

## SM RCS DEORBIT &amp; ENTRY

VEHICLE PREP COMPLETEP30 - EXTERNAL ΔV  
V37E 30E

- 1
- 2 F 06 33 GETI (hrs,min,.01sec)  
(ACCEPT) PRO  
(REJECT) LOAD DESIRED GETI
- 3 F 06 81 ΔVX,Y,Z (LV) (.1fps)  
(ACCEPT) PRO  
(REJECT) LOAD DESIRED DATA
- 4 F 06 42 HA,HP,ΔV (REQ) (.1nm,.1nm,.1fps)  
Record ΔV \_\_\_\_\_  
(ACCEPT) PRO  
(REJECT) Reselect P30 or P27. Load new param.
- 5 F 16 45 MARKS,TFI,MGA (marks,min-sec,.01°)  
\*MGA -00002: if \*  
\* IMU not aligned\*

Set DET

PRO

- 6 F 37 00E

7 SEPARATION CK LIST

PRIM GLY TO RAD - BYPASS (Pu11)  
 REPRESS PKG vlv - FILL to 865-935,  
 then ON  
 02 SM SUPPLY vlv - OFF  
 SURGE TK - ON (verify)  
 CAB PRESS REL vlv (2) - NORM  
 cb SECS ARM (2) - close (verify)  
 cb SECS LOGIC (2) - close (verify)  
 ROT CONTR PWR NORM (2) - AC/DC  
 ABORT SYS PRPLNT - RCS CMD (verify)  
 SM RCS SEC PRPLNT FUEL PRESS (4)-OPEN

DATE 12/13/71

SM RCS  
DEORBIT & ENTRY

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CM RCS CHECK

AUTO RCS A/C ROLL (4) - OFF (verify)  
 cb RCS LOGIC (2) - closed (verify)  
 SC CONT - SCS  
 MAN ATT (3) - MIN IMP  
 RCS TRNFR - CM  
 AUTO RCS SEL (RING 1) - OFF  
 AUTO RCS SEL (RING 2) - MNB  
 TEST RING 2 THRUSTERS  
 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

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RCS THRUSTING PREP

Load DAP  
 BMAG MODE (3) - RATE 2  
 SC CONT - CMC/AUTO

10

MNVR TO PAD BURN ATT (HDS DN)

V49E

R \_\_\_\_\_ (0°)  
 P \_\_\_\_\_ (180°)  
 Y \_\_\_\_\_ (0°)

11

PERFORM BORESIGHT & SXT STAR CHECK

V41 N91E

Stow optics eyepieces

12

P41 - RCS THRUSTING

V37E 41E

13

F 50 18 REQ MNVR TO BURN ATT (HDS DN) (.01°)  
 (AUTO) BMAG MODE (3) - RATE 2  
 SC CONT - CMC/AUTO

PRO

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06 18 AUTO MNVR TO FDAI RPY (.01°)

SM RCS  
DEORBIT & ENTRY

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15 F 50 18 REQ TRIM (.01°)  
 ALIGN SC ROLL  
 (AUTO TRIM) PRO  
 ATT DB - MIN  
 RATE - LOW  
 BMAG MODE (3) - ATT1/RATE 2  
 If long Lambert (P37) burn  
 BMAG MODE (3) - RATE 2  
 ENTR

55:00m  
 16 06 85 VG X,Y,Z (.1fps)  
 RECHECK BORESIGHT STAR  
 TRANS CONTR PWR - on (up)  
 EMS MODE - STBY (verify)  
 EMS FUNC - ΔV SET/VHF RNG  
 SET ΔV for SM BURN = ΔV pad  
 EMS FUNC - ΔV  
 S BD OMNI ANT - C

59:25  
 17 DSKY BLANKS

59:30  
 18 16 85 VG X,Y,Z (AVE G ON) (.1fps)  
 RHC's & THC - ARMED  
 TAPE RCDR - HBR/RCD/FWD/CMD RESET  
 EMS MODE - NORMAL

00:00  
 19 F 16 85 REQ NULL VG X,Y,Z (.1fps)  
 BURN EMS ΔV CTR TO ZERO

20 V82E

F 16 44 HA,HP,TFF (.1nm,min-sec)  
 Check HP <40nm:  
 If > Pad data, continue burn  
 until < Pad

PRO

- 21 F 16 85 VG X,Y,Z (.1fps)  
Read VG residuals to MSFN  
PRO
- 22 F 37 OOE  
When CMC ACTY lt out:  
V66E  
EMS FUNC - OFF  
EMS MODE - STBY  
MAN ATT (3) - MIN IMP  
TRANS CONT PWR - OFF  
SC CONT - SCS  
BMAG MODE (3) - RATE 2  
cb DIRECT ULLAGE (2) - open  
TAPE RCDR - off (ctr)  
PCM BIT RATE - LOW
- 23 EMS INITIALIZATION  
\*If scroll not on 37K:\*  
\* EMS FUNC - TEST 5 \*  
\* Slew scroll to 37K \*  
EMS FUNC - RNG SET  
Set RNG to PAD DATA RNG  
EMS FUNC - Vo SET  
Slew scroll to PAD DATA ViO  
EMS MODE - STBY (verify)  
EMS FUNC - ENTRY  
Verify .05G lt filter is down
- 24 RSI ALIGNMENT  
FDAI SOURCE - ATT SET  
ATT SET - GDC  
EMS ROLL - on (up)  
GDC ALIGN PB - PUSH & HOLD  
YAW tw - Position RSI to LIFT DN  
GDC ALIGN PB - RELEASE  
EMS ROLL - OFF  
ALIGN GDC TO IMU
- 25 MNVR TO CM/SM SEP ATT  
MAN ATT (3) - RATE CMD  
RATE - HIGH  
YAW left 45° from Burn Att (315°)  
BMAG MODE (3) - ATT 1/RATE 2

26

PWR REDUCT

MN BUS TIE (2) - ON  
 HGA PWR - OFF  
 FC PUMPS (3) - OFF  
 FC 2 MNA - OFF  
 Verify loads balanced  
 VHF AM (A&B) - off (ctr)  
 (5) cb ECS RAD CONT/HTR (2) - open  
 cb RAD HTRS OVLD (2) - open  
 cb WASTE H2O/URINE DUMP HTR (2)-open  
 POT H2O HTR - OFF  
 GLY EVAP TEMP IN - MAN

P61 - ENTRY PREP

27

V37E 61E (AVE G ON)  
 \*05 09 01427 - ROLL REVERSED\*  
 \*05 09 01426 - IMU UNSAT \*

28 F 06 61

IMPACT LAT, LONG, HDS UP/DN (+/-)  
 (.01°, .01°, ±00001)

## PAD VALUES

LAT \_\_\_\_\_  
 LONG \_\_\_\_\_  
 HDS UP +1 \_\_\_\_\_

PRO

29 F 06 60

GMAX, V400K, GAMMA EI (.01G, fps, .01°)

\*N60 not valid for \*  
 \* earth orbit Entry\*

PRO

30 F 16 63

RTOGO (.1nm) PAD \_\_\_\_\_  
 VIO (fps) PAD \_\_\_\_\_  
 TFE (min-sec)

\*RTOGO & VIO not valid for\*  
 \* earth orbit Entry \*

(ACCEPT) PRO  
 (RECYCLE) V32E to 29 (TFE accuracy is ±1 min)

P62 - CM/SM SEP & PRE-ENTRY MNVR

31 F 50 25 00041 REQUEST CM/SM SEP

cb ELS/CM-SM SEP (2) - close  
PRIM GLY TO RAD - BYPASS (verify)  
EMS MODE - STBY (verify)  
CM RCS LOGIC - on (up)  
Cue MSFN  
SECS LOGIC (2) - on (up)(verify)  
MSFN confirm GO for PYRO ARM (if poss)  
SECS PYRO ARM (2) - ARM  
MN BUS TIE (2) - ON (verify)

CM/SM SEP (2) - on (up)

\*If docking ring still on: \*  
\* cb CSM/LM FNL SEP (2) - close\*  
\* CSM/LM FNL 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  
CM RCS LOGIC - OFF  
Monitor V MNA/B:

\*If <25vdc go to EMERG POWER DOWN\*

YAW back to 0°  
MNVR to ENTRY ATT  
R 180° (Lift DN)  
P           
Y 0°  
MAINTAIN HORIZ TRACK

PRO (Act ENTRY DAP Att Hold)

32 F 06 61 IMPACT LAT, LONG, HDS UP  
(.01°, .01°, +00001)

PRO (CMC Guidance)

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

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P63 - ENTRY INIT

34 06 64 G,VI,RTOGO (.01G,fps,.1nm)  
FDAI SCALE - 5/5  
ROT CONTR PWR DIR (2)-MNA/MNB(verify)  
TAPE RCDR - HBR/RCD/FWD/CMD RESET  
HORIZ CK  
Pitch error needle goes toward  
zero approaching .05G time

P64 - ENTRY POST .05G

35 06 74 BETA, VI, G (.01°,fps,.01G)  
Start DAC

RTOGO AT .05G AGREES WITH EMS-verify  
HORIZ CK

.05G time  
(+0 : \_)  
( \_ : \_)

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

Track horiz with 9° window mk  
Maintain SCS control,  
Lift DN until 1G

Compare RSI & FDAI  
EMS GO/NO GO  
G-V Plot within limits

P67 - ENTRY - FINAL PHASE (0.2G)

36 06 66 BETA,CRSRNG ERR,DNRNG ERR (.01°, .1nm, .1nm)  
 (+ is north & long)  
 KEY VERB  
 Record DNRNG ERR \_\_\_\_\_  
 KEY RLSE  
 Limit: +100nm from PAD DRE  
 Monitor lift vector on RSI & FDAI

If CMC is GO:

MAN ATT (3) - RATE CMD

SC CONT - CMC

\*If DAP NO GO: \*

\* SC CONT - SCS \*

\* Fly BETA \*

\*If CMC NO GO: \*

\* SC CONT - SCS \*

\* Fly EMS \*

\*If after 1G, both RCS ring \*

\* He press <1650 psia: \*

\* Roll 20°/sec & disable RCS \*

\* After peak G, enable RCS \*

\* & fly BETA = 90° \*

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

SC CONT - SCS

RTOGO NEG - LIFT UP

RTOGO POS - LIFT DOWN

Monitor altimeter

Record LAT, LONG, & voice to RECY at 10K'

Record EMS RTGO

EMS MODE - STBY

EMS FUNC - OFF

Stop DAC

DAC - T8

DATE 3/7/72