

UNITED STATES GOVERNMENT

Memorandum

12 LOAD
LUM 116

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

FROM : FS/Chief, Flight Support Division

DATE: OCT 31 1969

In reply refer to:
69-FS55-69

SUBJECT: Final Apollo 12 (Mission H₁) prelaunch erasable load (LUMINARY 116)

1. Enclosure 1 consists of the final values for the parameters in the Apollo 12 (Mission H₁) 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 12 erasable load. A solid stripe to the right of the parameter indicates a change from the last published memorandum.
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. All values for parameters in the inflight erasable load should be consistent with the prelaunch values unless there is a change to that parameter.
4. Enclosure 2 consists of planned changes to the Apollo 12 erasable load, with values when known.
5. Enclosure 3 consists of data dependent upon day of launch for launch on November 16, 1969.
6. Questions or comments regarding erasable loads should be directed to Mr. J. W. Jurgensen, extension 2111.


Lynwood C. Dunseith

Enclosures 3

FS55:JWJurgensen:sjm



H PRELAUNCH ERASABLE LOAD (LUMINARY 116)

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------|----|---------------------|--------------------------|
| 1 | FLAGWRD3+ | 0 | 0077 12000 | -0 | | |
| | FLAGWRD8+ | 0 | 0104 00000 | -0 | | |
| | FLGWRD10+ | 0 | 0106 00000 | -0 | | |
| 1 | MASS | + | 0 1243 07407 | 16 | 3.392880000+004 LBS | 1.538984480+004 KGS |
| | MASS | + | 1 1244 00000 | 0 | 0.000000000+000 LBS | 0.000000000+000 KGS |
| 1** | LEMASS | + | 0 1326 07407 | 16 | 3.392880000+004 LBS | 1.538984480+004 KGS |
| 1** | CSMASS | + | 0 1327 10176 | 16 | 3.723220000+004 LBS | 1.688824184+004 KGS |
| | * E3J22R2M+ | 0 | 1347 12160 | 58 | | 9.204790479+016 M5/CS2 |
| | * E32C31RM+ | 0 | 1350 03363 | 80 | | 1.312892560+023 M6/CS2 |
| | * RADSKAL | + | 0 1351 00000 | 21 | | 0.000000000+000 LRB/M/CS |
| | | | 1352 00000 | | | |

UNITS ARE LR LOW SCALE ALTITUDE BITS/METER/CS

H PRELAUNCH ERASABLE LOAD (LUMINARY 116)

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------|----|-------------------|--------------------|
| | * SKALSKAL+ | 0 | 1353 00000 | 0 | | 0.000000000+000 |
| 1 | * PBIASX | + | 0 1452 77015 | -3 | -3.799438477-005 | -3.799438477-003 |
| 1 | * PIPASCFX+ | 0 | 1453 65137 | -9 | | -6.599426270-004 |
| 1 | * PBIASY | + | 0 1454 00032 | -3 | 1.983642578-006 | 1.983642578-004 |
| 1 | * PIPASCFY+ | 0 | 1455 64147 | -9 | | -7.200241089-004 |
| 1 | * PBIASZ | + | 0 1456 01455 | -3 | 6.202697754-005 | 6.202697754-003 |
| 1 | * PIPASCFZ+ | 0 | 1457 61325 | -9 | | -8.900165558-004 |
| 1 | * NBDX | + | 0 1460 00015 | -5 | | 2.479553223-005 |
| 1 | * NBDY | + | 0 1461 00146 | -5 | | 1.945495605-004 |
| 1 | * NBDZ | + | 0 1462 00576 | -5 | | 7.286071777-004 |
| 1 | * ADIAX | + | 0 1463 00672 | -5 | | 8.430480957-004 |
| 1 | * ADIAY | + | 0 1464 77171 | -5 | | -7.438659668-004 |
| 1 | * ADIAZ | + | 0 1465 00522 | -5 | | 6.446838379-004 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--|----|-------------------|-------------------------|
| 1 * | ADSRAX | + 0 | 1466 77713 | -5 | | -9.918212890-005 |
| 1 * | ADSRAY | + 0 | 1467 00150 | -5 | | 1.983642578-004 |
| 1 * | ADSRAZ | + 0 | 1470 77713 | -5 | | -9.918212890-005 |
| * | GCOMP SW | + 0 | 1477 00000 | -0 | | |
| | TETCSM | + 0 | 1570 37777 | -0 | | |
| | TETLEM | + 0 | 1642 37777 | -0 | | |
| * | X789 | + 0 | 1700 00000 1701 00000 | 5 | | 0.000000000+000 RADIANS |
| * | X789 | + 2 | 1702 00000 1703 00000 | 5 | | 0.000000000+000 RADIANS |
| * | X789 | + 4 | 1704 00000 1705 00000 | 5 | | 0.000000000+000 RADIANS |
| * | TEPHM | + 0 | 1706 00004 1707 14616 1710 13640 | 42 | 1.180932000+007 | 1.180932000+009 CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|----------------------|----------------------|
| 1 | * AZO | + 0 | 1711 30623 1712 37457 | 0 | 2.788766728+002 DEG | 7.746574251-001 REV |
| | * -AYO | + 0 | 1713 77777 1714 73551 | 0 | -2.947747705-003 DEG | -8.188188076-006 REV |
| | * AXO | + 0 | 1715 00000 1716 26073 | 0 | 1.518532633-002 DEG | 4.218146205-005 REV |
| 1 | REFSMMAT+ | 0 | 1733 61727 1734 40512 | 1 | | -8.800024200-001 |
| 1 | REFSMMAT+ | 2 | 1735 75331 1736 57404 | 1 | | -1.609515800-001 |
| 1 | REFSMMAT+ | 4 | 1737 07114 1740 27444 | 1 | | 4.468672600-001 |
| 1 | REFSMMAT+ | 6 | 1741 07225 1742 32063 | 1 | | 4.557880400-001 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|---------------|------|-------|-----|-------------------|--------------------|
| 1 | REFSMMAT+ 8 | 1743 | 67137 | 1 | | -5.508307400-001 |
| | | 1744 | 63015 | | | |
| 1 | REFSMMAT+10 | 1745 | 13137 | 1 | | 6.991729200-001 |
| | | 1746 | 23771 | | | |
| 1 | REFSMMAT+12 | 1747 | 02106 | 1 | | 1.336152400-001 |
| | | 1750 | 22336 | | | |
| 1 | REFSMMAT+14 | 1751 | 15064 | 1 | | 8.189506200-001 |
| | | 1752 | 32774 | | | |
| 1 | REFSMMAT+16 | 1753 | 10733 | 1 | | 5.580921800-001 |
| | | 1754 | 34410 | | | |
| | * RANGEVAR+ 0 | 1770 | 01351 | -12 | | 1.111111111-005 |
| | | 1771 | 24734 | | | |
| | * RATEVAR + 0 | 1772 | 02354 | -12 | | 1.877777000-005 |
| | | 1773 | 04750 | | | |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|--------------------------|--------------------------|
| | * 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 |
| | * WRENDPOS+ | 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 |
| 1 | * WSURFPOS+ | 0 | 2006 00000 | 14 | 0.000000000+000 FT | 0.000000000+000 M |
| 1 | * WSURFVEL+ | 0 | 2007 00000 | 0 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| | * SHAFTVAR+ | 0 | 2010 00103 | -12 | 1.000000000+000 MILLIRAD | 1.000000000-006 RADIANS2 |
| | * TRUNVAR + | 0 | 2011 00103 | -12 | 1.000000000+000 MILLIRAD | 1.000000000-006 RADIANS2 |
| 1 | * S04LM + | 0 | 2012 77775 2013 43470 | 0 | -0.000000000+000 | -1.762174070-004 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--------------------------|----|--------------------|--------------------|
| 1 * | 504LM | + 2 | 2014 77767 2015 67426 | 0 | -0.000000000+000 | -5.044080317-004 |
| 1 * | 504LM | + 4 | 2016 77771 2017 55522 | 0 | -0.000000000+000 | -4.011876881-004 |
| 1 * | AGSK | + 0 | 2020 04225 2021 10400 | 28 | 1.000000000+002 HR | 3.600000000+007 CS |
| 2 * | RLS | + 0 | 2022 00302 2023 06357 | 27 | | 1.590903491+006 M |
| 2 * | RLS | + 2 | 2024 77653 2025 77630 | 27 | | -6.881794989+005 M |
| 2 * | RLS | + 4 | 2026 77764 2027 77202 | 27 | | -9.030249953+004 M |
| 1 * | TLAND | + 0 | 2400 04575 2401 26646 | 28 | 1.105789500+002 HR | 3.980842200+007 CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|----------|------|--------------------------|----|--------------------------|------------------------|
| 1 | * RBRFG | + 0 | 2402 77776 2403 76044 | 24 | -3.562050000+003 FT | -1.085712840+003 M |
| | * RBRFG | + 2 | 2404 00000 2405 00000 | 24 | 0.000000000+000 FT | 0.000000000+000 M |
| 1 | * RBRFG | + 4 | 2406 77773 2407 75347 | 24 | -1.370571000+004 FT | -4.177500408+003 M |
| 1 | * VBRFG | + 0 | 2410 77766 2411 74245 | 10 | -1.869030500+002 FT/SEC | -5.696804964-001 M/CS |
| | * VBRFG | + 2 | 2412 00000 2413 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| 1 | * VBRFG | + 4 | 2414 77773 2415 45722 | 10 | -9.873819000+001 FT/SEC | -3.009540031-001 M/CS |
| 1 | * ABRFG | + 0 | 2416 77774 2417 54701 | -4 | -4.502495000-001 FT/SEC2 | -1.372360476-005 M/CS2 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|--------------------------|------------------------|
| | * ABRFG | + 2 | 2420 00000 2421 00000 | -4 | 0.000000000+000 FT/SEC2 | 0.000000000+000 M/CS2 |
| 1 | * ABRFG | + 4 | 2422 77663 2423 77104 | -4 | -9.515097500+000 FT/SEC2 | -2.900201718-004 M/CS2 |
| 1 | * VBRFG* | + 0 | 2424 77765 2425 45231 | 13 | -1.777287420+003 FT | -5.417172056+000 |
| 1 | * ABRFG* | + 0 | 2426 77067 2427 72634 | -4 | -5.709058500+001 FT/SEC2 | -1.740121031-003 M/CS2 |
| 1 | * JBRFG* | + 0 | 2430 77545 2431 63205 | -21 | -1.474270000-002 FT/SEC3 | -4.493574960-009 M/CS3 |
| | * GAINBRAK+ | 0 | 2432 37777 2433 37777 | 0 | | 1.000000000+000 |
| | * TCGFBRAK+ | 0 | 2434 00567 | 17 | 3.000000000+001 SEC | 3.000000000+003 CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|------------|------|--------------------------|----|-------------------------|-----------------------|
| | * TCGIBRAK | + 0 | 2435 25762 | 17 | 9.000000000+002 SEC | 9.000000000+004 CS |
| 1 | * 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 |
| 1 | * RAPFG | + 4 | 2442 77777 2443 77635 | 24 | -2.016050000+001 FT | -6.144920400+000 M |
| 1 | * VAPFG | + 0 | 2444 77777 2445 77400 | 10 | -3.190000000-001 FT/SEC | -9.723120000-004 M/CS |
| | * VAPFG | + 2 | 2446 00000 2447 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| 1 | * VAPFG | + 4 | 2450 00000 2451 00372 | 10 | 3.123300000-001 FT/SEC | 9.519818400-004 M/CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|--------------------------|------------------------|
| 1 * | AAPFG | + 0 | 2452 00002 2453 14522 | -4 | 2.998200000-001 FT/SEC2 | 9.138513600-006 M/CS2 |
| | * AAPFG | + 2 | 2454 00000 2455 00000 | -4 | 0.000000000+000 FT/SEC2 | 0.000000000+000 M/CS2 |
| 1 * | AAPFG | + 4 | 2456 77774 2457 71233 | -4 | -4.016500000-001 FT/SEC2 | -1.224229200-005 M/CS2 |
| 1 * | VAPFG* | + 0 | 2460 00000 2461 01062 | 13 | 5.621940000+000 FT/SEC | 1.713567312-002 M/CS2 |
| 1 * | AAPFG* | + 0 | 2462 77754 2463 67646 | -4 | -2.409900000+000 FT/SEC2 | -7.345375200-005 M/CS2 |
| 1 * | JAPFG* | + 0 | 2464 00612 2465 30716 | -21 | 3.769540000-002 FT/SEC3 | 1.148955792-008 M/CS3 |
| | * GAINAPPR+ | 0 | 2466 00000 2467 00000 | 0 | | 0.000000000+000 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|-----|-------------------------|-----------------------|
| 1 * | 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 |
| 1 * | VIGN | + 0 | 2472 00416 2473 26754 | 10 | 5.551129900+003 FT/SEC | 1.691984393+001 FT/CS |
| 1 * | RIGNX | + 0 | 2474 77737 2475 54417 | 24 | -1.330675200+005 FT | -4.055898010+004 M |
| 1 * | RIGNZ | + 0 | 2476 77124 2477 40076 | 24 | -1.437887400+006 FT | -4.382680795+005 M |
| 1 * | KIGNX/B4+ | 0 | 2500 77255 2501 41625 | 4 | | -3.310000000-001 |
| 1 * | KIGNY/B8+ | 0 | 2502 73754 2503 52751 | -16 | -5.869400000-007 FT/FT2 | -1.925656168-006 M-1 |
| 1 * | KIGNV/B4+ | 0 | 2504 72516 2505 57777 | 18 | -4.380000000+002 SEC | -4.380000000+004 CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|--------------|------|--------------------------|----|-------------------------|--------------------------|
| | * LOWCRIT + | 0 | 2506 04114 | 14 | 5.985000000+003 LBF | 2.124374401+003 DPSTR0TP |
| | * HIGHCRIT + | 0 | 2507 04454 | 14 | 6.615000000+003 LBF | 2.347992759+003 DPSTR0TP |
| | * V2FG + | 0 | 2510 77777 2511 73242 | 10 | -3.000000000+000 FT/SEC | -9.144000000-003 M/CS |
| | * V2FG + | 2 | 2512 00000 2513 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| | * V2FG + | 4 | 2514 00000 2515 00000 | 10 | 0.000000000+000 FT/SEC | 0.000000000+000 M/CS |
| 1 | * TAUVERT + | 0 | 2516 01440 2517 00000 | 14 | 8.000000000+000 SEC | 8.000000000+002 CS |
| | * DELQFIX + | 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 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|-------|----|------------------------|----------------------|
| * | 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 |
| * | LRWVY + 0 | 2531 | 11463 | 0 | | 3.000000000-001 |
| * | LRWVX + 0 | 2532 | 11463 | 0 | | 3.000000000-001 |
| * | LRWVFZ + 0 | 2533 | 06315 | 0 | | 2.000000000-001 |
| * | LRWVFY + 0 | 2534 | 06315 | 0 | | 2.000000000-001 |
| * | LRWVFX + 0 | 2535 | 06315 | 0 | | 2.000000000-001 |
| * | LRWVFF + 0 | 2536 | 03146 | 0 | | 1.000000000-001 |
| * | RODSCALE+ 0 | 2537 | 14370 | -7 | 1.000000000+000 FT/SEC | 3.048000000-003 M/CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|----|-------------------------|--------------------------|
| | * TAUR0D | + 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 |
| | * 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 |
| I | * J1PARM | + 0 | 2550 07007 2551 10322 | 23 | 6.032567500+006 FT | 1.838726574+006 M |
| 1 | * K1PARM | + 0 | 2552 73325 2553 70124 | 23 | -6.272612500+005 FT/RAD | -1.201277354+006 M/REV |
| I | * J2PARM | + 0 | 2554 07006 2555 00350 | 23 | 6.030470000+006 FT | 1.838087256+006 M |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|-------------------------|------------------------|
| 1 * | K2PARM + | 0 | 2556 75531 2557 47013 | 23 | -3.183514600+005 FT/RAD | -6.096796184+005 M/REV |
| 1 * | THETCRIT+ | 0 | 2560 00575 2561 23247 | 0 | 8.384852304+000 DEG | 2.329125642-002 REV |
| 1 * | RAMIN + | 0 | 2562 03325 2563 11360 | 24 | 5.876899700+006 FT | 1.791279028+006 M |
| 1 * | YLIM + | 0 | 2564 00016 2565 32446 | 24 | 8.200000000+000 N.MI. | 1.518640000+004 M |
| * | ABTRDOT + | 0 | 2566 00007 2567 23346 | 7 | 1.950000000+001 FT/SEC | 5.943600000-002 M |
| * | COSTHET1+ | 0 | 2570 00000 2571 00000 | -8 | | 0.000000000+000 |
| * | COSTHET2+ | 0 | 2572 06733 2573 07535 | 2 | | 8.660254037-001 |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|---------------------|--------------------------|
| * | 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 LBS | 4.944156833+003 KG |
| 1** | ROLLTIME+ | 0 | 3001 05477 | 14 | 2.879000000+001 SEC | 2.879000000+003 CS |
| 1** | PITTIME | + 0 | 3002 04727 | 14 | 2.519000000+001 SEC | 2.519000000+003 CS |
| * | DKTRAP | + 0 | 3003 77001 | -3 | | -3.888888889-003 REV/SEC |
| * | DKOMEGAN+ | 0 | 3004 00012 | 14 | | 1.000000000+001 |
| * | DKKAOSN | + 0 | 3005 00074 | 14 | | 6.000000000+001 |
| * | LMTRAP | + 0 | 3006 77001 | -3 | | -3.888888889-003 REV/SEC |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|----|--------------------------|--------------------------|
| | * LMOMEGAN+ | 0 | 3007 00000 | 14 | | 0.000000000+000 |
| | * LMKAOSN + | 0 | 3010 00074 | 14 | | 6.000000000+001 |
| | * DKDB | + 0 | 3011 00200 | 15 | | 2.560000000+002 REV-1 |
| 1 | * IGNAOSQ + | 0 | 3012 02653 | -2 | 7.970000000+000 DEG/SEC2 | 2.213888891-002 REV/SEC2 |
| 1 | * IGNAOSR + | 0 | 3013 00144 | -2 | 5.600000000-001 DEG/SEC2 | 1.555555557-003 REV/SEC2 |
| | * DOWNTORK+ | 0 | 3113 00000 | 5 | | 0.000000000+000 JET SEC |
| | * DOWNTORK+ | 1 | 3114 00000 | 5 | | 0.000000000+000 JET SEC |
| | * DOWNTORK+ | 2 | 3115 00000 | 5 | | 0.000000000+000 JET SEC |
| | * DOWNTORK+ | 3 | 3116 00000 | 5 | | 0.000000000+000 JET SEC |
| | * DOWNTORK+ | 4 | 3117 00000 | 5 | | 0.000000000+000 JET SEC |
| | * DOWNTORK+ | 5 | 3120 00000 | 5 | | 0.000000000+000 JET SEC |
| | * ATIGINC + | 0 | 3400 00001 3401 03120 | 28 | 3.000000000+000 MIN | 1.800000000+004 CS |

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| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-----------|------|--------------------------|----|---------------------|----------------------|
| | * PTIGINC | + 0 | 3402 00001 3403 03120 | 28 | 3.00000000+000 MIN | 1.80000000+004 CS |
| 1 | * AOTAZ | + 0 | 3404 65313 | -1 | -5.96440000+001 DEG | -1.656777779-001 REV |
| | * AOTAZ | + 1 | 3405 00035 | -1 | 3.15000000-001 DEG | 8.750000007-004 REV |
| | * AOTAZ | + 2 | 3406 12557 | -1 | 6.02800000+001 DEG | 1.674444446-001 REV |
| | * AOTAZ | + 3 | 3407 25313 | -1 | 1.20355000+002 DEG | 3.343194447-001 REV |
| 1 | * AOTAZ | + 4 | 3410 40037 | -1 | -1.79661000+002 DEG | -4.990583337-001 REV |
| 1 | * AOTAZ | + 5 | 3411 52562 | -1 | -1.19688000+002 DEG | -3.324666669-001 REV |
| | * AOTEL | + 0 | 3412 10007 | -1 | 4.50780000+001 DEG | 1.252166668-001 REV |
| | * AOTEL | + 1 | 3413 10011 | -1 | 4.51010000+001 DEG | 1.252805557-001 REV |
| | * AOTEL | + 2 | 3414 10011 | -1 | 4.50990000+001 DEG | 1.252750001-001 REV |
| | * AOTEL | + 3 | 3415 10007 | -1 | 4.50740000+001 DEG | 1.252055557-001 REV |
| | * AOTEL | + 4 | 3416 10005 | -1 | 4.50520000+001 DEG | 1.251444445-001 REV |

H PRELAUNCH ERASABLE LOAD (LUMINARY 116)

| REV | MNEMONIC | ADDR | OCTAL | SF | ENGINEERING VALUE | VALUE IN AGC UNITS |
|-----|-------------|------|--------------------------|----|----------------------|---------------------|
| | * ACTEL | + 5 | 3417 10005 | -1 | 4.505300000+001 DEG | 1.251472223-001 REV |
| | * LRHMAX | + 0 | 3420 35610 | 14 | 5.000000000+004 FT | 1.524000000+004 M |
| | * LRWH | + 0 | 3421 13146 | 0 | | 3.500000000-001 |
| | * ZOOMTIME+ | 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 |
| 1 | * DELTTFAP+ | 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 |
| | * RPCRTQSW+ | 0 | 3430 57777 | 1 | | -1.000000000+000 |
| | * TNEWA | + 0 | 3431 20000 3432 00000 | 28 | | 1.342177280+008 |

A LARGE NUMBER TO PREVENT RECYCLING THE LAMBERT
SOLUTION

W MATRIX DIAGONAL FOR REINITIALIZATIONS

LUMINARY

| | W_{rr} (Meters) | W_{rv} (M/CS) | W_{β} (Rad) | W_{θ} (Rad) |
|---------|-------------------|-----------------|-------------------|--------------------|
| DECIMAL | 609.6 | .006096 | .005 | .005 |
| OCTAL | 01142 | 00144 | 05075 | 05075 |

COMANCHE 55

| | W_{rr} (Meters) | W_{rv} |
|---------|-------------------|----------|
| DECIMAL | 609.6 | .006096 |
| OCTAL | 00023 | 00144 |

LGC and CMC TEPHEM updated to reflect time of lift-off

LMC HORIZALT

Launch November 14

| | LAT(DEC) | R(LS) | SITE | 007 | LONG(DEC) | ALT(N MI.) |
|---------|-----------------|-------|------|-----|------------------|------------------|
| | -2.98222199E 00 | | | | -2.339194417E 01 | -1.280237570E 00 |
| | X | | | | Y | Z |
| DECIMAL | 1.590903491E 06 | | | | -6.881794989E 05 | -9.030249953E 04 |
| OCTAL | 302 6357 | | | | -77653 77630 | 77764 77202 |

Launch November 16

| | LAT(DEC) | R(LS) | SITE | 005 | LONG(DEC) | ALT(N MI.) |
|---------|-----------------|-------|------|-----|------------------|------------------|
| | 1.678055555E 00 | | | | -4.189816411E 01 | -1.249460042E 00 |
| | X | | | | Y | Z |
| DECIMAL | 1.221420490E 06 | | | | -1.153691495E 06 | 5.082899388E 04 |
| OCTAL | 235 24471 | | | | 77552 81670 | 5 6432 |

TEPHEM 1183680000 cs 00004,15066,03000

for clock align on GMT of November 15, 1969