

FINAL



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS 77058

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MAR 26 1970 R. A. LAPSON

IN REPLY REFER TO: 70-FS55-78

MEMORANDUM TO: Apollo Spacecraft Program Office
Attention: PD7/Richard H. Kohrs

FROM : FS/Chief, Flight Support Division

SUBJECT : Final Apollo 13 (Mission H2) prelaunch erasable load
(LML31 Rev 1)

1. Enclosure 1 consists of the final values for the parameters in the Apollo 13 (Mission H2) prelaunch erasable load for the LGC.
2. The number to the left of the parameter mnemonic denotes the number of revisions to the value of the corresponding parameter that have been incorporated in publications of the Apollo 13 erasable load.
3. A single or double star (* or **) next to a parameter mnemonic denotes that it is also in the inflight erasable load. These parameters would have to be verified or reloaded in order to completely initialize the LGC in orbit. A single star denotes loading by ground uplink; a double star denotes loading by the astronaut via the DSKY.
4. Enclosure 2 is the inflight erasable load in uplink format. All values in the inflight erasable load are consistent with the values in the prelaunch erasable load.
5. Enclosure 3 consists of planned changes to the Apollo 13 erasable load, with values when known.
6. Questions or comments regarding erasable loads should be directed to Mr. J. W. Jurgensen, extension 2111.


Linwood C. Dunseith

Enclosures 3

FS55:JWJurgensen:jvm

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1*

| REV | MNEMONIC | ADDR | OCIAL | SE | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|------------|------|-------|-------|------------------------|--------------------------|
| | FLAGWRD7+ | 0 | 0077 | 12000 | -0 | |
| 1 | FLAGWRD8+ | 0 | 0104 | 06000 | -0 | |
| | FLAGWRD10+ | 0 | 0106 | 00000 | -0 | |
| | MASS | + 0 | 1243 | 07401 | 16 3.387230000+004 LBS | 1.536421683+004 KGS |
| | MASS | + 1 | 1244 | 00000 | 0 0.000000000+000 LBS | 0.000000000+000 KGS |
| 1** | LEMMASS | + 0 | 1326 | 07401 | 16 3.387230000+004 LBS | 1.536421683+004 KGS |
| 1** | CSMASS | + 0 | 1327 | 10246 | 16 3.758030000+004 LBS | 1.704613734+004 KGS |
| * | E3J22R2M+ | 0 | 1347 | 12160 | 58 0.204790479+016 | 9.204790479+016 M5/CS2 |
| * | E32C31RM+ | 0 | 1350 | 03363 | 80 1.312892560+023 | 1.312892560+023 M6/CS2 |
| * | RADSKAL | + 0 | 1351 | 00000 | 21 0.000000000+000 | 0.000000000+000 LRB/M/CS |
| | | | 1352 | 00000 | | |

UNITS ARE LB LOW SCALE ALTITUDE BITS/METER/CS

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|----------|-------|----|---------------------|---------------------|
| * | SKALSKAL+ | 0 1353 | 00000 | 0 | 0.000000000+000 | 0.000000000+000 |
| 2 * | FLPTAS | + 0 1356 | 00044 | -1 | 4.000000000-001 DEG | 1.111111111-003 REV |
| 1 * | PBIASY | + 0 1452 | 03641 | -3 | 1.490020752-004 | 1.490020752-002 |
| 1 * | PIPASCEX+ | 0 1453 | 64417 | -9 | | -6.999969482-004 |
| 1 * | PBIASY | + 0 1454 | 74272 | -3 | -1.419830322-004 | -1.419830322-002 |
| 1 * | PIPASCEY+ | 0 1455 | 54401 | -9 | | -1.189947128-003 |
| 1 * | PRTAS7 | + 0 1456 | 03775 | -3 | 1.560211182-004 | 1.560211182-002 |
| 1 * | PIPASCEZ+ | 0 1457 | 72727 | -9 | | -7.099441528-004 |
| 1 * | NRDX | + 0 1460 | 00063 | -5 | | 9.727478027-005 |
| 1 * | NRDY | + 0 1461 | 00015 | -5 | | 2.479553223-005 |
| 1 * | NRDZ | + 0 1462 | 77762 | -5 | | -2.479553223-005 |
| 1 * | ADTAX | + 0 1463 | 77627 | -6 | | -9.918212890-005 |
| 1 * | ADTAY | + 0 1464 | 00202 | -6 | | 1.239776611-004 |

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1*

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--------------------------|----|-------------------|-------------------------|
| 1 * | ADIAZ | + 0 | 1465 77713 | -6 | | -4.950106445-005 |
| 1 * | ADSRAX | + 0 | 1466 77745 | -6 | | -2.479553223-005 |
| 1 * | ADSRAY | + 0 | 1467 00266 | -6 | | 1.735687256-004 |
| 1 * | ADSRAZ | + 0 | 1470 00000 | -5 | | 0.000000000+000 |
| * | GCCMP5W | + 0 | 1477 00000 | -0 | | |
| | TETCSM | + 0 | 1570 37777 | -0 | | |
| | TETLEM | + 0 | 1642 37777 | -0 | | |
| * | X789 | + 0 | 1700 00000 1701 00000 | 5 | 0.000000000+000 | 0.000000000+000 RADIANS |
| * | X789 | + 2 | 1702 00000 1703 00000 | 5 | 0.000000000+000 | 0.000000000+000 RADIANS |
| * | X789 | + 4 | 1704 00000 1705 00000 | 5 | 0.000000000+000 | 0.000000000+000 RADIANS |

FINAL H2 PRELAUNCH FRASABLE LOAD ≥LM131A REV 1A

| REV | MNEMONIC | ADDR | OCTAL | SE | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--|----|---------------------|---------------------|
| 1 * | TEPHEM | + 0 | 1706 00011 1707 05253 1710 33560 | 42 | 2.460678000+007 | 2.460678000+009 CS |
| 1 * | AZO | + 0 | 1711 30623 1712 37367 | 0 | 2.788765975+002 DEG | 7.746572159-001 REV |
| 1 * | -AYC | + 0 | 1713 00000 1714 23066 | 0 | 1.311868428-002 DEG | 3.644078970-005 REV |
| 1 * | AXC | + 0 | 1715 00000 1716 26474 | 0 | 1.552999018-002 DEG | 4.313886166-005 REV |
| 2 | REFSMMAT+ | 0 | 1733 11227 1734 03621 | 1 | 5.809470490-001 | 5.809470490-001 |
| 2 | REFSMMAT+ | 2 | 1735 64303 1736 76432 | 1 | -7.260797396-001 | -7.260797396-001 |

FINAL H2 PRELAUNCH ERASABLE LOAD >LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|---------------------|----|-------------------|--------------------|
| 2 | REFSMMAT+ 4 | 1737 | 72072 1740 64034 | 1 | -3.678434119-001 | -3.678434119-001 |
| 2 | REFSMMAT+ 6 | 1741 | 77664 1742 50201 | 1 | -9.245857596-003 | -9.245857596-003 |
| 2 | REFSMMAT+ 8 | 1743 | 70531 1744 72041 | 1 | -4.577863067-001 | -4.577863067-001 |
| 2 | REFSMMAT+10 | 1745 | 16162 1746 31571 | 1 | 8.890141919-001 | 8.890141919-001 |
| 2 | REFSMMAT+12 | 1747 | 62764 1750 63727 | 1 | -8.138888478-001 | -8.138888478-001 |
| 2 | REFSMMAT+14 | 1751 | 67624 1752 76002 | 1 | -5.130691305-001 | -5.130691305-001 |
| 2 | REFSMMAT+16 | 1753 | 73506 1754 53045 | 1 | -2.726628333-001 | -2.726628333-001 |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SE | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|----------|------------|-----|--------------------------|-------------------------|
| * | RANGEVAR+ | 0 1770 | 01351 | -12 | 1.111111111-005 | 1.111111111-005 |
| | | | 1771 24734 | | | |
| * | RATEVAR | + 0 1772 | 02354 | -12 | 1.877777000-005 | 1.877777000-005 |
| | | | 1773 04750 | | | |
| * | RVARMIN | + 0 1774 | 00410 | 12 | 7.104180875+002 FT2 | 6.600000000+001 M2 |
| * | VVARMIN | + 0 1775 | 00165 | -12 | 1.877764172-001 FT2/SEC2 | 1.744500000-006 M2/CS2 |
| * | WRENCPCS+ | 0 2000 | 05750 | 14 | 1.000000000+004 FT | 3.048000000+003 M |
| * | WRENDVEL+ | 0 2001 | 00763 | 0 | 1.000000000+001 FT/SEC | 3.048000000-002 M/CS |
| * | WSHAFT | + 0 2002 | 17270 | -5 | 1.500000000+001 MILLIRAD | 1.500000000-002 RADIANS |
| * | WTRUN | + 0 2003 | 17270 | -5 | 1.500000000+001 MILLIRAD | 1.500000000-002 RADIANS |
| * | RMAX | + 0 2004 | 00023 | 19 | 2.000000000+003 FT | 6.096000000+002 M |
| * | VMAX | + 0 2005 | 00001 | 7 | 2.000000000+000 FT/SEC | 6.096000000-003 M/CS |
| * | WSUREPOS+ | 0 2006 | 00000 | 14 | 0.000000000+000 FT | 0.000000000+000 M |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|-----|--------------------------|--------------------------|
| * | WSURFVEL+ | 0 | 2007 00000 | 0 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| * | SHAFTVAR+ | 0 | 2010 00103 | -12 | 1.000000000+000 MILIRAD2 | 1.000000000-006 RADIANS2 |
| * | TRUNVAR | + 0 | 2011 00103 | -12 | 1.000000000+000 MILIRAD2 | 1.000000000-006 RADIANS2 |
| 1 * | 504LM | + 0 | 2012 77772 2013 46750 | 0 | -3.529451787-004 | -3.529451787-004 |
| 1 * | 504LM | + 2 | 2014 77773 2015 57473 | 0 | -2.753883600-004 | -2.753883600-004 |
| 1 * | 504LM | + 4 | 2016 00006 2017 06361 | 0 | 3.785528243-004 | 3.785528243-004 |
| * | AGSK | + 0 | 2020 04225 2021 10400 | 28 | 1.000000000+002 HR | 3.600000000+007 CS |
| 2 * | PLS | + 0 | 2022 00311 2023 31177 | 27 | 5.423410433+006 | 1.653055500+006 M |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--------------------------|----|-------------------------|-----------------------|
| 2 * | RLS | + 2 | 2024 77700 2025 55774 | 27 | -1.708351378+006 | -5.207055000+005 M |
| 2 * | RLS | + 4 | 2026 77762 2027 55732 | 27 | -3.645751312+005 | -1.111225000+005 M |
| 3 * | TLAND | + 0 | 2400 04347 2401 20441 | 28 | 1.037433811+002 HP | 3.734761720+007 CS |
| * | RRREG | + 0 | 2402 77776 2403 76044 | 24 | -3.562050000+003 FT | -1.085712840+003 M |
| * | RRREG | + 2 | 2404 00000 2405 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| * | RRREG | + 4 | 2406 77773 2407 75347 | 24 | -1.370571000+004 FT | -4.177500408+003 M |
| * | VRREG | + 0 | 2410 77766 2411 74245 | 10 | -1.869030500+002 FT/SEC | -5.696804964-001 M/CS |

FINAL H2 PRELAUNCH EPASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|----------|----------|------|-------|----|--------------------------|------------------------|
| * VBRFG | + 2 | 2412 | 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| | | 2413 | 00000 | | | |
| * VBRFG | + 4 | 2414 | 77773 | 10 | -9.873819000+001 FT/SEC | -3.009540031-001 M/CS |
| | | 2415 | 45722 | | | |
| * ABRFG | + 0 | 2416 | 77774 | -4 | -4.502495000-001 FT/SEC2 | -1.372360476-005 M/CS2 |
| | | 2417 | 54701 | | | |
| * ABRFG | + 2 | 2420 | 00000 | -4 | 0.000000000+000 FT/SEC2 | 0.000000000+000 M/CS2 |
| | | 2421 | 00000 | | | |
| * ABRFG | + 4 | 2422 | 77663 | -4 | -9.515097500+000 FT/SEC2 | -2.900201718-004 M/CS2 |
| | | 2423 | 77104 | | | |
| * VBRFG* | + 0 | 2424 | 77765 | 13 | -1.777287420+003 FT | -5.417172056+000 |
| | | 2425 | 45231 | | | |
| * ABRFG* | + 0 | 2426 | 77067 | -4 | -5.709058500+001 FT/SEC2 | -1.740121031-003 M/CS2 |
| | | 2427 | 72634 | | | |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1*

| REV | MNEMONIC | ADDR | OCTAL | SE | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|--------------------------|------------------------|
| | * JBPFG* | + 0 | 2430 77545 2431 63177 | -21 | -1.474273600-002 FT/SEC3 | -4.493585933-009 M/CS3 |
| 1 | * GAINBPAK+ | 0 | 2432 37777 2433 37777 | 0 | 9.999999963-001 | 9.999999963-001 |
| | * TCGFBPAK+ | 0 | 2434 00567 | 17 | 3.000000000+001 SEC | 3.000000000+003 CS |
| | * TCGIBPAK+ | 0 | 2435 25762 | 17 | 9.000000000+002 SEC | 9.000000000+004 CS |
| | * RAPFG | + 0 | 2436 00000 2437 00624 | 24 | 8.292750000+001 FT | 2.527630200+001 M |
| | * RAPFG | + 2 | 2440 00000 2441 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| | * RAPFG | + 4 | 2442 77777 2443 77635 | 24 | -2.016050000+001 FT | -6.144920400+000 M |
| | * VAPFG | + 0 | 2444 77777 2445 77400 | 10 | -3.190000000-001 FT/SEC | -9.723120000-004 M/CS |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|----------|----------|------|-------|----|--------------------------------------|------------------------------------|
| * VAPEG | + 2 | 2446 | 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| | | 2447 | 00000 | | | |
| * VAPFG | + 4 | 2450 | 00000 | 10 | 3.123300000-001 FT/SEC | 9.519818400-004 M/CS |
| | | 2451 | 00372 | | | |
| * AAPFG | + 0 | 2452 | 00002 | -4 | 2.998200000-001 FT/SEC ² | 9.138513600-006 M/CS ² |
| | | 2453 | 14522 | | | |
| * AAPFG | + 2 | 2454 | 00000 | -4 | 0.000000000+000 FT/SEC ² | 0.000000000+000 M/CS ² |
| | | 2455 | 00000 | | | |
| * AAPFG | + 4 | 2456 | 77774 | -4 | -4.016500000-001 FT/SEC ² | -1.224229200-005 M/CS ² |
| | | 2457 | 71233 | | | |
| * VAPFG* | + 0 | 2460 | 00000 | 13 | 5.621940000+000 FT/SEC | 1.713567312-002 M/CS ² |
| | | 2461 | 01062 | | | |
| * AAPFG* | + 0 | 2462 | 77754 | -4 | -2.409900000+000 FT/SEC ² | -7.345375200-005 M/CS ² |
| | | 2463 | 67646 | | | |

FINAL H2 PRELAUNCH EPASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|-------------------------|-----------------------|
| | * JAPFG* | + 0 | 2464 00612 2465 30722 | -21 | 3.769542000-002 FT/SEC3 | 1.148956402-008 M/CS3 |
| | * GAINAPPR+ | 0 | 2466 00000 2467 00000 | 0 | 0.000000000+000 | 0.000000000+000 |
| | * TCGFAPPR+ | 0 | 2470 00113 | 17 | 6.000000000+000 SEC | 6.000000000+002 CS |
| | * TCGIAPPR+ | 0 | 2471 04704 | 17 | 2.000000000+002 SEC | 2.000000000+004 CS |
| 2 | * VIGN | + 0 | 2472 00416 2473 15755 | 10 | 5.545364400+003 FT/SEC | 1.690227069+001 M/CS |
| 2 | * RIGNX | + 0 | 2474 77730 2475 51505 | 24 | -1.333715400+005 FT | -4.065164539+004 M |
| 2 | * RIGNZ | + 0 | 2476 77121 2477 73554 | 24 | -1.445069500+006 FT | -4.404571836+005 M |
| | * KIGNX/B4+ | 0 | 2500 77255 2501 41625 | 4 | -3.310000000-001 | -3.310000000-001 |

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1*

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|-----|-------------------------|--------------------------|
| * | KIGNY/P8+ | 0 | 2502 73754 2503 52751 | -16 | -5.869400000-007 FT/FT2 | -1.925656168-006 M-1 |
| * | KIGNV/P4+ | 0 | 2504 72516 2505 57777 | 18 | -4.380000000+002 SEC | -4.380000000+004 CS |
| * | LOWCRIT + | 0 | 2506 04114 | 14 | 5.985000000+003 LRF | 2.124374401+003 DPSTROTP |
| * | HIGHCRIT+ | 0 | 2507 04454 | 14 | 6.615000000+003 LRF | 2.347992759+003 DPSTROTP |
| 1 * | TAUHZ | + 0 | 2510 07640 | 11 | 5.000000000+000 SEC | 5.000000000+002 CS |
| 1 * | QHZ | + 0 | 2511 14632 | 0 | 4.000244141-001 | 4.000244141-001 |
| 1 * | AHZLIM | + 0 | 2512 00017 | -4 | 1.877311646+000 FT/SEC2 | 5.722045898-005 M/CS2 |
| 1 * | TOCFEW | + 0 | 2513 00003 | 14 | | 3.000000000+000 |
| 1 * | HLROFF | + 0 | 2514 00000 2515 00364 | 24 | 5.003280840+001 FT | 1.525000000+001 M |
| 1 * | 2LATE466+ | 0 | 2516 00000 2517 00226 | 28 | 1.500000000+000 SEC | 1.500000000+002 CS |

FINAL H2 PRELAUNCH ERASABLE LOAD >LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--------------------------|----|------------------------|----------------------|
| 4 * | DELOFIX | + 0 | 2520 00000 2521 01717 | 24 | 2.000000000+002 FT | 6.096000000+001 M |
| * | LRALPHA | + 0 | 2522 01042 | -1 | 6.000000000+000 DEG | 1.666666668-002 REV |
| * | LRBETA1 | + 0 | 2523 04211 | -1 | 2.400000000+001 DEG | 6.666666672-002 REV |
| * | LRALPHA2 | + 0 | 2524 01042 | -1 | 6.000000000+000 DEG | 1.666666668-002 REV |
| * | LRBETA2 | + 0 | 2525 00000 | -1 | 0.000000000+000 DEG | 0.000000000+000 REV |
| * | LRVMAX | + 0 | 2526 01414 | 7 | 2.000000000+003 FT/SEC | 6.096000000+000 M/CS |
| * | LRVF | + 0 | 2527 00116 | 7 | 2.000000000+002 FT/SEC | 6.096000000-001 M/CS |
| * | LRWVZ | + 0 | 2530 11463 | 0 | 3.000000000-001 | 3.000000000-001 |
| * | LRWVY | + 0 | 2531 11463 | 0 | 3.000000000-001 | 3.000000000-001 |
| * | LRWVX | + 0 | 2532 11463 | 0 | 3.000000000-001 | 3.000000000-001 |
| * | LRWVFZ | + 0 | 2533 06315 | 0 | 2.000000000-001 | 2.000000000-001 |
| * | LRWVFY | + 0 | 2534 06315 | 0 | 2.000000000-001 | 2.000000000-001 |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SE | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|------------------------|--------------------------|
| * | LRWVFX | + 0 | 2535 06315 | 0 | 2.000000000-001 | 2.000000000-001 |
| * | LRWVFF | + 0 | 2536 03146 | 0 | 1.000000000-001 | 1.000000000-001 |
| * | RODSALE+ | 0 | 2537 14370 | -7 | 1.000000000+000 FT/SEC | 3.048000000-003 M/CS |
| * | TAURCD | + 0 | 2540 11300 2541 00000 | 9 | 1.500000000+000 SEC | 1.500000000+002 CS |
| * | LAG/TAU | + 0 | 2542 15164 2543 01420 | 0 | 4.133330000-001 | 4.133330000-001 |
| * | MINFORCE+ | 0 | 2544 00001 2545 27631 | 12 | 9.800000000+002 LBF | 4.359257183-001 KG M/CS2 |
| * | MAXFORCE+ | 0 | 2546 00013 2547 06551 | 12 | 6.300000000+003 LBF | 2.802379617+000 KG M/CS2 |
| 1 * | J1PARM | + 0 | 2550 07015 2551 12075 | 23 | 6.042735000+006 FT | 1.841825902+006 M |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|-------------------------|------------------------|
| 1 * | K1PARM | + 0 | 2552 75534 2553 64200 | 23 | -3.174389100+005 FT/RAD | -6.079319804+005 M/REV |
| 1 * | J2PARM | + 0 | 2554 07017 2555 31511 | 23 | 6.046910400+006 FT | 1.843098290+006 M |
| 1 * | K2PARM | + 0 | 2556 73337 2557 66560 | 23 | -6.245998500+005 FT/RAD | -1.196180467+006 M/REV |
| 1 * | THETCRIT+ | 0 | 2560 76361 2561 77023 | 0 | -1.718327700+001 DEG | -4.773132504-002 REV |
| 1 * | RAMIN | + 0 | 2562 03326 2563 13475 | 24 | 5.880484940+006 FT | 1.792371810+006 M |
| * | YLIM | + 0 | 2564 00016 2565 32446 | 24 | 8.200000000+000 N.MI. | 1.518640000+004 M |
| * | APTRDOT | + 0 | 2566 00007 2567 23346 | 7 | 1.950000000+001 FT/SEC | 5.943600000-002 M |

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1*

| REV | MNEMONIC | ADDR | OCIAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|---------------------|--------------------|
| * | COSTHET1+ | 0 | 2570 00000 2571 00000 | 2 | 0.000000000+000 | 0.000000000+000 |
| * | COSTHET2+ | 0 | 2572 06733 2573 07535 | 2 | 8.660254037-001 | 8.660254037-001 |
| * | DLAND | + 0 | 2634 00000 2635 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| * | DLAND | + 2 | 2636 00000 2637 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| * | DLAND | + 4 | 2640 00000 2641 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| * | HIASCENT+ | 0 | 3000 02324 | 16 | 1.090000000+004 LPS | 4.944156833+003 KG |
| 1** | ROLLTIME+ | 0 | 3001 05454 | 14 | 2.860000000+001 SEC | 2.860000000+003 CS |
| 1** | PITTIME | + 0 | 3002 04513 | 14 | 2.379000000+001 SEC | 2.379000000+003 CS |

FINAL H2 PRELAUNCH ERASABLE LOAD >LM131A REV 1*

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|----------|-------|----|--------------------------|--------------------------|
| * | DKTRAP | + 0 3003 | 77001 | -3 | -3.888888889-003 | -3.888888889-003 REV/SEC |
| * | DKMEGAN+ | 0 3004 | 00012 | 14 | 1.000000000+001 | 1.000000000+001 |
| * | DKKACSN | + 0 3005 | 00074 | 14 | 6.000000000+001 | 6.000000000+001 |
| * | LMTRAP | + 0 3006 | 77001 | -3 | -3.888888889-003 | -3.888888889-003 REV/SEC |
| * | LMMEGAN+ | 0 3007 | 00000 | 14 | 0.000000000+000 | 0.000000000+000 |
| * | LMKACSN | + 0 3010 | 00074 | 14 | 6.000000000+001 | 6.000000000+001 |
| * | DKDP | + 0 3011 | 00200 | 15 | 2.560000000+002 | 2.560000000+002 REV-1 |
| 2 * | IGNACSO | + 0 3012 | 02555 | -2 | 7.630000000+000 DEG/SEC2 | 2.119444446-002 REV/SEC2 |
| 1 * | IGNACSR | + 0 3013 | 00150 | -2 | 5.700000000-001 DEG/SEC2 | 1.583333335-003 REV/SEC2 |
| * | DWNTORP+ | 0 3113 | 00000 | 5 | | 0.000000000+000 JET SEC |
| * | DWNTORP+ | 1 3114 | 00000 | 5 | | 0.000000000+000 JET SEC |
| * | DWNTORP+ | 2 3115 | 00000 | 5 | | 0.000000000+000 JET SEC |
| * | DWNTORP+ | 3 3116 | 00000 | 5 | | 0.000000000+000 JET SEC |

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|------------------------|-------------------------|
| * | DWNTORK+ | 4 | 3117 00000 | 5 | | 0.000000000+000 JET SEC |
| * | DWNTORK+ | 5 | 3120 00000 | 5 | | 0.000000000+000 JET SEC |
| 1 * | VELRIAS + | 0 | 3371 00001 3372 36331 | 6 | 2.500000000+000 FT/SEC | 7.620000000-003 M/CS |
| 1 * | AZBIAS + | 0 | 3373 77201 | -1 | -4.200000000+000 DEG | -1.166666667-002 REV |
| * | ATIGINC + | 0 | 3400 00001 3401 03120 | 28 | 3.000000000+000 MIN | 1.800000000+004 CS |
| * | PTIGINC + | 0 | 3402 00001 3403 03120 | 28 | 3.000000000+000 MIN | 1.800000000+004 CS |
| * | ACTAZ + | 0 | 3404 65244 | -1 | -6.007800000+001 DEG | -1.668833335-001 REV |
| * | AOTAZ + | 1 | 3405 77770 | -1 | -7.400000000-002 DEG | -2.055555557-004 REV |
| * | AOTAZ + | 2 | 3406 12514 | -1 | 5.990100000+001 DEG | 1.663916668-001 REV |
| * | ACTAZ + | 3 | 3407 25247 | -1 | 1.199570000+002 DEG | 3.332138892-001 REV |

FINAL H2 PRELAUNCH ERASABLE LOAD >LM131A REV 1↑

| REV | MNEMONIC | ACDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|------------|----|----------------------|----------------------|
| * | AOTAZ | + 4 | 3410 37775 | -1 | 1.799640000+002 DEG | 4.990000004-001 REV |
| * | AOTAZ | + 5 | 3411 52521 | -1 | -1.200480000+002 DEG | -3.334666669-001 REV |
| * | AOTEL | + 0 | 3412 10011 | -1 | 4.509500000+001 DEG | 1.252638890-001 REV |
| * | AOTEL | + 1 | 3413 10012 | -1 | 4.511300000+001 DEG | 1.253138890-001 REV |
| * | AOTEL | + 2 | 3414 10014 | -1 | 4.512800000+001 DEG | 1.253555557-001 REV |
| * | AOTEL | + 3 | 3415 10013 | -1 | 4.512500000+001 DEG | 1.253472223-001 REV |
| * | AOTEL | + 4 | 3416 10012 | -1 | 4.510700000+001 DEG | 1.252972223-001 REV |
| * | AOTEL | + 5 | 3417 10010 | -1 | 4.509200000+001 DEG | 1.252555557-001 REV |
| * | LRHMAX | + 0 | 3420 35610 | 14 | 5.000000000+004 FT | 1.524000000+004 M |
| * | LRWH | + 0 | 3421 13146 | 0 | 3.500000000-001 | 3.500000000-001 |
| * | ZOCMTIME+ | 0 | 3422 05050 | 14 | 2.600000000+001 SEC | 2.600000000+003 CS |
| * | TENDBRAK+ | 0 | 3423 01407 | 17 | 6.200000000+001 SEC | 6.200000000+003 CS |
| * | TENDAPPR+ | 0 | 3424 00226 | 17 | 1.200000000+001 SEC | 1.200000000+003 CS |

FINAL H2 PRELAUNCH ERASABLE LOAD ≥LM131A REV 1↑

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|----------|-------|-------|----------------------|---------------------|
| * | DELTFAP+ | 0 3425 | 75632 | 17 | -9.000000000+001 SEC | -9.000000000+003 CS |
| * | LEADTIME+ | 0 3426 | 77743 | 17 | 2.200000000+000 SEC | -2.200000000+002 CS |
| * | RPCRTIME+ | 0 3427 | 01407 | 17 | 6.200000000+001 SEC | 6.200000000+003 CS |
| * | RPCRTOSW+ | 0 3430 | 57777 | 1 | -1.000000000+000 | -1.000000000+000 |
| * | TNEWA | + 0 3431 | 20000 | 28 | | 1.342177280+008 |
| | | | 3432 | 00000 | | |

A LARGE NUMBER TO PREVENT RECYCLING THE LAMBERT
SOLUTION

FINAL H2 PRELAUNCH FRASABLE LOAD >LM131A REV 1*

| A | B | C | D | E | F | G | H | I | J | K | L | TC | |
|--------|-------|-------|-------|--------|----------|-------|-------|--------|----------|-------|-------|-------|----|
| ID V71 | V71 | V71 | V71 | ID V71 | V71 | V71 | V71 | ID V71 | V71 | V71 | V71 | ID | |
| 01 | 00021 | 00021 | 00010 | 00024 | 01 00010 | 00024 | 00024 | 00024 | 01 00024 | 00020 | 00024 | 00024 | 01 |
| 02 | 01452 | 01700 | 01770 | 02000 | 02 02022 | 02400 | 02422 | 02444 | 02 02466 | 02510 | 02526 | 02550 | 02 |
| 03 | 03641 | 00000 | 01351 | 05750 | 03 00311 | 04347 | 77663 | 77777 | 03 00000 | 07640 | 01414 | 07015 | 03 |
| 04 | 64417 | 00000 | 24734 | 00763 | 04 31177 | 20441 | 77104 | 77400 | 04 00000 | 14632 | 00116 | 12075 | 04 |
| 05 | 74272 | 00000 | 02354 | 17270 | 05 77700 | 77776 | 77765 | 00000 | 05 00113 | 00017 | 11463 | 75534 | 05 |
| 06 | 54401 | 00000 | 04750 | 17270 | 06 55774 | 78044 | 45231 | 00000 | 06 04704 | 00003 | 11463 | 64200 | 06 |
| 07 | 03775 | 00000 | 00410 | 00023 | 07 77762 | 00000 | 77067 | 00000 | 07 00416 | 00000 | 11463 | 07017 | 07 |
| 10 | 72727 | 00000 | 00165 | 00001 | 10 55732 | 00000 | 72634 | 00372 | 10 15755 | 00364 | 06315 | 31511 | 10 |
| 11 | 00063 | 00011 | | 00000 | 11 | 77773 | 77545 | 00002 | 11 77730 | 00000 | 06315 | 73337 | 11 |
| 12 | 00015 | 05253 | | 00000 | 12 | 75347 | 63177 | 14522 | 12 51505 | 00226 | 06315 | 66580 | 12 |
| 13 | 77762 | 33560 | | 00103 | 13 | 77766 | 37777 | 00000 | 13 77121 | 00000 | 03146 | 76381 | 13 |
| 14 | 77627 | 30623 | | 00103 | 14 | 74245 | 37777 | 00000 | 14 73554 | 01717 | 14370 | 77023 | 14 |
| 15 | 00202 | 37367 | | 77772 | 15 | 00000 | 00567 | 77774 | 15 77255 | 01042 | 11300 | 03326 | 15 |
| 16 | 77713 | 00000 | | 46750 | 16 | 00000 | 25762 | 71233 | 16 41625 | 04211 | 00000 | 13475 | 16 |
| 17 | 77745 | 23066 | | 77773 | 17 | 77773 | 00000 | 00000 | 17 73754 | 01042 | 15164 | 00016 | 17 |
| 20 | 00266 | 00000 | | 57473 | 20 | 45722 | 00624 | 01062 | 20 52751 | 00000 | 01420 | 32446 | 20 |
| 21 | 00000 | 26474 | | 00006 | 21 | 77774 | 00000 | 77754 | 21 72516 | | 00001 | 00007 | 21 |
| 22 | | | | 06361 | 22 | 54701 | 00000 | 67646 | 22 57777 | | 27631 | 23346 | 22 |
| 23 | | | | 04225 | 23 | 00000 | 77777 | 00612 | 23 04114 | | 00013 | 00000 | 23 |
| 24 | | | | 10400 | 24 | 00000 | 77635 | 30722 | 24 04454 | | 06551 | 00000 | 24 |

RO3 parameters

To reflect mass property changes

TEPHEM

To reflect time of lift-off

WRENDPOS

609.6m 01142

WRENDVEL

0.006096m/cs 00144

WSHAFT

0.005rad 05075

WTRUN

0.005rad 05075

RLS

To reflect improvement in knowledge
of landing site