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Mission Techniques Memo #36

TO: Distribution
FROM: Malcolm W. Johnston
DATE: June 24, 1969
SUBJECT: Summary of "G" Mission Techniques Items

The enclosed list of action item subjects has been cross-referenced with the applicable Mission Techniques Memo # and Item # for ease of review.

Both the crew and the flight controllers at MSC will be given the opportunity to review some or all of these items, and to ask for clarification of any of the points mentioned.

Your comments and questions are solicited!

Malcolm W. Johnston

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0663

only if you get rid of alarm light

V 32 E
V 37 N 1 E
107 E, 40,000 E

## EPO/TLI

MTM#/Item#

21/1 Manual TLI Takeover ....DAP initialization, rate stick, etc.

25/2 Post TLI ( LOI) abort review (also 14/6, 14/8)

## TRANSLUNAR (LOI)

10/16 P23 operation, sxt calibration, $\Delta R/\Delta V$ threshold, horizon bias etc. (also 10/1-10/5)

26/5 RR routines can be used to track SIVB after separation

22/6 P30 recommended for perilune determination during cis-lunar coast

24/2 Lunar sphere problems (burns near LSOI etc) now nonexistent (also 22/1)

26/1 LGC Calcmanu alarms if final MGA $>70^{\circ}$, no alarm in CMC

26/7 Maximum recommended MGA during LM or CSM burns = $70^{\circ}$!

9/4 Gyro drift and pipa bias compensation update and fail limits (also 22/7)

10/8 W-matrix re-initialization and synchronization (also 10/9, 10/10, 22/5, 26/3)

## LUNAR ORBIT (DOI)

30B/8 A V89 (X-axis option) will orient CSM towards LM on surface

23/26 Orb Rate and PTC DAP procedures (also 18/1 & "F" changes)

23/19 LGC power failures

23/11 R03 may be called after a premature LGC P40 shutdown and then N85 (VG) returned

8/9 DOI residual nulling (if any) should be quickly accomplished

23/7 Pre-PDI LR tests via R77 and post PDI "smart" reactions (also 23/15, 28B/1, 28C/6)

10/13 V83 should not be used during precision integration above 425 NM. (also 14/10)

19/2 V83 accuracy for RR test in mini-football

23/5 V83 can be used by CSM to determine when over LM on surface (also 23/27)

29A/2 Pre-DOI alignment technique (RW's) & Pre-PDI suncheck? (29B/5)

29A/1 Pre-DOI PGNCS pipa bias compensation adjustment

23/33 Pre-PDI gyro drift compensation update (2nd rev PDI) limit

32/3 P22 operational ground rules (25 secs apart, etc.)

J. NEVINS - P23 backup

RLS call FOD

## DESCENT

MTM#/Item#

29B/3 Landing abort anomaly #77 - rope being fixed
28A Descent guidance and control options summary by G. Cherry
29A/6 PDI aborts utilizing P30/40 ....ΔV unshared, TIG must be loaded
28B/3 PDI thrust fail indication . . . place direct thrust on . . . proceed
1/6 Late PDI is absorbed (reducing trim time) up to "zoomtime" (26 secs)
29A/11 P12, 70 & 71 guided steering has two thrust thresholds . . very low & 60%
28B/2 LR fails to switch position at hi-gate .. V32 option prog. alarm (See 28C/1)
23/23 P42 may now be called before staging (See PCR #648)
29A/8 P12, 70 & 71 clear RR self track enable (no track light on) when average G off
28C/2 Initialization of the ignition algorithm via TLAND can be coarse
28C/3 AGS initialization (R 47) can be called during descent
28C/5 Restart occurring between PDI and FTP requires work-a-round (LNY #64)
29B/1 Abort criteria . . Throttle level, P63-P64 TGO, throttle recovery, LR data, etc.
29B/2 N=8 CSI solution will work. TPI time must be compatible
29B/6 GDA Failure procedures (impingement no longer constraining! ?)
29B/4 PGNCS/LEAR/AGS monitoring techniques and fail limits (also 9/1)

## SURFACE

30A/2 Disable possible jet firings after TD/before P57 via V76 & Att. Hold (Live stick)
30A/3 When not being used for other purposes leave LGC in P00
30A/5 P57 RLS altitude load is incremental from previous RLS
30A/6 P12 gets lift-off time from Talign of last P57
30A/7 P12 P&Y pitch over angle display is a delta angle
30A/10 P57 gravity option indicates tilt from vertical (1st time), then settling
8/4 P52 to L.S. will not overwrite a post insertion LM state previously sent to CMC
8/2 LM state, either vehicle, not periodically updated in P00 with Surf flag set
30B/1 Sun, Earth, Moon P57 option does not work always (See LNY #74)
30B/2 Sight on crescent earth via two marks on each terminator/horizon intersection
30B/3 LM can determine when CSM overhead via P22, P00, &R04 range rate reversal
30A/8-9 Inertial systems test while on surface . . particularly gyro drift and pipa bias

see sklet

Put in G+N VICT

## ASCENT

MTM#/Item#

33 Manual ascent ( & aborts from descent) with partially failed PGNCS & AGS

31/1 4 jet +x RCS supplemental thrust is available via THC

31/2 Ascent guidance is independent of launch IMU alignment

## RENDEZVOUS

29A/7 Post insertion residual display accuracy degrades rapidly

23/14 V67 loads R, V, and RR bias now!

23/24 R36 displays vehicle's out-of-plane velocity, therefore, change sign for burn (once!)

23/8 CMC does not inhibit VHF at ranges greater than 320 NM . . counts over

23/6 E/N are shared erasables . . cannot be loaded pre-launch

23/30 General and non-nominal rendezvous ground rules (also 23/28, 23/29)

## TRANSEARTH (TEI)

24/4 C Prime type P37 targetting corrections no longer necessary

12/3 Post TEI P52 (comm loss) to entry alignment

25/1 "No Comm" TE MCC's should use P37 - P40/41 sequence . . not P30!

35/2 TEI performance while pushing an empty Ascent stage

26/6 E/H SXT sightings to EI - 1 hr improve R dot considerably

24/1 MSFN should update state vectors every 12 hrs.

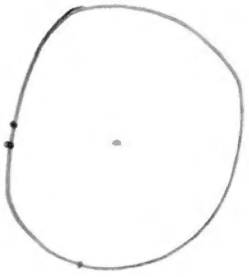
## ENTRY

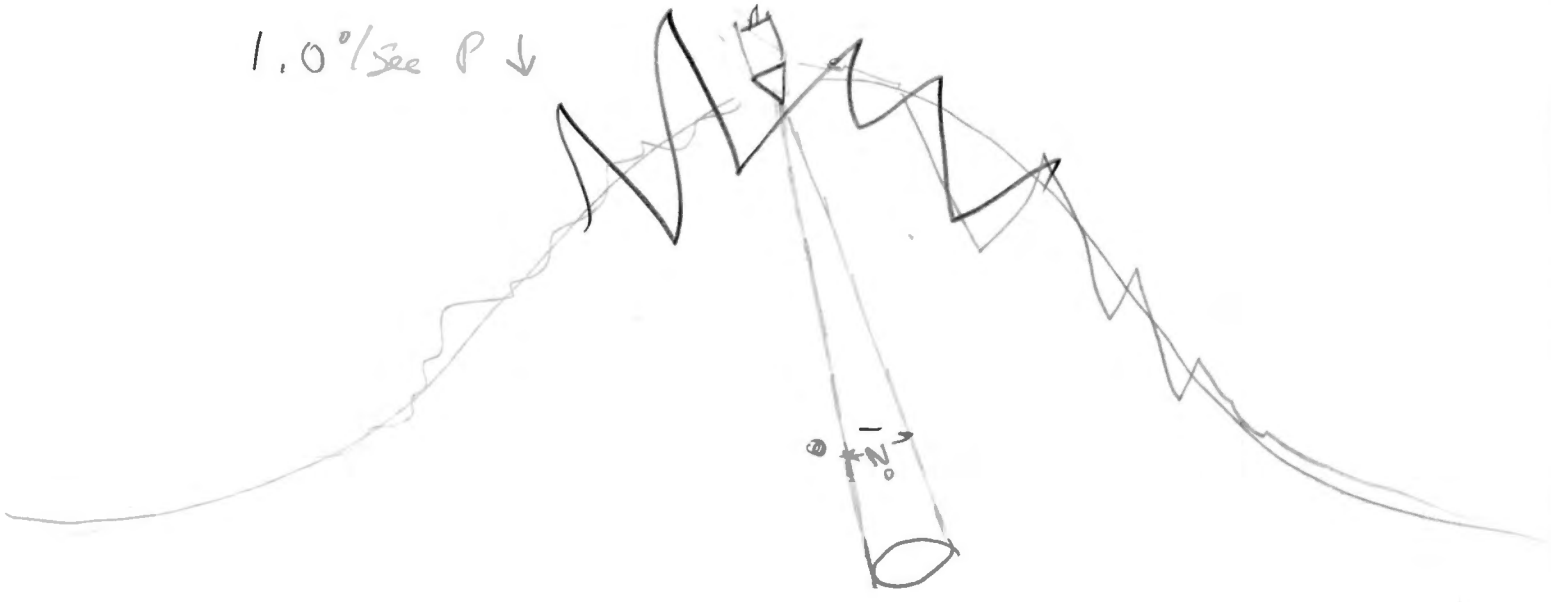
12/7 IMU coarse align accuracy ($2^{o}$) not adequate for entry

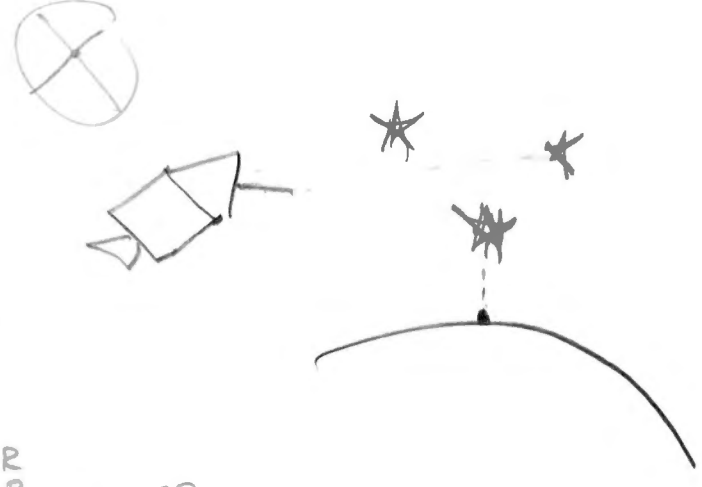
26/4 MIT prefers 2 ring authority for super-circular entries

(John C/W Lewis
2 fuel

3 ✱
9 ✱





I/C { R P Y

Br. ✱ CALIB { R P Y

✱1 SIS Pt { R P Y