

P20 - OPTIONS

- 0 - Rendz, VECPOINT, p. G/3-2
- 1 - Celestial body, VECPOINT, p. G/3-1
- 2 - Rotate, p. G/8-1
- 4 - Rendz, 3-axis, p. G/3-2
- 5 - Celestial body, 3-axis, p. G/3-1

P20 - UNIVERSAL TRACKING

Options 1 & 5 - Celestial Body  
 (1:VECPOINT; 5:3-axis)  
 CMC - on (req)  
 ISS - on and aligned (req)  
 BMAG MODE (3) - RATE 2

- 1 V37E 20E
- F 04 06 R1 00024 TRACKING OPTION  
 R2 00000  
 Load 1 or 5 in R2  
 PRO
- 2 F 06 78\* AXIS YAW, AXIS PITCH, OMICRON (.01°)  
 Load values (OMICRON ignored for opt 1)  
 Sim. Bay: 90°, 52.25°  
 OMICRON SEF: 180°  
 BEF: 0°  
 PRO
- 3 F 06 79\* R2 DEADBAND (.01°)  
 Load d.b.  
 PRO
- 4 F 01 70 R1 000DE STARCODE  
 Load code  
 PRO (DE ≠ 00 to 6)
- 5 F 06 88 CELESTIAL BODY VECTOR  
 Load vector  
 PRO

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6 (Req'd Mnv  $<10^\circ$ , to 7)  
F 50 18 MNVR request (.01°)

(AUTO) SC CONT - CMC  
CMC MODE - AUTO  
PRO

06 18 RPY (.01°) to 6 when MNVR complete

(MAN) RHC - MNVR to N18 angles

When att. acceptable

SC CONT - CMC  
CMC MODE - AUTO

ENTR

7 \*POSS UPLINK ACTY 1t \*  
\*(Mnv  $>10^\circ$  req'd) \*  
\*To reestablish F 50 18\*  
\* Key V58E \*

CMC continues tracking center of celestial body  
\*CMC will react to changes in N78 and N79 (May  
take 4 sec)

To terminate P20 - V56E

P20 - UNIVERSAL TRACKING

Options 0 & 4 - Rendezvous  
(0:VECPPOINT; 4:3-axis)

CMC - on (req)

ISS - on and aligned (req)

SCS - on (des)

BMAG MODE (3) - RATE 2

OPT ZERO - OFF

OPT MODE - MAN

G/N OPT PWR - on

OHC - Drive trun  $<10^\circ$

OPT ZERO - ZERO (15 sec)

OPT MODE - CMC

Note: For VHF RNG display  
see p G/1-20

- 1 V37E 20E
- F 04 06 R1 00024 TRACKING OPTION  
R2 00000  
Load 0 or 4 in R2  
PRO
- 2 F 06 78\* AXIS YAW, AXIS PITCH, OMICRON (.01°)  
Load values (OMICRON ignored for Opt. 0)  
PRO
- 3 F 06 79\* R2 DEADBAND (.01°)  
Load d.b.  
PRO  
(If required mnvr <10°, go to 5)
- 4 F 50 18 MNVR request (.01°)

(AUTO) SC CONT - CMC  
CMC MODE - AUTO  
PRO

06 18 RPY (.01°) to 4 when MNVR complete

(MAN) RHC - MNVR to N18 angles

When att. acceptable

SC CONT - CMC  
CMC MODE - AUTO

ENTR

- 5 \*POSS UPLINK ACTY 1t \*  
\*(Mnvr >10° req'd) \*  
\*To reestablish F 50 18\*  
\* Key V58E \*

OPT ZERO - OFF

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CMC continues LM attitude and optics tracking  
\*CMC will react to changes made to N78 and N79  
(May take 18 sec)

To start VHF marks - V87E (V88E to stop)  
MARK at will (Reject within 7 sec)

\*POSS F 06 49 ΔR, ΔV, source code\*  
\* (.01nm,.1fps,0000X)\*  
\*(REJECT) V32E \*  
\*(ACCEPT) PRO \*

For backup marks, see V54 (p G/1-26)

To terminate P20 - V56E  
OHC - Drive trun <10°  
OPT ZERO - ZERO  
G/N OPT PWR - OFF

Note: To display N49 for each measurement:

V1 N1E  
2002 E  
Rcrd: R1 \_\_\_\_\_  
V21 E  
2002 E  
77776 E

To return:  
V21 N1E  
2002 E  
Load previously recorded value  
P21 GROUND TRACK DETERMINATION  
CMC - on (req)

- 1 F 04 06 V37E 21E  
R1 00002, Specify Vehicle  
R2 00001, CSM  
or 00002, LM  
PRO
- 2 F 06 34 GET LAT, LONG (hrs,min,.01sec)  
Load desired GET (for present time, use  
all zeroes)  
PRO

3 F 06 43 LAT, LONG, ALT (.01°, .01°, .1nm)  
(RECYCLE) V32E to 2 (Increment GET 10 min)  
(EXIT) PRO

4 F 37 XXE

NOTE: Additional Information is available  
by V6 N73E  
N73 Alt, VEL, GAMMA(10nm, fps, .01°)

P22 - ORBITAL NAVIGATION

CMC - on (req)  
ISS - on and aligned (req)  
SCS - on (req)  
BMAG MODE (3) - RATE 2  
OPT ZERO - OFF  
OPT MODE - MAN  
G&N PWR OPTICS - on  
OHC - Drive trun <10°  
COUPLING - RESOLVED  
SPEED - MED  
OPT ZERO - ZERO (15 sec)  
OPT MODE - CMC  
To remove rate limit: V21N1E, 1341E, E

1 F 06 45 V37E 22E  
R3=MAX MGA (.01°)

(REJECT) R3 > 60° to P52  
R3 < 60° IMU ALIGNED  
MNVR To SIGHTING ATTITUDE  
Roll to keep shaft axis > 10° from  
plane defined by X axis & LOS to  
LMK (For 60nm alt, LMK > 10nm from  
gnd track requires no roll)

(MAN) OPT MODE - MAN  
OPT ZERO - OFF  
PRO (To 3 for earth orbit)  
(AUTO) OPT ZERO - OFF  
PRO (To 3 for earth orbit)

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- 2 F 05 70 (lunar orbit only)  
R2 ABCDE lmk code  
Load lmk code: SITE = 10001  
                  KNOWN = 10000  
                  UNKN = 20000  
          A=1(known), 2(unknown)  
          B=INDEX OF OFFSET designator  
          C=not used  
          DE=LMK ID (0,1, 5X are legal)  
          IF A=2, OPT MODE - MAN  
          PRO to 5  
or IF A=1 & DE≠00  
   PRO to 4 (To 5 if OPTICS - MAN)  
or IF A=1 & DE=00  
   PRO to 3
- 3 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
Load lmk coords  
PRO (To 5 if OPTICS - MAN)
- 4 06 92 SHAFT, TRUN NEW OCDU (.01°, .001°)  
          \*F 05 09 00404 (TRUN>90°)\*  
          \* MNVR to acquire \*  
          \* PRO \*  
          \* or V34E, F 37 \*  
Establish proper pitch rate  
OPTICS MODE - MAN
- 5 F 51 MARK REQUEST (Avoid lmk near horiz)  
MARK  
After sufficient MARKS:  
\*After 5 MARKS: \*  
\*F 50 25 00016 TERM MARKS\*  
PRO
- 6 F 05 71 R2 ABCDE LMK DATA  
Load lmk code (if nec)  
A=1 if KNOWN LMK  
A=2 if UNKNOWN LMK  
B=INDEX OF OFFSET DESIGNATOR  
      (If only 1 mark made, insure B=0)  
C=Not used in P22  
DE=LMK ID NO. (0,1 are valid)  
PRO - if A=2 (or A is 1 & DE = 01) to 8

7 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
PRO

8 F 06 49 ΔR, ΔV (SV PARA) (.01nm, .1fps)  
(RECYCLE) V32E to 2  
(ACCEPT) Hold for 30 sec  
PRO

9 F 06 89 LAT, LONG/2, ALT LMK ID (.001°, .001°, .01nm)  
(DON'T STORE) PRO to 2  
(STORE-CODE 01) V32E to 2  
(terminate Prog) V34E

10 F 37 XXE  
OHC - Drive trun <10°  
OPT ZERO - ZERO  
G/N PWR OPTICS - OFF  
To restore rate limit (CDU transient  
detection): V21N1E, 1341E, 5E

P23 - CISELUNAR MIDCOURSE NAV MEASUREMENT

CMC - on  
SCS - on  
ISS - on & aligned  
OPT ZERO - OFF  
OPT MODE - MAN  
G/N PWR OPTICS - on (30 min prior)  
OHC - Drive trun <10°  
OPT ZERO - ZERO (15 sec)  
OPT MODE - CMC

1 V37E 23E

2 F 50 25 R1 00015 ACQ CALIBRATION STAR  
(MAN MNVR) Mnvrv veh. to point LLOS at body  
ENTR to 7  
(AUTO MNVR) PRO

3 F 01 70 R1 000DE STAR CODE  
Load desired code  
PRO (to 5 if DE≠00)

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- 4 F 06 88 CELESTIAL BODY VECTOR  
Load desired vector  
PRO
- 5 F 50 18 REQUEST MNVR TO FDAI R,P,Y (.01°)  
(AUTO) SC CONT-CMC  
CMC MODE - AUTO  
BMAG MODE (3) -RATE 2  
PRO to 6  
(MAN) V62E  
MNVR to 5  
  
(BYPASS) ENTR to 7
- 6 06 18 AUTO MNVR FDAI R, P, Y (.01°)  
AUTO MNVR COMPLETE RETURN TO 5
- 7 F 59 REQUEST OPTICS CALIB  
(BYPASS) ENTR to 9  
(CALIB) OPT MODE - MAN  
OPT COUPLING - DIR  
SPEED - LOW  
OPT ZERO - OFF  
SUPERIMPOSE LLOS ON SLOS  
MARK
- 8 F 06 87 R2 TRUN BIAS (.001°)  
(Repeat until 2 measurements  
agree within .003°)  
For manual load:  
V22 N94E  
XXXXXE  
(RECALIB) MARK to 8  
(INCORP  
CALIB) PRO

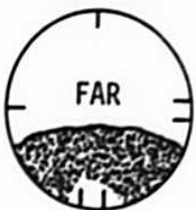


9 F 05 70

R1 000DE STAR ID  
R2 00C00 LMK ID  
R3 00CDO HOR ID



STAR/ENH	STAR/LNH	STAR/EL
000DE	000DE	000DE
00000	00000	00100
00110	00210	00000



STAR/EFH	STAR/LFH	STAR/LL
000DE	000DE	000DE
00000	00000	00200
00120	00220	00000

STAR/HOR PRO TO 12 (DE=00 to 11)  
STAR/LMK PRO

10 F 06 89

LAT, LONG/2, ALT (LMK)(.001° +N/E,.01nm)  
PRO (DE≠00 to 12)

11 F 06 88

CELESTIAL BODY VECTOR  
LOAD DESIRED VECTOR  
PRO

12 F 50 25

00202 3-AXIS MNVR REQUEST  
(3-AXIS) PRO  
(VECPPOINT)ENTR

13 F 50 18

REQUEST MNVR TO FDAI R,P,Y (.01°)  
(AUTO) SC CONT - CMC  
CMC MODE - AUTO  
BMAG MODE (3) - RATE 2  
PRO to 14  
(MAN) V62E  
MNVR to 13  
(BYPASS) OPT MODE - CMC  
OPT ZERO - OFF  
ENTR to 15

14 06 18

AUTO MNVR FDAI R, P, Y (.01°)  
AUTO MNVR COMPLETE RETURN TO 13

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G

3-10

- 15 06 92 AUTO OPT SHFT/TRUN (.01°, .001°)  
 (MNVR) V94E to 12  
 (MARK) MNVR SC TO POSITION LMK/HOR  
 IN FOV  
 OPT MODE - MAN
- 16 F 51 MARK REQUEST  
 (MNVR) V94E to 12  
 (MARK) SUPERIMPOSE STAR ON LMK/HOR  
 MARK
- 17 F 50 25 00016 TERM MARKS  
 (REJECT) MARK REJECT to 16 (Noun + R1 not  
 blanked)  
 (TERM) PRO
- 18 F 05 71 R1 000DE STAR ID  
 R2 00C00 LMK ID  
 R3 00C00 HOR ID  
  
 (STAR/HOR) PRO to 21 (DE=00 to 20)  
 (STAR/LMK) PRO to 19
- 19 F 06 89 LAT, LONG/2, ALT(LMK) (.001°+N/E, .01nm)  
 PRO (DE≠00 to 21)
- 20 F 06 88 CELESTIAL BODY VECTOR  
 Verify vector  
 PRO
- 21 F 06 49 ΔR, ΔV (SV PARA) (.01nm, .1 fps)  
 (REJECT) V37E 23E  
 (UPDATE) PRO

(To avoid auto mnvr. and auto optics  
 on subsequent passes: V25N7E, 77E,  
 10000E, E. To restore: V25N7E, 77E, 10000E,  
 1E)

- 22 F 37 XXE  
 OHC - Drive trun <10°  
 OPT ZERO - ZERO  
 G/N PWR OPTICS - OFF

DATE 3/15/72

P24 RATE-AIDED OPTICS TRACKING

CMC - on (req)  
 ISS - on and aligned  
 SCS - on  
 BMAG MODE (3) - RATE 2  
 OPT ZERO - OFF  
 OPT MODE - MAN  
 G&N PWR OPTICS - on  
 OHC - Drive trun <10°  
 OPT ZERO - ZERO (15 sec)  
 OPT MODE - CMC  
 TVC SERVO PWR 1 & 2 - OFF (verify)  
 GMBL MTRS (4) - OFF (verify)

1 V37E 24E

2 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
 LOAD LMK COORDS  
 OPT ZERO - OFF  
 MNVR to SIGHTING ATT  
 Roll to keep shaft axis > 10° from  
 plane defined by X-axis & LOS to  
 LMK (For 60nm alt, LMK > 10nm from  
 gnd track requires no roll)  
 PRO

3 06 92 AUTO OPT SHFT/TRUN (.01°, .001°)  
 \*F 05 09 00404 (TRUN >90°)\*  
 \* MNVR to acquire \*  
 \* PRO \*  
 \* or V34E, F 37 \*  
 OPTICS MODE - MAN

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- 4 F 51 MARK REQUEST  
MARK (as often as desired)  
To terminate:  
PRO
- 5 F 37 XXE  
OHC - Drive trun <10°  
OPT ZERO - ZERO  
G/N PWR OPTICS - OFF

P27 CMC UPDATE  
CMC - on (req)

Auto Update:

- 1 V37E 00E (Not nec. if P20 opt 1,2,5 in foreground)  
UP TLM (2) - ACCEPT  
UPLINK ACTY 1t - on  
\*POSS LOS before completion\*  
\*If V33 N02 showing: \*  
\* Key ENTR \*  
\* UPLINK ACTY 1t - out \*  
\* P00 or P20 displayed \*  
\*If V21 N01 \*  
\*or V21 N02 \*  
\* Key V34E \*  
\* UPLINK ACTY 1t - out \*  
\* P00 or P20 displayed \*  
\*UP TLM (MDC) - BLOCK \*

Update complete:

UPLINK ACTY 1t - out  
UP TLM (MDC) - BLOCK

Voice Transmission Update:

- 1 V37E 00E (Not nec. if P20 opt 1,2,5 in foreground)
- 2 V70E LIFT-OFF TIME UPDATE  
or V71E LOAD DATA CONSEC ADD  
or V72E LOAD DATA IN NON CONSEC  
or V73E CMC TIME UPDATE
- 3 P27 Displayed

- 4 F 21 01 R3 UPDATE BUFFER ADD (initially 304)  
R1 Data E (R3 Increments)  
(If change - To 6)  
Repeat Step 4 for all data
- 5 F 21 02 R3 330  
(Verify Data) V1 N1E  
R3 304E  
R1 Verify Data  
N15E (R3 305)  
R1 Verify Data  
Consecutive ENTR's display  
remaining comps. Note  
octal ident (01-24) of  
comps which need change  
KEY REL To 6
- 6 F 21 02 R3 330  
(CHANGE) Load octal ident, XXE to 4  
(ACCEPT UPDATE) Key Verb, then PRO
- 7 P00 or P20 Displayed
- P29 TIME OF LONGITUDE  
CMC-on (req)
- 1 V37E29E
- 2 F 04 06 R1 00002 Specify Vehicle  
R2 00001, CSM  
00002, LM  
PRO
- 3 F 06 34 GET BASE TIME (hrs,min,.01 sec)  
Load time from which  
CMC will begin search (all 0's for  
present time)  
PRO
- 4 F 06 43 R2 DESIRED LONG (.01°)  
Load long  
PRO

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- 5 F 06 34 GET LONG (hrs,min,.01 sec)  
 (Change long) V32E to 4  
 (see lat.) PRO
- 6 F 06 43 LAT, LONG, ALT (.01°, .01°, .1nm)  
 (Recycle) V32E to 2  
 (Term) PRO
- 7 F 37

P20 with GDC REFSMMAT

CMC - on (req)  
 IMU - off  
 GDC - on and REFSMMAT Known (pg G/7-13)  
 SCS - operating  
 OPT ZERO - OFF  
 OPT MODE - MAN  
 G/N OPT PWR - on  
 OHC - Drive trun <10°  
 OPT ZERO - ZERO (15 sec)  
 OPT MODE - CMC

- 1 V25N20E  
 Load present GDC angles
- 2 Perform P20 opt 4 (p. G/3-2)  
 Return after PRO on N79
- 3 Display desired att.  
 V16N18E (R,P,Y) (.01°)
- 4 Mvnr to Roll 0° or 180°, Yaw 0°  
 and Pitch shown in N18  
 V25N20E  
 Load present GDC angles
- 5 OPT ZERO - OFF  
 MARK (repeat as necessary)  
 \* POSS F 06 49 ΔR, ΔV, source code \*  
 \* (.01nm, .1fps, 0000X)\*  
 \* (REJECT) V32E \*  
 \* (ACCEPT) PRO \*

(To Terminate P20 - V56E  
 G/N OPT PWR - OFF)

P24 MARK BUTTON FAILED (Low Alt.)

CMC - on (req)  
ISS - on and aligned (req)  
OPT ZERO - OFF  
OPT MODE - MAN  
G&N PWR OPTICS - on  
OHC - Drive trun <10°  
OPT MODE - CMC  
OPT ZERO - ZERO (15 sec)  
SC CONT - CMC  
CMC MODE - AUTO  
TVC SERVO PWR 1&2 - OFF (verify)  
GMBL MTRS (4) - OFF (verify)

1 MNVR TO LMK TRK PAD ATT  
V49E

2 AUTO UPDATE:  
V37E00E  
UP TLM (2) - ACCEPT  
UPLINK ACTY 1t - on  
GND will uplink routine for  
failed MARK button (pg. G/3-17)

Update complete:  
UPLINK ACTY 1t - out  
UP TLM (MDC) - BLOCK  
\*DO NOT CALL: \*  
\*P21, P22, P23, P29 \*  
\*P3X, P4X, P5X, P6X, P7X\*

3 V5 N26E, verify:  
R1: 14000  
R2: 01603  
R3: 16067

4 V37E 20E

5 F 04 06 R1 00024 TRACKING OPTION  
R2 00000  
LOAD 2 in R2  
PRO

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- 6 F 06 78 AXIS YAW, AXIS PITCH, OMICRON (.01°)  
 LOAD: R1 +09000  
 R2 XXX.XX (LMK PAD ROLL ANGLE)  
 R3 +00000  
 PRO
- 7 F 06 79 RATE, DEADBAND (.0001°/sec,.01°)  
 LOAD: R1 -20000  
 R2 +00050  
 PRO
- 8 F 06 34 START TIME (hrs,min,.01 sec)  
 LOAD LMK PAD T2 TIME  
 PRO
- 9 V37E 24E  
 OPT ZERO - OFF  
 OPT TEL TRUN - SLAVE TO SXT  
 OPT COUPLING - RSLV  
 OPT SPEED - HI
- 10 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
 LOAD LMK COORDS  
 PRO
- 11 AT T2 -30 SEC: OPT MODE - MAN  
 V30E (Start erasable prog.)
- 12 F 53 BACKUP MARK REQUEST  
 PRO for MARK  
 ENTER for MARK REJ
- 13 TO TERMINATE PROGRAM:  
 V34E
- F 51  
 PRO
- 14 F 37



## FAILED MARK BUTTON MARKING ROUTINE

PURP	v 7 1				v 7 1				v 7 1			
	INDEX	2	4		INDEX	2	4		INDEX	1	5	
304 01	INDEX	2	4		INDEX	2	4		INDEX	1	5	
02	0 3	6 0	3		0 3	6 2	5		0 3	6 4	7	
03	3 1	6 6	1		0 0	0 0	6		0 1	6 5	2	
04	0 4	6 3	6		3 0	0 2	5		4 4	7 7	4	
05	2 6	0 3	6		5 2	3 5	5		6 1	7 5	3	
06	2 0	5 7	6		3 4	7 7	0		5 4	1 5	4	
07	0 2	0 5	2		0 5	2 2	3		0 0	0 0	6	
10	0 1	6 1	2		0 2	2 0	4		5 0	1 5	4	
11	0 1	6 3	4		0 1	6 0	3		4 1	5 4	0	
12	0 0	0 0	4		4 0	0 7	5		5 0	1 5	4	
13	3 0	0 3	6		7 4	7 6	5		5 3	5 4	0	
14	5 4	3 5	7		1 0	0 0	0		0 1	6 0	3	
15	3 0	0 3	5		0 1	6 0	3		1 5	2 0	0	
16	5 4	3 6	1		0 5	5 6	1					
17	3 0	0 3	3		0 0	0 3	2					
20	5 4	3 5	6		0 5	5 6	1					
21	3 0	0 3	4		0 0	0 5	2					
22	5 4	3 6	0		1 1	7 5	3					
23	3 0	0 3	2		0 1	6 5	0					
24	5 4	3 6	2		3 4	1 7	2					

DUE TO ERASABLE CONFLICTS, THE FOLLOWING PROGRAMS MUST NOT BE EXERCISED BETWEEN THE TIME THAT THE ERASABLE PROGRAM IS UPLINKED AND THE TIME THAT THE ERASABLE PROGRAM IS NO LONGER NEEDED: P21, P22, P23, P29, P3X, P4X, P5X, P6X, AND P7X.

P24 COAS MARKING (Hi Alt)

CMC - on (req)  
ISS - on and aligned  
G&N PWR OPTICS - OFF  
OPT ZERO - ZERO  
SC CONT - CMC  
CMC MODE - AUTO  
BMAG MODE (3) - RATE 2  
MAN ATT (3) - MIN IMP

1 MNVR TO LMK TRK PAD ATT  
V49E

2 AUTO UPDATE:  
V37E 00E

UP TLM (2) - ACCEPT  
UPLINK ACTY 1t - on

GROUND UPLINKS:

LMK POSITION IN RLS IF LMK NOT PRIME  
BACKUP MARK ROUTINE (pg G/3-20)

UPDATE COMPLETE:

UPLINK ACTY 1t - out  
UP TLM (MDC) - BLOCK  
\*DO NOT CALL: P21, P22, \*  
\*P23, P29, P3X, P4X, P5X, P6X, P7X\*

3 V5 N26E VERIFY N26:  
R1 14000  
R2 01603  
R3 16067

4 V24 N94E ALT LOS OPT ANGS SHAFT, TRUN  
(.01°, .001°)  
LOAD ANGLES  
(Nom: +0E, +57470E)

5 V25 N78E AXIS YAW, AXIS PITCH, OMICRON  
(.01°)  
+0E, +0E, +0E

6 V22 N79E DEADBAND (.01°)  
+50E

7 V37E 24E

8 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
LOAD LMK COORDS  
PRO

9 F 51 MARK REQUEST  
V21 N1E  
3374E  
OE ZERO R61CNTR

V44E SET SURFFLAG

V25 N7E  
75E  
1020E SET TRACKFLG AND LMTRG  
1E

10 F 50 18 *MANUALLY FLY ROLL TO ZERO FIRST*  
If MNVR < 10°, to 11 (.01°)  
MNVR REQUEST  
PRO  
When mnvr complete - ENTR

11 F 51 MARK REQUEST

V30E CALL ERASABLE PROG

12 F 53 BACKUP MARK REQUEST

13 AFTER ACQUISITION:  
CMC MODE - FREE  
TRACK LMK WITH RHC  
PRO for MARK  
ENTER for MARK REJ

14 TO TERMINATE PROG:  
V34E

F 51 V37E 00E  
V45E (RESET SURFFLAG)

*NOTE:  
PREFER SCS  
P in MIN IMPULSE  
REY RATE CMD E  
ATT 2/RATE 2*

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COAS MARKING ROUTINE

PURP		v	7	1	v	7	1	v	7	1						
304	01	INDEX	2	4	INDEX	2	4	INDEX	1	5						
	02	0	3	6	0	3	6	2	5	0	3	6	4	7		
	03	3	1	6	6	1	0	0	0	0	6	0	1	6	5	2
	04	0	4	6	3	6	3	0	0	2	5	4	4	7	7	4
	05	2	6	0	3	6	5	2	3	5	5	6	1	7	5	3
	06	2	0	5	7	6	3	4	7	7	0	5	4	1	5	4
	07	0	2	0	5	2	0	5	2	2	3	0	0	0	0	6
	10	0	1	6	1	2	0	2	2	0	4	5	0	1	5	4
	11	0	1	6	3	4	0	1	6	0	3	4	1	5	4	0
	12	0	0	0	0	4	4	0	0	7	5	5	0	1	5	4
	13	3	1	7	2	5	7	4	7	6	5	5	3	5	4	0
	14	5	4	3	5	7	1	0	0	0	0	0	1	6	0	3
	15	3	1	7	2	7	0	1	6	0	3	1	5	2	0	0
	16	5	4	3	6	1	0	5	5	6	1					
	17	3	0	0	3	3	0	0	0	3	2					
	20	5	4	3	5	6	0	5	5	6	1					
	21	3	0	0	3	4	0	0	0	5	2					
	22	5	4	3	6	0	1	1	7	5	3					
	23	3	0	0	3	2	0	1	6	5	0					
	24	5	4	3	6	2	3	4	1	7	2					

DUE TO ERASABLE CONFLICTS, THE FOLLOWING PROGRAMS MUST NOT BE EXERCISED BETWEEN THE TIME THAT THE ERASABLE PROGRAM IS UPLINKED AND THE TIME THAT THE ERASABLE PROGRAM IS NO LONGER NEEDED: P21, P22, P23, P29, P3X, P4X, P5X, P6X, and P7X.

P24 FROZEN OPTICS (Hi Alt)

1

Record frozen shaft and trun  
TPACS and voice to ground:

SHAFT \_\_\_\_\_  
TRUN \_\_\_\_\_

CMC - on (req)  
ISS - on and aligned  
G&N PWR OPTICS - ON  
OPT ZERO - OFF  
OPT MODE - MAN  
SC CONT - CMC  
CMC MODE - AUTO  
BMAG MODE (3) - RATE 2

2

MNVR TO LMK TRK PAD ATT  
V49E

3

AUTO UPDATE:  
V37E 00E  
UP TLM (2) - ACCEPT  
UPLINK ACTY 1t - on  
GROUND UPLINKS RLS  
UPDATE COMPLETE:  
UPLINK ACTY 1t - off  
UP TLM (MDC) - BLOCK

4

GROUND VOICES N78 PAD:  
YAW \_\_\_\_\_  
PITCH \_\_\_\_\_

5

V25 N78E AXIS YAW, AXIS PITCH, OMICRON  
(.01°)  
XXX.XXE  
XXX.XXE  
+0E

6

V22 N79E DEADBAND  
+50E

DATE 12/8/71

7 V37E 24E

8 F 06 89 LAT, LONG/2, ALT (.001°, .001°, .01nm)  
LOAD LMK COORDS  
PRO

9 F 51 MARK REQUEST  
V21 N1E  
3374E  
OE ZERO R61CNTR

V44E SET SURFFLAG

V25 N7E  
75E  
1020E SET TRACKFLG AND LMTRG  
1E

10 F 50 18 If MNVR <10°, to 11  
MNVR REQUEST (.01°)  
PRO  
When mnvr complete - ENTR

11 F 51 MARK REQUEST

12 AFTER ACQUISITION:  
CMC MODE - FREE  
TRACK LMK WITH MIC  
MARK as desired

13 TO TERMINATE PROG:  
V37E 00E  
V45E (RESET SURFFLAG)

MK BUTTON FAILED OPEN

May be used with P20,22,23,24,51 & 52

1

V25 N26E  
1E  
2165E  
16067E

2

When ready to mark (F 51):  
Key V31  
Use ENTR to mark (must be LEB DSKY)  
Use MK REJ to reject

Notes: As long as 31 remains in verb window,  
ENTR may be used to mark. This will  
be true in e.g. P24 unless MK REJ.  
In general MK REJ will place 51 in  
verb windows. V31 must then be rekeyed.