of S/C inflate life vest and board raft.

CAUTION: Egress in order designated on white lanyards.

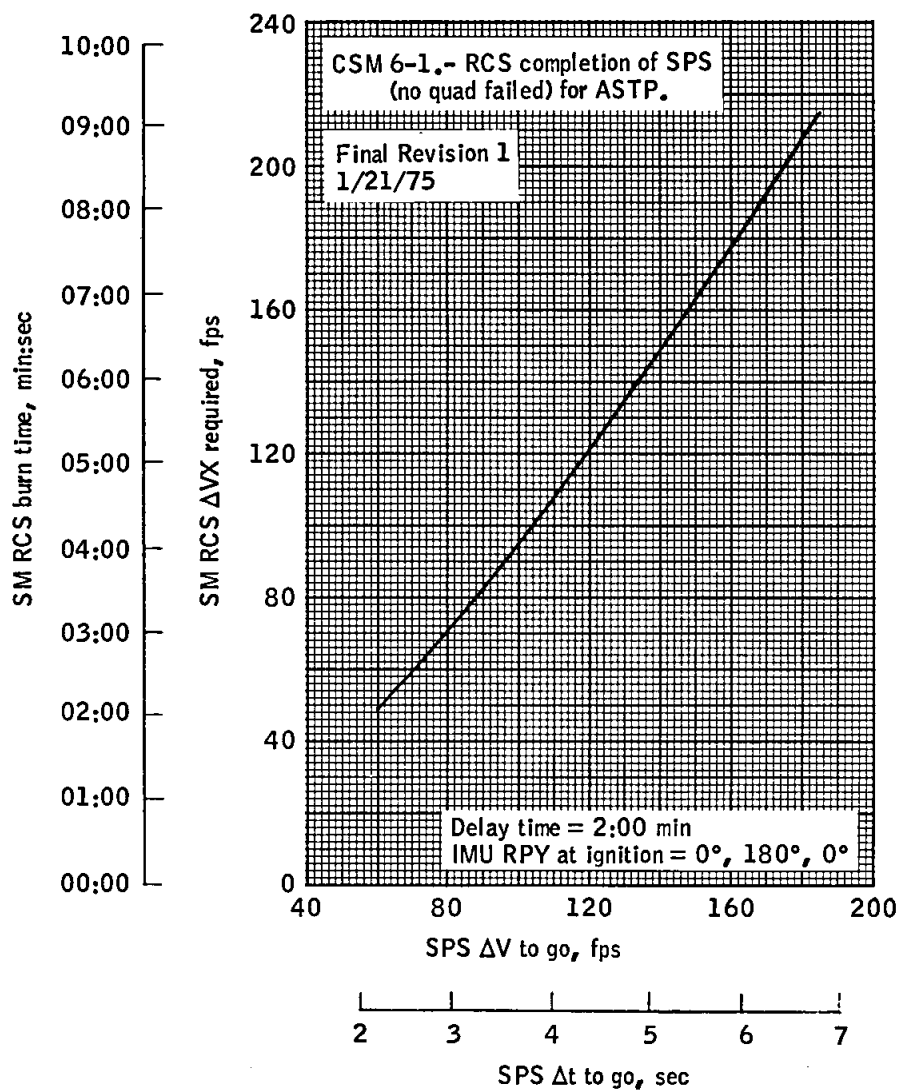
1st - Before egress lower rucksack 1B through man tunnel. Carry rucksack 2 out.
 out After egress inflate raft, retrieve rucksack 1B.

2nd - Egress

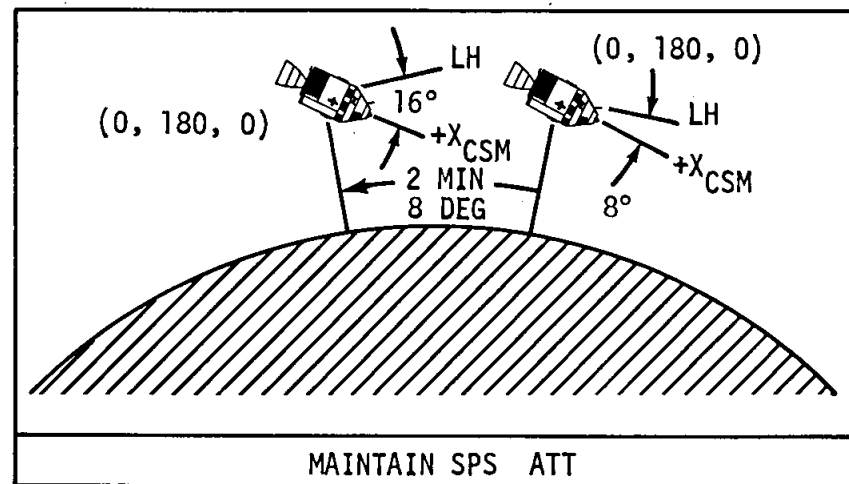
3rd - Before egress disconnect green lanyard from foot strut. After egress attach green lanyard to sea anchor attach fitting on CM.

LOW POWER CHECKLIST

- VHF BCN - OFF
 VHF AM (3) - RCV
 FLOOD LTS - OFF
 VHF AM A & B - off (ctr)
 VHF AM RCV ONLY - A (verify)
 POST LANDING VENT SYS: minimize use
 (Min. of 5 minutes/hour to scrub cabin air of CO2)
 SURV RADIO - plug into VHF BCN ANT cable
 conn P112 behind VHF ant access pnl &
 turn radio on in BCN mode



COMPLETION
CHARTS



RCS COMPLETION OF SPS
(NO QUADS FAILED)

NOTE: MAX CONTINUOUS $+X$
BURN TIME IS 12 MIN,
30 SEC

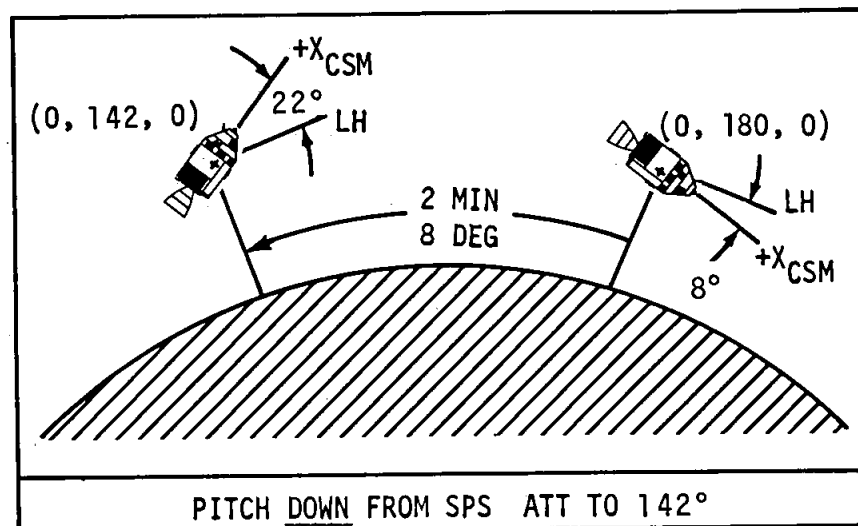
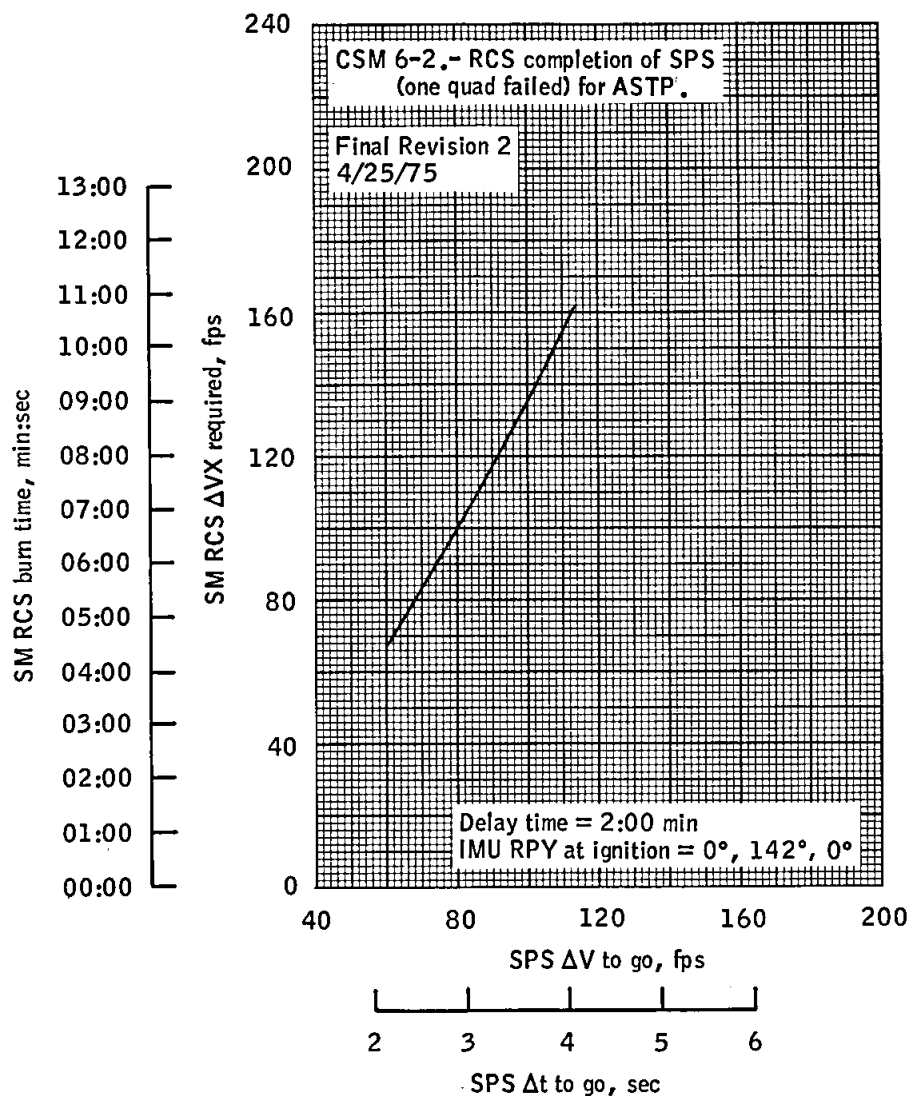
1. MAINTAIN SPS ATT
2. AT SPS FAIL, RECORD VG FROM N40
R2 OR FROM EMS ΔV COUNTER $+18 =$ _____ FPS.
3. ΔV THRUST - OFF (VERIFY)
4. V34E, F37, 47E
5. SC CONT - CMC
6. AUTO RCS SEL A/C ROLL (4) - MNA/B
7. THC - BEGIN $+X$ RCS THRUSTING
8. SPS GMBL MTRS - OFF
9. CHART SM RCS ΔV_X REQ'D = _____ FPS
10. V82E, N83E
11. AT RCS COMPLETION, COMPLETE SPS BURN-ENTRY
CUE CARD AND CONTINUE ON Pg E/1-7.
12. FOR ENTRY
LIFT DN TO 1G THEN GNCS (RSI REVERSED)
(IF NO GNCS, ROLL TO PAD BANK AN)
START EMS AT PAD RET .05G WITH PAD VALUES.
0.2G DRE CK AND RET RB -1 MIN CK NOT VALID.

SPS
+2:00

E/4-1

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COMPLETION CHARTS



RCS COMPLETION OF SPS (ONE QUAD FAILED)

NOTE: MAX CONTINUOUS +X
BURN TIME IS 12 MIN,
30 SEC

1. AT SPS FAIL, RECORD VG FROM N40
RZ OR FROM EMS ΔV COUNTER +18 = _____ FPS.
2. ΔV THRUST - OFF (VERIFY)
3. V25 N17E, +E, +14200E, +E, V63E
4. V34E, F37, 47E
5. SC CONT - CMC
6. AUTO RCS SEL ROLL (CHART) - MNA/B
VERIFY DAP LOAD (CHART)

QUADS FAILED	AUTO RCS SEL-MNA/B	DAP LOAD
A	C1&C2	10102, 00111
B	D1&D2	11002, 11011
C	A1&A2	10102, 01101
D	B1&B2	11002, 11110

7. SPS GMBL MTRS - OFF
8. RHC - MNVR TO (0, 142, 0)
9. FLY ERROR NEEDLES
10. THC - BEGIN +X RCS THRUSTING
11. CHART SM RCS ΔV REQ'D = _____ FPS.
12. V82E, N83E
13. AT RCS BURN COMPLETION, COMPLETE SPS BURN-ENTRY
CUE CARD AND CONTINUE ON Pg E/1-7.
14. FOR ENTRY
LIFT DN TO 1G THEN GNCS (RSI REVERSED)
(IF NO GNCS, ROLL TO PAD BANK AN)
START EMS AT PAD RET .05G WITH PAD VALUES.
0.2G DRE CK AND RET RB -1 MIN CK NOT VALID.

SPS
+2:00

E/4-2

DATE 5/9/75

SM RCS/
HYBRID

HYBRID

2 MIN
or
ASAP

RATE-HIGH
FDAI SCALE - 5/5
SC CONT - SCS
AUTO RCS A/C ROLL (4) - OFF
cb ELS/CM - SM SEP (2) - CLOSE
CM RCS LOGIC - ON
SECS PYRO ARM (2) - ON
CM/SM SEP (2) - ON
C/W MODE - CM
RCS TRNFR - CM
CM RCS LOGIC - OFF
CM RCS MANF PRESS - 287-302
V MNA/B >25V
* IF <25V - CM LO PWR, PG E/7-8 *

MAN ATT PITCH - ACCEL CMD
V63E (CM BURN ATT)
* IE GNCS NO-GO *
* SET TW TO CM BURN ATT *
* FROM BURN PAD REMARKS *
* FDAI - ATT SET, 1 or 2, GDC *

PITCH UP TO CM BURN ATT (NULL NEEDLES)
(110 DEG > SM BURN ATT)

CM RCS BURN

RHC #1 - CONTINUOUS PITCH DOWN
RHC #2 - MODULATE PITCH TO NULL NEEDLES
* IF ONLY 1 RHC *
* PULSE +/- P = 5 DEG FROM BURN ATT *
* MAINTAIN RATES <3 DEG/SEC *

BURN RULES

UNPLANNED HYBRID

BURN FOR 100 SEC
V82E, IF Hp >38 NM - BURN Hp = 38 NM

PLANNED HYBRID

BURN VGZ TO +/- .2
V82E, IF Hp > PAD - BURN Hp = PAD
* IF HE TK PRESS <2000, BURN Hp = CAPTURE HP *

PRO

RECORD BURN STATUS

RCS BURN STATUS (AFTER BURN)

ΔVC			XX	XX			
FDAI (IF ATT NOT NOM)	R	+				XX	XX
	P	+				XX	XX
	Y	+				XX	XX
N85	ΔVX		0	0			
	ΔVY		0	0			
	ΔVZ		0	0			

E/5-2

DATE 5/9/75

PRO
 00E
 SECS PYRO ARM (2) - SAFE
 EMS - OFF/STBY
 MAN ATT (3) - MIN IMP
 RHC #1 - LOCKED
 RHC PWR NORMAL #1 - OFF
 RHC PWR DIRECT #1 - OFF
 THC - LOCKED
 THC PWR - OFF
 BMAG MODE (3) - RATE 2

V66E
 CONFIGURE CM RCS
 FOR SINGLE RING ENTRY (AUTO RCS SEL (RING 1
 OR 2)(6)-OFF FOR RING WITH LOWEST He PRESS)
 V37E 62E (AVE G ON)
 05 09 01427 - ROLL REVERSED
 *05 09 01426 - IMU UNSAT *

F 50 25 00041 REQUEST CM/SM SEP
 PRO

F 06 61 IMPACT LAT, LONG, LIFT UP/DN (-/+)
 (.01deg, +/-00001)
 Verify LAT, LONG from PAD (Pg E/1-7)
 Load R3 = +1 (lift dn)

PRO
 POSS 06 22 FINAL ATT DISP, RPY (.01 DEG)
 (Only if angle of attack >45 deg)

P63 - ENTRY - INIT

06 64 G, VI, RTOGO (.01G, fps, .1nm)

EMS_INITIALIZATION

EMS FUNC - TEST 5
 Verify scroll on 37K fps
 EMS FUNC - RNG SET
 Set RNG to PAD DATA RTOGO
 EMS FUNC - Vo SET
 Slew scroll to PAD DATA VIO
 EMS MODE - STBY (verify)
 EMS FUNC - ENTRY
 Verify .05G lt filter is down

RSI_ALIGNMENT

Verify correct RSI alignment
 lift dn = 180 DEG

DIM LIGHTS

ROLL TO 180 DEG AND TRACK HORIZ ON
 9 DEG WINDOW MK (LIFT DN)

GO TO ENTRY, Pg E/2-1 *IF UNPLANNED HYBRID* * *
 * LIFT DN TO 1G, THEN *
 * ROLL RIGHT TO 270 DEG*
 * (LV SOUTH), NO RB *
 * * * * *

E/5-3

DATE 5/9/75

LAUNCH CHECKLIST ITEMS

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)

21:30 SIVB MNVR TO RETROGRADE LOCAL HORIZONTAL

ECS POST INSERTION CONFIG

(MUST BE PERFORMED BETWEEN +20:00M & +55:00M)

- (352) POT TK IN VLV - OPEN (CCW)
- (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 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 WASTE H2O/URINE DUMP HTR (2) - CLOSE

CSM/LV SEPARATION PREP

AUTO RCS SELECT (16) - MNA/MNB
SET ΔVC TO -100.0
EMS FUNC - ΔV
FDAI SCALE - 5/1
MAN ATT (3) - RATE CMD (VERIFY)
ATT DB - MIN/HIGH (VERIFY)
THC PWR - ON (UP)
RHC PWR NORMAL #2 - AC/DC (VERIFY)
RHC PWR DIRECT #2 - MNA/MNB
BMAG MODE (3) - RATE 2 (VERIFY)
RCS TRNFR - SM (VERIFY)
SM RCS PRPLNT TB (8) - GRAY (VERIFY)
* IF LV GUID - CMC: *
* DO NOT RELOAD DAP *
* MNVR TO SEP ATT (. . .) *
LOAD RCS DAP 11103,01111
V46E
LOAD N17 (SEP)
V63E (MONITOR SIVB MNVR)

50:00 SIVB MNVR TO SEP ATTITUDE

CSM SEPARATION

ATT SET TW - R=0,P=180,Y=0
CB RCS LOGIC (2) - OPEN
CB SECS LOGIC (2) - CLOSE (VERIFY)
CB SECS ARM (2) - CLOSE
SECS LOGIC (2) - ON (UP)
SECS PYRO ARM (2) - ARM
TVC SERVO PWR #1 - AC1/MNA
RHC & THC - ARMED
SET DET - 59:30
RCS CMD - ON
FC REAC VLV - LATCH

E/6-1

DATE 5/9/75

TAPE RCDR - HBR/RCD/FWD/CMD RESET

*IF LV GUID - CMC: *

* INSURE RATES NULLED AND *

* YAW DRIFTING TOWARDS 0 *

*LOAD DAP 11103,01111 *

*V46E, V60E, V63E *

GDC ALIGN (0, 180, 0)

V62E

0+59:30

START DET

59:30

P47

EMS MODE - NORMAL

59:58

THRUST +X AND HOLD

00:00

CSM/LV SEP PB - PUSH, HOLD, AND RELEASE

LV TANK PRESS - FULL SCALE LOW (SEP IND)

*IF NO SEPERATION: *

* CB RCS LOGIC (2) - CLOSE *

* THC - CCW (4 SEC MIN) *

* DET RESET AND COUNTING UP (AUTO) *

* LV TK PRESS - FULL SCALE LOW *

~00:02

THC - RELEASE ($\Delta V = 0.5$ FPS)

SM RCS PRPLNT TB (8) - GRAY (VERIFY)

SM RCS QUAD HE TB (4) - GRAY (VERIFY)

FC REAC VLV - NORM

00:30

THRUST +X 4 QUAD, 8 SEC ($\Delta V = 3.0$ FPS)

P00

EMS - OFF/STBY

THC PWR - OFF

THC - LOCKED

RHC PWR DIRECT #2 - OFF

TAPE RCDR - LBR

SECS PYRO ARM (2) - SAFE

SECS LOGIC (2) - OFF

EDS PWR - OFF

CB EDS (3) - OPEN

COAS PWR - OFF

TVC SERVO PWR #1 - OFF

CB SECS ARM (2) - OPEN

LV/SPS IND - GPI

AC ROLL (4) - OFF

BLOCK DATA		2-2 DEORBIT						3-4 DEORBIT					
N33	HR	+	0	0				+	0	0			
	MIN	+	0	0	0			+	0	0	0		
	SEC	+	0			0	0	+	0			0	0
N81	ΔV_X		0						0				
	ΔV_Y		0						0				
	ΔV_Z		0						0				
N22	R	+				0	0	+				0	0
	P	+				0	0	+				0	0
	Y	+				0	0	+				0	0
	ΔV_C	XX	XX					XX	XX				
	BT	XX	XX					XX	XX				
	P .05G	XX				0	0	XX				0	0
	RTOGO .05G	+						+					
	VI0 .05G	+						+					
	RET .05G	XX	XX					XX	XX				
	RET 0.2G	XX	XX					XX	XX				
	N66 DRE												
	BANK AN												
	RET RB	XX	XX					XX	XX				
	RET DROG	XX	XX					XX	XX				
N61	LAT		0						0				
	LONG												
REMARKS:													

2-2

3-4

2-2/3-4 DEORBIT

ASSUMPTIONS:

1. NOMINAL INSERTION ORBIT
2. NO RENDEZVOUS MANEUVERS HAVE BEEN PERFORMED
3. SUITS MAY BE DOFFED AT CREW'S DISCRETION IF TIME PERMITS (PG E/6-5)
4. PRE-BURN PROCEDURES MARKED BY * ARE NECESSARY TO ENSURE A SAFE RETURN AND MUST BE PERFORMED BY THE CREW
THESE PROCEDURES CAN NOMINALLY BE PERFORMED IN ~20 MINUTES
5. PROCEDURES NOT MARKED BY '*' SHOULD BE PERFORMED AT THE CREW'S DISCRETION AS TIME PERMITS
6. THE DEORBIT BURN IS PERFORMED WITH THE G&N (N&I ΔV'S FROM BLOCK DATA PAD)
7. THIS CK LIST MAY BE ENTERED FROM EITHER THE LAUNCH OR RNDZ CK LISTS
8. TIMES AT TOP OF BOXES ARE FOR 2-2 DEORBIT.
TIMES AT BOTTOM OF BOXES ARE FOR 3-4 DEORBIT.

00+30

03+15

VERIFY LAUNCH CHECKLIST ITEMS (PG E/6-1, 2) COMPLETE

SET DET COUNTING UP TO DEORBIT BURN TIG
V48, VERIFY CSM DAP, 4 JET, .5 DEG DBD, AND 2 DEG/SEC
V46E
VERIFY ORDEAL STOWED
LOGIC SEQUENCER CK (IF IN STDN CONTACT)

00+40

03+25

11103

01111

UNSTOW AND DON LIFE VESTS (F1) AND HEEL RESTRAINTS (B1)
UNSTOW HEADRESTS (B1)
INSTALL ENTRY CUE CARDS (R3)

25:00--

SET UP CAMERA FOR FIREBALL PHOTOGRAPHY
CH4/DAC/T8/CX03 - BRKT, MIR
(T11, 1/500, 7) 12 FPS
PYRO BAT CK

00+50

03+35

LOGIC SEQUENCER CK

NOTE: CHECKS STATUS OF ELS PB'S
CM/SM SEP SW'S, AND 24K' BARO SW'S
SECS PYRO ARM (2) - SAFE (VERIFY)
SECS LOGIC (2) - OFF (VERIFY)
CB SECS LOGIC (2) - CLOSE (VERIFY)
CB SECS ARM (2) - CLOSE
CB ELS/CM-SM SEP (2) - CLOSE
ELS LOGIC - ON (UP)
ELS - AUTO
COORDINATE NEXT 3 STEPS WITH STDN
SECS LOGIC (2) - ON (UP)
ARM AND SAFE PYROS PER STDN COMMAND
SECS LOGIC (2) - OFF
CB SECS ARM (2) - OPEN
ELS LOGIC - OFF
ELS - MAN
CB ELS/CM-SM SEP (2) - OPEN

PYRO BAT CK

PNL 250
CB PYRO A SEQ A - CLOSE (VERIFY)
CB PYRO B SEQ B - CLOSE (VERIFY)
DC IND - PYRO BAT A, THEN B
* IF PYRO BAT A(B) <35 VDC *
* (REPLACES FAILED PYRO BAT *
* WITH ENTRY BAT *
* CB PYRO A(B) SEQ A(B) - OPEN *
* CB PYRO A(B) BAT BUS A(B) TO *
* PYRO BUS TIE - CLOSE *
PNL 275; CB MNA BAT C - CLOSE
CB MNB BAT C - CLOSE (APPLIES ENTRY
BAT C TO BOTH MAIN BUSES WHEN
MAIN BUS TIE SWITCHES ARE ON)
DC IND - MNB

RSI ALIGNMENT

NOTE: RSI ALIGNMENT IS PERFORMED
EVEN IF RSI ALIGNMENT IS CORRECT
IN ORDER TO CK OPERATION OF RSI
FDAI SOURCE - ATT SET
ATT SET - GDC
EMS ROLL - ON (UP)
GDC ALIGN PB - PUSH AND HOLD
YAW TW - POSITION RSI THROUGH
45 DEG SET TO LIFT UP (HDS DN)
OR TO LIFT DN (HDS UP) ATT PER
BLOCK DATA REMARKS
GDC ALIGN PB - RELEASE
EMS ROLL - OFF

EMS ENTRY CK

EMS FUNC - OFF
CB EMS (2) - CLOSE (PNL 8)
EMS MODE - STBY
EMS FUNC - EMS TEST 1 (WAIT 5 SEC)
EMS MODE - NORMAL (WAIT 10 SEC)
CHECK IND LTS - OUT
RANGE IND - 0.0
SLEW HAIRLINE OVER NOTCH
IN SELF-TEST PATTERN
EMS FUNC - EMS TEST 2
.05G LT - ON (ALL OTHERS OUT)
WAIT 10 SEC
EMS FUNC - EMS TEST 3
.05G LT - ON
RSI LOWER LT - ON (10 SEC LATER)
SET RANGE COUNTER TO 58 NM ±0.0
EMS FUNC - TEST 4
.05G LT - ON (ALL OTHERS OUT)
G-V TRACE WITHIN PATTERN TO LWR
RT CORNER AT 9G
RNG IND COUNTS DOWN TO 0.0 ±0.2NM
EMS FUNC - TEST 5
.05G LT - ON
RSI UPPER LT - ON (10 SEC LATER)
RANGE IND - 0.0
SCRIBE TRACES VERTICAL LINE 9G TO
0.28 ±0.1G
SET SCROLL TO 37K FPS
EMS - OFF/STBY

E/6-3

DATE 5/9/75

00+50
03+35
11103
01111

RSI ALIGNMENT (PG E/6-3)
ALIGN GDC

EMS ENTRY CK (PG E/6-3)

35:00

EMS ΔV CK AND NULL BIAS CK

- * P00, V62E
- * V49E, MNVR TO DEORBIT BURN PAD ATT (BLOCK DATA PAD)

01+00
03+45

- * CONFIGURE PANEL 8 CB'S (NOT SWITCHES)
- * ACTIVATE CM RCS

P30, LOAD N33 AND N81 FROM BLOCK DATA PAD

- * PRE-SEP CK LIST

45:00

P52 (OPT 3) () AUTO OPTICS TO STAR
(LIMIT: SXT F0V, GNCS GO/NO-GO)*IF GNCS NO-GO* * * * *
EXIT 06 92, V37E 40E * SET TW TO (0, 180, 0)*
DEORBIT BURN PREP CK LIST * SC CONT - SCS
GO TO SPS BURN-ENTRY CUE CARD * TRK HORIZ WITH 15 DEG*
(DUAL BANK) * WINDOW MK (HDS DN) *
* * * * *
* AT TIG - 2 MIN, *
* HOLD ATT *
* GDC ALIGN PB - PUSH*
* BURN SCS AT 0,180,0 *
* (7 DEG MK) *
* * * * *

01+10
03+55

55:00

TAKEOVER RULES

P OR Y RATES	ATTITUDE DEVIATION	CO TIME
5 DEG/SEC TAKEOVER & COMPLETE	5 DEG/SEC TAKEOVER & COMPLETE	AT BT +1 SEC

DEORBIT BURN

01+20
04+05

EMS ΔV TEST AND NULL BIAS CK

EMS MODE - STBY (VERIFY)
EMS FUNC - ΔV SET/VHF RNG
SET ΔV IND TO 1586.8 FPS
EMS MODE - NORMAL
EMS FUNC - ΔV TEST
SPS THRUST LT - ON/OFF (10 SEC)
ΔV IND STOPS AT -0.1 TO -41.5
EMS MODE - STBY
EMS FUNC - ΔV SET/VHF RNG
SET ΔV IND TO -100.0 FPS
CMC MODE-FREE(UNTIL MEAS COMPLETE)
OR BHAG MODE (3) - RATE 2
EMS FUNC - ΔV (WAIT 5 SEC)
START DET
00:00 EMS MODE - NORMAL
01:40 EMS MODE - OFF/STBY
IF ΔV <1 FPS, DO NOT BIAS
IF ΔV >1 FPS BUT <10 FPS,
STON CONFIRM BIAS IN PAD ΔVC
IF ΔV >10 FPS, EMS IS NO-GO

CM RCS ACTIVATION

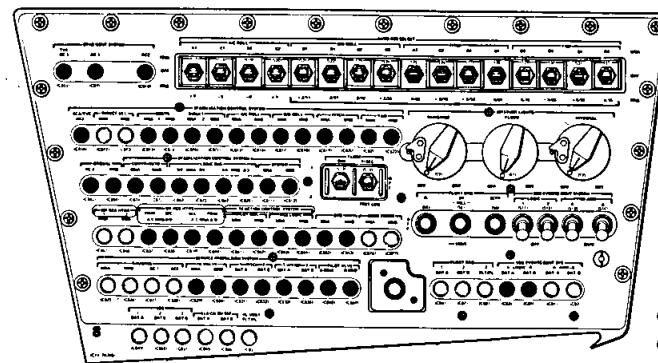
CB SECS ARM (2) - CLOSE
CUE STDN
SECS LOGIC (2) - ON (UP)
STDN CONFIRM GO
FOR PYRO ARM (IF POSS)
SECS PYRO ARM (2) - ON (UP)
CM RCS PRPLNT 1 & 2 TB (2) - GRAY
(VERIFY) (INDICATES FUEL AND
OXIDIZER ISOLATION VALVES OPEN)
CM RCS PRESS - ON (UP)
RCS IND SEL - CM1, THEN 2
HE PRESS STABILIZES AT 3600-3800
PSIA AFTER 15 MINUTES
MANF PRESS 287-302 PSIA
SECS PYRO ARM (2) - SAFE

PRE-SEP CK LIST

DC IND - BAT C
REQUEST STDN MONITOR NEXT STEP
(IF POSS)
MN BUS TIE (2) - ON (UP)
CONNECTION WILL BE VERIFIED BY BAT
C VOLTAGE DROP OF 0.5-5.0 VOLTS
TO WITHIN 0.5 VOLTS OF MAIN BUS
VOLTAGE
SECOND CONNECTION MAY BE LESS
OBVIOUS
PRIM GLY TO RAD - BYPASS (PULL)
REPRESS PKG VLV - ON
02 SM SUPPLY VLV - OFF
SURGE TK - ON (VERIFY)
CAB PRESS REL VLV (2) - NORM
CB WASTE H2O/URINE DUMP HTR(2)-OPEN
(PNL 5)
CB ECS RAD CONT/HTRS MNA/B (2)-OPEN
POT H2O HTR - OFF
GLY EVAP TEMP IN - MAN (REMOVES PWR
FROM GLY MIXER TO CONSERVE BAT PWR
ABORT SYS PRPLNT - RCS CMD (VERIFY)

DEORBIT BURN PREP CK LIST

STOW OPTICS EYEPieces
INSTALL OPTICS COVERS
CREW STRAPPED IN AND SEATS LOCKED
STOW COAS AND LOCK IN MOUNT
SET ASCP TW TO DEORBIT BURN PAD ATT
DIM LIGHTS FOR HORIZ CK



● - CLOSE
○ - OPEN

E/6-4

DATE 5/9/75

01+20
04+05
11103
01111

WARNING: WAIT UNTIL COMP ACTY LT - OUT

V66E
CM RCS CK
BMAG MODE (3) - ATT 1/RATE 2
YAW TO CM/SM SEP ATT
PER BLOCK DATA PAD

*IF BOTH RINGS FAILED *
PERFORM ROLLING ENTRY
* CK LIST

V37E 6ZE
CM/SM SEP CK LIST

CM/SM SEP

MONITOR V MNA/B
YAW BACK TO 0 DEG
PRO
VERIFY LAT, LONG FROM PAD
LOAD R3=-1(LIFT UP);
+1(LIFT DN)
PRO
(POSSIBLE 06 22 IF ANGLE
OF ATTACK >045 DEG)
EMS INITIALIZATION

PITCH TO PAD P.05G

GO TO ENTRY (PG E/2-1)

P62
F50 25

F06 61

P63
06 64

POSSIBLE ALARMS * *
01427-ROLL REVERSED
01426-IMU UNSAT

IF <25 VDC, PERFORM CM L0
* PWR RECONFIG, PG E/7-8 *

*IF LIFT DN * * * * *
ROLL TO 180 DEG AND TRACK
* HORZ ON 9 DEG WINDOW MK*

PGA DOFFING AND STOWAGE CK LIST

INSTALL HOSE SCREENS (B2)
ON RETURN HOSES
PWR - OFF
SUIT PWR - OFF FOR DISCONNECT
AUDIO CONT - NORM
SUIT FLOW VLV - CABIN FLOW
(FOR UNSUITED CREWMAN)
(FULL FLOW FOR 3 UNSUITED)
DOFF PGA'S

(PGA BAG C,
AFT BKH)

(U2)

(R11)

DON BOOTS, JACKETS, COUNTER
PRESSURE GARMENTS, AND CWG
HARNESS (W/O CONN COVER)
SNAP BIO-BELTS TO GARMENTS
UNSTOW PGA BAG L AND R
STOW PGA'S, HELMETS, HELMET
BAGS, AND ACCESSORY BAGS IN PGA
BAGS, AND REMOVE THE PGA POCKET
ASSEMBLIES, WRIST DAMS, AND
NECK DAMS FROM F2 AND STOW ON
TOP OF A1, A4, AND A6
SECURE BAGS WITH TIE DOWN STRAPS
ATTACHED TO LOCKERS
UNSTOW UTCA CLAMPS, ATTACH TO
UTCA'S, AND STOW IN PORTABLE
WASTE STOWAGE CONTAINER (U1)

01+30
04+15

01+40
04+25

01+50
04+35

SPS BURN STATUS (AFTER TRIM)

ATIG		XX	XX						
AVC			XX						
FDAI	R	+				XX	XX		
(IF ATT P		+				XX	XX		
NOT NOM)	Y	+				XX	XX		
N85	AVX			0	0				
(IF VG									
>.2)	AVY			0	0				
	AVZ			0	0				

COMPLETION RULES

SITUATION	COMPLETION RULE
VG <60 FPS	TRIM VG TO +/- .2 START WITHIN 30 SEC
VG >60 FPS	RESTART SPS SCS
NO RESTART, HP <75	USE RCS COMPLETION CHARTS(4 OR 3 QUADS) AS APPLICABLE
NO RESTART, HP >75 4 QUAD CAPABILITY	USE RCS 4 QUAD COMPLETION CHART

CM RCS CK

AUTO RCS SEL A/C ROLL (4) - OFF
(VERIFY)
CB RCS LOGIC (2) - CLOSE (VERIFY)
SC CONT - SCS/MIN IMP
RCS TRNFR - CM
AUTO RCS SEL (RING 1) - OFF
AUTO RCS SEL (RING 2) - MNB
TEST RING 2 THRUSTERS (MIN IMP MAY
NOT PRODUCE AUDIBLE JET FIRING.
USE 3 CYCLES)
AUTO RCS SEL (RING 1) - MNA
AUTO RCS SEL (RING 2) - OFF
TEST RING 1 THRUSTERS
AUTO RCS SEL (RING 2) - MNB
RCS TRNFR - SM
MAN ATT (3) - RATE CMD

EMS INITIALIZATION

EMS FUNC - TEST 5
VERIFY SCROLL ON 37K
EMS FUNC - RNG SET
SET RNG TO PAD RTGO
EMS FUNC - VO SET
SLEW SCROLL TO PAD V10
EMS MODE - STBY(VERIFY)
EMS FUNC - ENTRY
VERIFY .05G LT FILTER
IS DOWN

CM/SM SEP CK LIST

CB SPS P & Y (4) - OPEN
CB ELS/CM-SM SEP (2) - CLOSE
CB CSM/DM FINAL SEP (2) - CLOSE
VHF AM (A & B) - OFF (CTR)
RHC PWR DIRECT #2 - MNA/B
CM RCS LOGIC - ON (UP)
CUE STDN IF IN CONTACT
STDN CONFIRM GO FOR PYRO ARM
(IF POSS)
SECS PYRO ARM (2) - ON (UP)
VERIFY CORRECT SEP ATT PER BLOCK
DATA PAD REMARKS (PG E/6-2)
CSM/DM FINAL SEP (2) - ON (UP)
CM/SM SEP (2) - ON (UP)
MAN ATT (3) - MIN IMP
BMAG MODE (3) - RATE 2
C/W MODE - CM
RCS TRNFR - CM
CM RCS MANF PRESS - 287-302 PSIA
SECS PYRO ARM (2) - SAFE
AUTO RCS SEL (12) - MNA/B (VERIFY)
CM RCS LOGIC - OFF

ROLLING ENTRY CK LIST

*BMAG MODE (3) - ATT 1/RATE 2
*MAN ATT (3) - RATE CMD (VERIFY)
*SC CONT - SCS
*MNVN TO 0, . . . , 0 DEG
* (PITCH FROM BLOCK DATA REMARKS)
*OBD/RATE - MIN/LOW
*AT RET .05G-90 SEC, JUST
* BEFORE CM/SM SEP;
* FDAI SCALE - 50/15
* MAN ATT ROLL - ACCEL CMD
*ROLL RIGHT ~20 DEG/SEC

CAUTION: ATT HOLD IN PITCH AND
YAW MUST BE MAINTAINED UNTIL
CM/SM SEP.

SYSTEMS FAILED PROCEDURES

IMU FAILURE

WHEN IMU FAILURE OCCURS

1.) PERFORM IMU FAILURE SWITCH LIST

SC CONT - SCS
IMU PWR - OFF
DBD/RATE - MIN/HIGH
BMAG MODE (3) - ATT 1/RATE 2
MAN ATT (3) - RATE CMD
FDAI SELECT - 1
FDAI SOURCE - ATT SET
ATT SET - GDC
LIMIT CYCLE - OFF

2.) SET REFSHMMAT FLAG

KEY V37E00E
V25N7E, 77E, 10000E, 1E

3.) INITIALIZE NO-DAP CONFIG

(VERIFY CSM DAP ACTIVATED
PRIOR TO NO-DAP CONFIG)
KEY V48E, V21E, OE, PRO, PRO
V24E AND LOAD PT & YT REQ'D FOR
DEORBIT, PRO, V46E

4.) EMP SL-50

REQUEST UPLINK AT 1ST
AVAILABLE OPPORTUNITY
(MANUAL LOAD ON Pg E/7-3)

5.) PROCEED TO APPROPRIATE POINT IN TIMELINE

AND AT NEXT STON SITE -
REPORT TRANSFER TO IMU FAILURE
SYSTEM FAILED PROCEDURES

NOTES

1.) N20 NEED NOT AGREE WITH CURRENT
SC ATT EXCEPT FOR P52 CALC OF N22, EMP SL-50
CALC OF N22, AND V83 CALC OF THETA.

2.) EMP SL-50 CONVERTS GYRO TORQUE
ANGLES (N93) INTO RESULTANT
ACTUAL CDU ANGLES (N22) AND
SETS N20=N22.

CMC FAILURE

WHEN CMC FAILURE OCCURS

1.) PERFORM CMC FAILURE SWITCH LIST

BMAG MODE(3) - RATE 2
DBD/RATE - MIN/HIGH
BMAG MODE(3) - ATT 1/RATE 2
MAN ATT(3) - RATE CMD
LIMIT CYCLE - OFF
IF STON CONFIRMS: CB GUID/NAV COMPUTER MNA/B - OPEN

2.) PERFORM IMU GO/NO-GO CHECK

IF GDC AND IMU COMPARE WITHIN 5 DEG - IMU IS GO
IF NOT, PERFORM BACKUP GDC AND IMU ALIGNMENT
(Pg G/3-12)

BACKUP GDC ALIGN PAD FOR STARS
ANTARES (33) AND NUNKI (37)

R			
P			
Y			

E/7-1

DATE 5/9/75

SYSTEMS
FAILED

SYSTEMS
FAILED

GDC_REFSMMAT_REALIGN_(P52)

- NOTES: 1. P51 IS NOT REQUIRED AS-LONG-AS A VALID REFSMMAT IS STORED OR CAN BE OBTAINED VIA STDN UPLINK.
2. IF DAP RELATED EXTENDED VERBS (i.e. V46, V48 LOAD) ARE EXECUTED, EMP SL-50 WILL REQUIRE RELOADING.
3. IT IS DESIRABLE TO MAINTAIN A CONSTANT INERTIAL ATT THROUGHOUT THE ENTIRE P52 OPT 3 (OR P52 OPT 3 & OPT 1) PROCEDURE. IF A MNVR IS REQUIRED, HOWEVER, RELOAD N20 WITH THE NEW ATT.
4. IT IS PROBABLE THAT THE GDC DRIFT RATE WILL BE GREATER THAN THE BMAG'S. AS A RESULT, THE FDAI BALL MAY BE DRIFTING WHEREAS THE SC IS MAINTAINING AN INERTIAL ATT. THEREFORE, THE SC ATT SHOULD NOT BE SLAVED TO THE INITIAL BALL READING, AND N20 SHOULD NOT BE RELOADED UNLESS A MNVR IS ACTUALLY COMMANDED BY THE ASTRONAUT.

ASSUMPTIONS: REFSMMAT FLAG SET; CSM DAP HAS BEEN ACTIVATED, FOLLOWED BY A NO-DAP INITIALIZATION; EMP SL-50 HAS BEEN LOADED.

(P52 OPT 3)

1. BMAG MODE (3) - RATE 2
DBD/RATE-MIN/LOW
BMAG MODE (3) - ATT 1/RATE 2
LIMIT CYCLE - ON (UP)
2. RHC-MNVR TO ACQUIRE STAR PAIR
ATT SET-GDC (VERIFY)
ZERO FDAI 1 ERROR NEEDLES WITH ASCP TW.
V25N20E
LOAD N20 WITH ASCP TW ANGLES.

3. V37E52E
PROCEED THRU P52 AND PERFORM STAR MARKS.
(IF ATT MNVR REQUIRED BETWEEN STAR MARKS RELOAD N20)
4. F 06 05 ACCEPT ANGULAR SEPARATION ERROR (REG 1) UP TO .40 DEG.
PRO
- F 06 93 TORQUING ANGLES OG, IG, MG (.001 DEG.)
V5N26E
VERIFY N26 = 10001, 1642, 50006 (IF NOT: RELOAD N26)
KEY RLSE
V30E *F 01 70 (RESTART)*
*REDO 2ND MARK *
- F 06 22 NEW ICDU ANGLES OG, IG, MG
SET ASCP TW TO N22 VALUES.
GDC ALIGN PB-PUSH.
PRO (SETS N20 = N22)
- F 06 93 TORQUING ANGLES OG, IG, MG
V32E (.001 DEG)
- F 50 25 00014 ALIGNMENT CHECK
(PERFORM 3RD STAR CHECK) PRO
5. V3700E
(IF IMMEDIATELY FOLLOWED BY P52 OPT 1, BYPASS REMAINING PROCEDURES)
LIMIT CYCLE - OFF
RATE - HIGH

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(P52 OPT 1) (IF IMMEDIATELY PRECEDED BY P52 OPT. 3,
STEPS 1 & 2 MAY NOT BE REQUIRED)

1. BMAG MODE (3) - RATE 2
DBD/RATE - MIN/LOW
BMAG MODE (3) - ATT 1/RATE 2
LIMIT CYCLE - ON (UP)
2. RHC - MNVR TO ACQUIRE STAR PAIR
ATT SET-GDC (VERIFY)
ZERO FDAI 1 ERROR NEEDLES WITH ASCP TW.
V25N20E
LOAD N20 WITH ASCP TW ANGLES.
3. V37E52E
ALIGN GDC TO N22.
RECORD N22 AND
LOAD N20 WITH N22.
PRO ON GYRO TORQUE REQUEST (REG 1 = 00013).
IGNORE PROG ALARM (#'S 211 & 217)
DO NOT TOUCH DSKY UNTIL F 50 25 00015 IS
DISPLAYED OR THE NEW REFSMMAT WILL BE LOST.
(WILL TAKE ~5 MIN)
CONTINUE IN P52 AND PERFORM STAR CHECK TO
VERIFY ALIGNMENT
4. IF STAR CHECK FAILS: CONTINUE IN P52 AND
PERFORM STAR MARKS (REF P52 OPT 3
PROCEDURES, STEPS 3, 4 & 5)
5. V37E00E
LIMIT CYCLE - OFF
RATE - HIGH

EMP SL-50 MANUAL LOAD

DSKy (REG 3
LOAD ADDRESS)

V21 N1E	77776E
3242E	E
6006E (3242)	34124E
	E
N15E	55237E
77775E	E
	35040E (3270)
2703E	E
2661E	4647E
77775E	E
2711E	24000E
2667E (3250)	E
	20456E
77775E	E
2717E	5537E
2675E	E
77634E	1677E
24017E	E
47471E	5537E
77634E	E
24017E (3260)	4E
	E
34747E	6E (3300)
77634E	E
24017E	E
47303E	E
	E
	31300E
	E
	52033E
	E
	31301E
	E
	54034E
	E
	5537E (3305)
	E
	V25 N26E
	10001E
	1642E
	50006E

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EMS ΔV/RANGE DISPLAY BLANK

FOR_SCS_BURNS, EMS FUNC - OFF, MAKE TIMED BURNS
SPS THRUST - DIRECT ON (TO INITIATE BURN)
ΔV THRUST - OFF (TO TERMINATE BURN)
SPS THRUST - NORMAL

IMU TO GDC ALIGNMENT

FDAI SEL - 1
FDAI SOURCE - ATT SET
ATT SET DIALS - 0.0,0
ATT SET - IMU
MNVR TO 0,0,0 ON FDAI 1 (IMU)

IMU CAGE - ON (UP) & HOLD
ATT SET - GDC
MNVR TO 0,0,0 ON FDAI 1 (GDC) AND NULL
ERROR NEEDLES
IMU CAGE - RELEASE

MARK BUTTON FAILED

FAILED_OPEN (BIT 6 CHANNEL 16 REMAINS = ZERO)

NOTE: DSKY OPERATIONS (e.g., V82E, V16 N20E) ARE
PERMITTED DURING ALIGNMENT MARKS.

BEFORE ANY MARKING,
LOAD FOLLOWING EMP (SL-5) (CAN BE LOADED ANYTIME)
V25 N26E
1E (1cs TIME DELAY)
2151E
16067E (FIXED MEMORY ADDRESS OF MARKDIF)

FOR EACH MARK,

KEY V31 (DO NOT KEY ENTR)
ENTR (WHEN STAR CENTERED)
(ENTR MUST BE DONE FROM NAV DSKY)

AFTER MARKING,
KEY V21 N26E, 0E (TO DISABLE EMP SL-5)

FAILED_CLOSED (BIT 6 CHANNEL 16 REMAINS = ONE)

NOTE: EMP SL-5 IS NOT REQUIRED.
PERFORM ALL PROGRAM PROCEDURES ON MAIN DSKY.

TO MARK, DEPRESS ANY KEY ON NAV DSKY.

CDU FAILURE

SYMPTOM - STRANGE STEERING IN P62 SERIES
SUSPECT TRANSIENT CDU PROBLEM (BIAS)
V16 N20E COMPARE N20 WITH BALL
IF Δ EXISTS - V40E
CONTINUE NORMAL G&N ENTRY
SYMPTOM - ISS LITE, ALARM 03777
SUSPECT CDU FROZEN OR RUNAWAY
V16 N20E COMPARE N20 WITH BALL
IF Δ EXISTS (EXCEPT YAW INTO GIMBAL LOCK,
IN WHICH CASE MAKE SCS/EMS ENTRY)
V25 N7E, 12E, 20E, 1E TO ZERO ALL CDU'S
LOAD N20 WITH 0, .05G PAD PITCH, 0 (LIFT UP)
180, .05G PAD PITCH, 0 (LIFT DN)
FLY ROLL DISPLAY ON DSKY UNDER SCS CONTROL

CMC ALARMS

THE CMC WILL BE TEMPORARILY NO-GO FOR MANEUVER
EXECUTION FOR ANY OF THE FOLLOWING ALARMS:

SINGLE_OCCURENCE

00205 07777
00214 10777
00777 13777
01107 14777
01407
03777
04777

CONTINUOUS_OCCURENCE

20430 21501
20607 21521
21204 31104
21206 31201
21210 31202
21302 31203
31211

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CANNOT SEE THROUGH OPTICS

FOR IMU ALIGNMENTS

IF COAS NOT CALIBRATED-

1. IF GDC & IMU COMPARE WITHIN 5 DEG-
PERFORM COAS LOS DETERMINATION
PROCEDURES (Pg G/2-19) ASAP.

IF NOT- VERIFY IMU ALIGNMENT:

USE P21 (G/4-5) TO OBTAIN ALTITUDE.
MNVR TO & MAINTAIN +X AXIS TRACK OF
HORIZON.

KEY V83E & VERIFY DEPRESSION ANGLE.

80 NM ALT = 348 DEG DEP ANG

120 NM ALT = 345 DEG DEP ANG

160 NM ALT = 343 DEG DEP ANG

IF IMU COMPARE WITHIN 5 DEG-

PERFORM COAS LOS DETERMINATION
PROCEDURES (Pg G/2-19) ASAP.

IF NOT- USE NOMINAL COAS

ANGLES (+0, +57470) FOR P54's .

2. IN PLACE OF P52 OPT 3-

USE P20 OPT 1 TO OBTAIN STAR SIGHTING
ATTITUDES:

LOAD N78 WITH +ZERO'S.

LOAD 1ST STAR, RECORD N18 AND

PERFORM AUTO MNVR TO STAR ATT.

RECALL P20, LOAD 2ND STAR & RECORD.

RECALL P20, LOAD 3RD STAR & RECORD.

PERFORM P54 OPT 3 (G/3-9):

CENTER STAR IN COAS.

VERIFY N91 LOADED WITH COAS LOS

ANGLES RECORDED (Pg G/2-20).

MANUALLY MNVR TO 2ND STAR.

FOR SUBSEQUENT P54's (WITH SAME REFSMMAT),

CAN USE V49 MNVR TO 1ST STAR.

3. IN PLACE OF P52 OPT 1 COARSE ALIGN- PERFORM

P52 OPT 1 PULSE TORQUE (ENTER ON
TORQUE REQUEST)

(DO NOT PERFORM STAR SIGHTINGS).

IF COAS LOS DETERMINATION HAS BEEN PERFORMED-
REPEAT ABOVE STEPS 2 & 3, AS REQUIRED.

FOR DEORBIT_BURN_IMU_CHK (PG E/1-6),

PERFORM P20 (OPT 1) MNVR TO CHECK STAR

IMU IS GO IF STAR <5 DEG FROM CENTER OF COAS.

STAR ROLL PITCH YAW

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

E/7-5

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OPTICS FROZEN

BEFORE DOING IMU ALIGN (PERFORM ONE TIME)

1. OPTICS PWR - OFF.
2. KEY V16 N91E AND COMPARE WITH TPAC'S
IF N91 = TPAC'S $\pm .22$ DEG, RECORD N91.
IF NOT, RECORD TPAC'S
3. KEY V64E, LOAD N94 WITH RECORDED SA & TA.
PRO, RECORD N78 REG 1 & REG 2.
PRO
4. GO TO IMU ALIGN

FOR IMU ALIGNMENTS

IN PLACE OF P52 OPT 3-
USE P20 OPT 1 TO OBTAIN STAR SIGHTING
ATTITUDES:
LOAD N78 WITH VALUES RECORDED ABOVE.
LOAD 1ST STAR, RECORD N18 AND
PERFORM AUTO MNVR TO STAR ATT.
RECALL P20, LOAD 2ND STAR & RECORD.
RECALL P20, LOAD 3RD STAR & RECORD.
PERFORM P54 OPT 3 (G/3-9):
CENTER STAR IN SXT WITH MIC.
VERIFY N94 LOADED WITH RECORDED SA & TA.
MANUALLY MNVR TO 2ND STAR.
FOR SUBSEQUENT P54'S (WITH SAME REFSMMAT),
CAN USE V49 MNVR TO 1ST STAR.
IN PLACE OF P52 OPT 1 COARSE ALIGN - PERFORM
P52 OPT 1 PULSE TORQUE (ENTER ON TORQUE
REQUEST)
(DO NOT PERFORM STAR SIGHTINGS).

FOR DEORBIT BURN IMU CK (PG E/1-6),

PERFORM P20 (OPT 1) (LOAD N78 = 0)
MNVR TO CHECK STAR
IMU IS GO IF STAR < 5 DEG FROM CENTER OF COAS.

N91 OR TPAC'S

SA _____ .
TA _____ .

N78

R1 _____ .
R2 _____ .

STAR ROLL PITCH YAW

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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MN BUS A LOST ENTRY

CM RCS CHECK

AUTO RCS SEL A/C ROLL (4) - OFF (VERIFY)
CB RCS LOGIC (2) - CLOSE (VERIFY)
SC CONT - SCS/MIN IMP
RCS TRNFR - CM
AUTO RCS SEL (ALL) - OFF
RHC PWR DIR #2 - MNA/B
TEST RING 1 PITCH & YAW THRUSTERS
 USING DIRECT RCS
AUTO RCS SEL (RING 2) - MNB
TEST RING 2 THRUSTERS (MIN IMP MAY
 NOT PRODUCE AUDIBLE JET FIRING.
 USE 3 CYCLES)
RCS TRNFR - SM

POST CM/SM SEP

AUTO RCS SEL (21, 22) - OFF
TEST RING 1 +/-ROLL THRUSTERS
 USING DIRECT RCS
AUTO RCS SEL (21, 22) - MNB
RHC PWR DIR #2 - OFF

MN BUS B LOST ENTRY

CM RCS CHECK

AUTO RCS SEL A/C ROLL (4) - OFF (VERIFY)
CB RCS LOGIC (2) - CLOSE (VERIFY)
SC CONT - SCS/MIN IMP
RCS TRNFR - CM
AUTO RCS SEL (ALL) - OFF
RHC PWR DIR #2 - MNA/B
TEST RING 2 PITCH & YAW THRUSTERS
 USING DIRECT RCS
AUTO RCS SEL (RING 1) - MNA
TEST RING 1 THRUSTERS (MIN IMP MAY
 NOT PRODUCE AUDIBLE JET FIRING.
 USE 3 CYCLES)
RCS TRNFR - SM

POST CM/SM SEP

AUTO RCS SEL (11, 12) - OFF
TEST RING 1 +/-ROLL THRUSTERS
 USING DIRECT RCS
AUTO RCS SEL (11, 12) - MNA
RHC PWR DIR #2 - OFF

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CM LO PWR RECONFIG

SYSTEM	SYSTEM LOAD (AMPS)	TOTAL SC LOAD (AMPS)
NOMINAL CM SYSTEMS CONFIGURATION	-	53.0
VERIFY DSE RECORDING	-	53.0
MISC PWR DOWN CB G&N OPTICS MNA/B (2) - OPEN G&N PWR (AC) - OFF LIGHTS - MIN REQ'D MISSION TIMER (PNL 306) - STOP EVENT TIMER (PNL 306) - STOP OPTICS EYEPIECE HTR - UNPLUG	2.0	51.0
ECS PWR DOWN ECS GLY PUMP SEL - OFF ECS RAD FLOW CONT PWR - OFF GLY EVAP TEMP IN - MAN GLY EVAP H2O FLOW - OFF GLY EVAP STEAM PRESS - MAN SEC COOL EVAP - RESET (FOR 58 SEC) SEC COOL EVAP - OFF SEC COOL LOOP PUMP - OFF SUIT COMP - OFF	7.1 3.9	43.9 40.0
CONFIGURE FOR SINGLE INVERTER OPERATION	4.0	36.0
COMM PWR DOWN S BD NORM PWR AMPL - OFF	3.0	33.0
SCS PWR DOWN BMAG POWER 1 - WARMUP BMAG POWER 2 - OFF FDAI/GPI PWR - OFF SCS ELECTRONICS PWR - OFF CB SCS LOGIC BUS (4) - OPEN RHC PWR NORMAL (2) - OFF	10.0	23.0
TOTAL	30.0	23.0

IF CM IN LO PWR CONFIG AND G&N FAILURE

CMC MODE - FREE
SCS PWR UP
CB SCS LOGIC BUS (4) - CLOSE
BMAG PWR 1 - ON
FDAI/GPI PWR - BOTH
SCS ELECTRONICS PWR - GDC/ECA
RHC PWR NORMAL #2 - AC/DC
CMC/IMU POWER DOWN
CB IMU HTR (2) - OPEN
CB G&N IMU MNA/B (2) - OPEN
V37E 06E
F 50 25, 00062, CMC PWR DN
PRO, HOLD (~5 SEC) UNTIL
STBY LT - ON

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BLOCK DATA DEORBIT	PROCEDURE LOCATION		
-5+30 DM CLOSEOUT	D/13-1	-1+35 P52 (OPT 3) (RECORD)	E/1-3
-4+20 P00 V62E V49 MNVR TO BLOCK DATA DEORBIT PAD ATT		-1+30 EMS ENTRY CK EMS ΔV & NULL BIAS CK RSI ALIGN ALIGN GDC	E/1-3 E/1-3 E/1-3
-4+10 CLOSE HATCH 1 HATCH 1 INTEGRITY CK	DECAL (TUNNEL 1) DECAL (TUNNEL 1)	-1+20 SEC H2O EVAP ACTIVATION CM RCS PREHEAT CK LIST	E/1-3 E/1-4
-4+00 APOLLO ACTIVE UNDOCKING	J/2-5	-1+10 FINAL STOWAGE CK LIST	E/1-4
-3+45 UNDOCK SC CONT - CMC BMAG MODE (3) - RATE 2		-1+00 CM RCS PREHEAT TERMINATION CK LIST CONFIGURE PANEL 8 CB'S	E/1-4 E/1-4
-3+40 DON SUITS SUIT INTEGRITY CK	S/1-12 S/1-15 (STEP 8)	-0+40 CM RCS ACTIVATION PRE SEP CK LIST	E/1-5 E/1-5
-2+30 PRE DM JETT CHECKLIST	S/3-5	-0+30 CYCLE CMC MODE SW - FREE - AUTO V48E, LOAD .5 DEG DBD P30, LOAD FROM BLOCK DATA SET DET P52 (OPT 3) AUTO OPTICS TO STAR (LIMIT: SXT FOV, GNCS GO/NO-GO) EXIT 06 92 STOW OPTICS CREW STRAPPED IN, SEATS LOCKED STOW COAS, DIM LIGHTS	
-2+16 DM JETTISON V48E, (11112) (11111)		-0+15 GO TO SPS BURN CUE CARD	
-2+10 P52 (OPT 3) (RECORD) P00 ALIGN GDC START SCS DRIFT CK (BMAG 2) DOFF SUITS	S/1-20	0+00 DEORBIT BURN	
-1+45 DON LIFE VESTS, HEEL RESTRAINTS INSTAL HEAD RESTS, CUE CARDS		CM/SM SEP	E/1-7
-1+40 PYRO BATT CK END SCS DRIFT CK	E/1-2 E/1-2	ENTRY	E/2-1

E/8-1

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BLOCK DATA
DEORBIT

BLOCK DATA
DEORBIT

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