# OEMV QUICK REFERENCE GUIDE

Precise thinking

## NovAtel Format Commands

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| ADJUST1PPS | adjust1pps mode [period] [offset]<br>`adjust1pps mark` | 429 | V123 | Adjust receiver clock or transfer time between receivers |
| ANTENNA-MODEL | antennamodel name SN setupID type [L1 offset] [L1 var] [L2 offset] [L2 var]<br>`antennamodel 702gg nae07070025 3 user` | 841 | V123 | Enter or change a rover antenna model, see also the command: BASEANTENNAMODEL |
| ANTENNA-POWER | antennapower flag<br>`antennapower on` | 98 | V23 | Enable/disable power from receiver's internal power source to the low-noise amplifier of an active antenna |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| ASSIGN | assign channel [state] prn [Doppler [window]]<br>`assign 11,28,-250,0`<br>*(sv channel 11 is acquiring satellite prn 28 at an offset of 250 hz only)*<br>*(prn 1 to 32 for gps channels, 38 to 61 for glonass, and 120 to 138 for sbas)* | 27 | V123 | Aids in initial acquisition of a satellite by allowing you to override the automatic satellite/channel assignment reacquisition processes |
| ASSIGNALL | assignall [system] [state] prn [Doppler [window]]<br>`assignall gpsl1l2,28,-250,0`<br>*(l1 and l2 dedicated sv channels trying to acquire satellite prn 28 at -250 hz)* | 28 | V123 | This command works the same way as ASSIGN except that it affects all SV channels |
| ASSIGN-LBAND | assignlband mode freq baud<br>`assignlband cdgps 1547547 4800` *or*<br>`assignlband omnistar 1536782 1200` | 729 | V3_HP<br>V13_VBS<br>V13_CDGPS | The receiver searches for a specified L-Band satellite at a specified frequency with a specified baud rate |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| AUTH | auth [state] part1 part2 part3 part4 part5 model [date]<br>`auth add 1234 5678 9abc def0 1234 oemv1l2 990131` | 49 | V123 | Add or remove authorization codes from the receiver |
| BASE-ANTENNA-MODEL | antennamodel name SN setupID type [L1 offset] [L1 var] [L2 offset] [L2 var]<br>`antennamodel nvh05410007 1 user` | 870 | V123 | Enter or change a base antenna model.<br>For the rover, see the ANTENNAMODEL command |
| CDGPS-TIMEOUT | cdgps mode [delay]<br>`cdgpstimeout set 60`<br>*(the auto default is 120 s)* | 850 | V13_CDGPS | Set amount of time receiver remains in CDGPS position if it stops receiving CDGPS |
| CLOCK-ADJUST | clockadjust switch<br>`clockadjust disable` | 15 | V123 | Enable/disable receiver clock steering |
| CLOCK-CALIBRATE | clockcalibrate mode [period] [width] [slope] [bandwidth]<br>`clockcalibrate auto` | 430 | V123 | Adjust the control parameters of the clock steering loop |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| CLOCK-OFFSET | clockoffset offset<br>`clockoffset -15` | 596 | V123 | Remove a delay in the PPS output |
| CNOUPDATE | cnoupdate rate<br>`cnoupdate 20hz` | 849 | V123 | C/No update rate and resolution |
| COM | com [port] bps [parity [databits [stopbits [handshake [echo[break]]]]]]<br>`com com1 57600 n 8 1 n off on` | 4 | V123 | Configure the receiver asynchronous serial port drivers |
| COM-CONTROL | comcontrol port signal control<br>`comcontrol com2 rts default` | 431 | V123 | Control the hardware control lines of the RS232 ports |
| CSMOOTH | csmooth L1time [L2time]<br>`csmooth 500` | 269 | V123 | Set carrier smoothing on code measurements |
| DATUM | datum datum<br>`datum csrs` | 160 | V123 | Select a datum |
| DGPSEPHEM-DELAY | dgpsephemdelay delay<br>`dgpsephemdelay 120` | 142 | V123_DGPS | Set base station ephemeris delay |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| DGPSTIME-OUT | dgpstimeout delay<br>`dgpstimeout 60` | 127 | V123_DGPS | Set rover station max. age of pseudorange differential data |
| DGPSTXID | dgpstxid type ID<br>`dgpstxid rtcm 2`<br>`dgpstxid rtca d36`<br>`dgpstxid rtcmv3 2050`<br>`dgpstxid cmr 30` | 144 | V123_DGPS | Set station ID value for the receiver when it is transmitting corrections |
| DIFFCODE-BIAS-CONTROL | diffcodebiascontrol switch<br>`diffcodebiascontrol disable`<br>*(enable by default)* | 913 | V123 | Enable/disable the differential code biases applied to the L1/L2 ionospheric corrections |
| DYNAMICS | dynamics dynamics<br>`dynamics foot` | 258 | V123 | Adjust receiver to match environment |
| ECUTOFF | ecutoff angle<br>`ecutoff 10.0` | 50 | V123 | Set elevation cut-off angle for satellites |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| EXTERNAL-CLOCK | externalclock clocktype [freq] [h0[h -1[h -2]]]<br>`externalclock tcxo 5mhz` | 230 | V23 | Allow OEMV to operate with an optional external oscillator |
| FIX | fix type [param1 [param2 [param3]]]<br>`fix height 4.567` | 44 | V123 | Fix parameters such as height or position |
| FIXPOS-DATUM | fixposdatum datum [lat [lon [height]]]<br>`fixposdatum user 51.11633810554 -114.03839550586 1048.2343` | 761 | V123 | Set position by referencing parameters through a specified datum |
| FORCE-GPSL2CODE | forcegpsl2code L2type<br>`forcegpsl2code p` | 796 | V23_L2C | Force receiver to track L2 P or L2C code |
| FREQUENCY-OUT | frequencyout [switch] [pulsewidth] [period]<br>`frequencyout enable 2 4`<br>*(to generate a 50% duty cycle 10 mhz square wave)* | 232 | V123 | Set output pulse train available on the VARF pin (variable frequency) |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| FRESET | freset [target]<br>`freset command` | 20 | V123 | Clear data which is stored in non-volatile memory |
| GGA-QUALITY | ggaquality [#entries] [pos type1] [qual1] [pos type2] [qual2]...<br>`ggaquality 2 waas 2 narrow_float 3` | 691 | V123_NMEA | Customize NMEA GPGGA GPS quality indicator |
| GLO-CSMOOTH | glocsmooth L1time [L2time]<br>`glocsmooth 200` | 830 | V1G23_G | Carrier smoothing for GLONASS channels |
| GLO-ECUTOFF | gloecutoff angle<br>`gloecutoff 15.0` | 735 | V1G23_G | Set elevation cut-off angle for tracked GLONASS satellites |
| HPSEED | hpseed reset lat lon hgt latσ lonσ hgtσ datum undulation<br>`hpseed restore` | 782 | V3_HP | Specify initial position for OmniSTAR HP/XP |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| HPSTATIC-INIT | hpstaticinit switch<br>`hpstaticinit enable`<br>*(if hp/xp detects that the receiver is stationary, it can converge more quickly)* | 780 | V3_HP | Static initialization of OmniSTAR HP/XP |
| INTERFACE-MODE | interfacemode [port] rxtype txtype [responses]<br>`interfacemode com1 rtca novatel on` | 3 | V123 | Specify what type of data a particular port on the receiver can transmit and receive |
| LOCKOUT | lockout prn<br>`lockout 8`<br>*(prn 1 to 32 for gps channels, 38 to 61 for glonass, and 120 to 138 for sbas)* | 137 | V123 | Prevent receiver from using a satellite by de-weighting its range in the solution |
| LOG | log [port] message [trigger [period[offset [hold]]]]<br>`log com1 bestposa ontime 7 2.5 hold` | 1 | V123 | Log data using several different methods of triggering the log events |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| MAGVAR | magvar type [correction [stddev]]<br>`magvar correction 15 0` | 180 | V123 | Navigate in agreement with magnetic compass bearings |
| MARK-CONTROL | markcontrol signal switch [polarity] [timebias [timeguard]]<br>`markcontrol mark1 enable negative 50 100` | 614 | V123 | Control processing of mark 1 (MK1I) and mark 2 (MK2I) inputs |
| MODEL | model model<br>`model rt2w` | 22 | V123 | Switch receiver models previously added with the AUTH command |
| MOVING-BASE-STATION | movingbasestation switch<br>`movingbasestation enable` | 763 | V123_RT20 V23_RT2 | Enable a receiver from transmitting corrections without a fixed position |
| NMEA-TALKER | nmeatalker ID<br>`nmeatalker gp` | 861 | V123 | Set NMEA talker ID: gp (GPS only) or auto (GPS, GLO or inertial) [a] |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| NVM-RESTORE | nvmrestore<br>`nvmrestore` | 197 | V123 | Restore non-volatile memory (NVM) |
| POSAVE | posave [state] maxt [maxhstd [maxvstd]]<br>`posave 24 1 2` | 173 | V123_DGPS | Implement base station position averaging |
| POS-TIMEOUT | postimeout sec<br>`postimeout 1200` | 612 | V123 | Set the time out value for the position calculation(s) |
| PPS-CONTROL | ppscontrol switch [polarity] [rate]<br>`ppscontrol enable positive 0.5` | 613 | V123 | Control OEMV polarity and rate of PPS output |
| PSRDIFF-SOURCE | psrdiffsource type ID<br>`rtksource rtcm any`<br>`psrdiffsource rtcm any`<br>`sbascontrol enable auto`<br>*(to enable rtk and psrdiff from rtcm, with an sbas fall-back)* | 493 | V123_DGPS | Identify from which base station to accept differential corrections |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| RESET | reset [delay]<br>`reset 120` | 18 | V123 | Perform a hardware reset |
| RTK-ANTENNA | rtkantenna posref [pcv]<br>`rtkantenna arp enable` | 858 | V123_RT20<br>V23_RT2 | Use L1PC or ARP and enable/disable phase centre (PC) modelling |
| RTK-COMMAND | rtkcommand action<br>`rtkcommand use_defaults` | 97 | V123_RT20<br>V23_RT2 | Reset RTK filter and clear any set RTK parameters |
| RTK-DYNAMICS | rtkdynamics mode<br>`rtkdynamics dynamic` | 183 | V123_RT20<br>V23_RT2 | Specify how receiver looks at the data: static, auto, or dynamic |
| RTKQUALITY-LEVEL | rtkqualitylevel mode<br>`rtkqualitylevel extra_safe` | 844 | V23_RT2 | Choose a quality mode |
| RTK-SOURCE | rtksource type ID<br>`rtksource rtcm any` | 494 | V123_RT20<br>V23_RT2<br>V3_HP | Identify from which base station to accept RTK corrections |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| RTKSV-ENTRIES | rtksventries number<br>`rtksventries 7`<br>*(this command only works with rtcaobs and rtcaobs2)* | 92 | V123_RT20<br>V23_RT2<br>V3_HP | Set # of satellites to be transmitted in the RTK corrections from a base station receiver |
| RTKTIMEOUT | rtktimeout delay<br>`rtktimeout 20` | 910 | V123_RT20<br>V23_RT2<br>V3_HP | Set the maximum age of RTK data accepted |
| SAVECONFIG | saveconfig<br>*(in cdu, ensure you have all windows, other than the console window, closed before using this command)* | 19 | V123 | Save present configuration in NVM |
| SBAS-CONTROL | sbascontrol keyword [system] [prn] [testmode]<br>`sbascontrol enable waas 0 zerototwo` | 652 | V123_SBAS | Set handling of SBAS corrections |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| SEND | send port data<br>`send com1 “log com1 rtcaobs ontime 5”` | 177 | V123 | Send ASCII printable data from a COM\USB port to a specified port |
| SENDHEX | sendhex port length data<br>`sendhex com1 6 143ab5910d0a` | 178 | V123 | Send non-printable characters expressed as hexadecimal pairs |
| SETAPPROX-POS | setapproxpos lat lon height<br>`setapproxpos 51.116 -114.038 0` | 377 | V123 | Set an approximate latitude, longitude, and height in the receiver |
| SETAPPROX-TIME | setapproxtime week sec | 102 | V123 | Set an approximate time in the receiver |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| SETDIFF-CODEBIASES | setdiffcodebiases [bias_type] [array of 40 biases (ns)]<br>`setdiffcodebiases gps_c1p1 -0.472 -0.006 -0.482 1.154 -1.153 0.250 -1.319 -0.535 0.119 -1.945 0.522 1.425 1.489 0.090 0.0 -0.727 1.361 -0.416 -2.066 -1.347 -0.380 0.543 0.414 -0.172 0.394 0.923 -0.422 -0.326 0.481 1.937 1.753 -1.088 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0` | 687 | V123 | Set the differential code biases being applied to the L1/L2 ionospheric corrections<br><br>See also the DIFF-CODEBIASCONTROL command |
| SETIONO-TYPE | setionotype model<br>`setionotype broadcast` | 711 | V123 | Set the ioniospheric model for the receiver |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| SETNAV | setnav from-lat from-lon to-lat to-lon track offset from-point to-point<br>`setnav 51.1516 -114.16263 51.16263 -114.1516 -125.23 start finish` | 162 | V123 | Enter a set of navigation waypoints |
| SETRTCM16 | setrtcm16 text<br>`setrtcm16 “base station will shut down in 1 hour”` | 131 | V123_DGPS | Transfer ACCII text from a base to a rover |
| SETRTCM36 | setrtcm36 extdtext<br>`setrtcm36 “quick \d166\d146\d174\d144\d140”` | 880 | V1G23_G | Enter ASCII text that includes Cyrillic or Russian characters. Eg.: “Quick ШТОРМ“ |
| STATUS-CONFIG | statusconfig type word mask<br>`statusconfig set status 0028a51d` | 95 | V123 | Configure status mask fields in the RXSTATUSEVENT log |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| UNASSIGN | unassign channel<br>`unassign 11` | 29 | V123 | Cancel a previously issued ASSIGN command |
| UNASSIGN-ALL | unassignall [system]<br>`unassignall gpsl1` | 30 | V123 | Cancel previous ASSIGN commands for all SV channels |
| UNDULATION | undulation option [separation]<br>`undulation user -5.599999905`<br>`undulation table` | 214 | V123 | Enter a specific geoidal undulation value or use the internal table of geoidal undulations |
| UNLOCKOUT | unlockout prn<br>`unlockout 8`<br>*(prn 1 to 32 for gps channels, 38 to 61 for glonass, and 120 to 138 for sbas)* | 138 | V123 | Reinstate a previously locked out satellite |
| UNLOCKOUT-ALL | unlockoutall<br>`unlockoutall` | 139 | V123 | Reinstate all previously locked out satellites |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| UNLOG | unlog [port] datatype<br>`unlog com1 bestposa` | 36 | V123 | Remove a specific log request from system |
| UNLOGALL | unlogall [port]<br>`unlogall com2` | 38 | V123 | Disable all logs on the specified port only |
| USERDATUM | userdatum semimajor flattening dx dy dz rx ry rz scale<br>`userdatum 6378206.400 294.97869820000 -12.0000 147.0000 192.0000 0.0000 0.0000 0.0000 0.000000000` | 78 | V123 | Enter customized ellipsoidal datum parameters |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| USEREXP-DATUM | userexpdatum semimajor flattening dx dy dz rx ry rz scale xvel yvel zvel xrvel yrvel zrvel scalev refdate<br>`userexpdatum 6378137.000 298.25722356280 0.000000000 0.000000000 0.000000000 0.00000000 0 0.000000000 0.000000000 0.000000000 0.000000000 0.000000000 0.0000 00000 0.000000000 0.000000000 0.000000000 0.000000000` | 783 | V123 | Enter customized ellipsoidal expanded datum parameters |
| UTMZONE | utmzone command parameter<br>`utmzone set 10` | 749 | V123 | Set UTM persistence, zone #, or meridian |
| WAAS-ECUTOFF | waasecutoff angle<br>`waasecutoff -2` | 505 | V123_SBAS | Set SBAS satellites' elevation cut-off angle |

| Command | Syntax and Example Input(s) | ID | Tag | Description |
|---|---|---|---|---|
| WAAS-TIMEOUT | waastimeout set [delay]<br>`waastimeout set 100`<br>*(the auto default is 180 s)* | 851 | V123_SBAS | Set amount of time receiver remains in an SBAS position if it stops receiving SBAS |

a. Inertial only applies when using an inertial navigation system such as NovAtel's SPAN products. Please visit our website at www.novatel.com for more information.

## NovAtel Format Logs

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| ALMANAC | Current GPS almanac info<br>`#msgs,`<br>`prn, week, seconds,`<br>`ecc,`$\mathring{\omega}$`,ωo, ω, mo, afo, af1,`<br>`n, a, inc-angle, sv config,`<br>`hlth-prn, hlth-alm, antspf,`<br>`next prn...` | 73 | V123 | log almanaca onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| AVEPOS | Position averaging<br>`lat, lon, ht, latσ, lonσ, hgtσ, posave, ave time, samples` | 172 | V123 | log aveposa onchanged |
| BESTPOS | Position data<br>`sol status, pos type, lat, lon, hgt, undulation, datum id#, latσ, lonσ, hgtσ, stn id, diff_age, sol_age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask` | 42 | V123 | log bestposa ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| BESTUTM | Best available UTM data<br>sol status, pos type, z#, zletter, northing, easting, hgt, undulation, datum id#, nσ, eσ, hgtσ, stn id, diff_age, sol_age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 726 | V123 | log bestutma ontime 1 |
| BESTVEL | Velocity data<br>sol status, vel type, latency, age, hor spd, trk gnd, vert spd, rsrvd | 99 | V123 | log bestvela ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| BESTXYZ | Cartesian coord pos<br>p-solstat, p-type, p-x, p-y, p-z, p-xσ, p-yσ, p-zσ, v-solstat, v-type, v-x, v-y, v-z, v-xσ, v-yσ, v-zσ, stnid, v-latency, diff_age, sol_age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 241 | V123 | log bestxyza ontime 1 |
| BSLNXYZ | RTK XYZ baseline<br>solstat, p-type, p-x, p-y, p-z, p-xσ, p-yσ, p-zσ, stnid, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 686 | V123_RT20<br>V23_RT2<br>V3_HP | log bslnxyza onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| CLOCK-MODEL | Clock model matrices<br>`clockstat, reject, noiset, updatet, params[1x3], covdata[3x3], rangebias, rangebiasrate, change` | 16 | V123 | log clockmodela ontime 1 |
| CLOCK-STEERING | Clock steering status<br>`source, steeringstate, period, pulsewidth, bandwidth, slope, offset, driftrate` | 26 | V123 | log clocksteeringa onchanged |
| CMRDESC | Base station description info | 310 | V123_RT20<br>V23_RT2 | log cmrdesc ontime 10 5 |
| CMROBS | Base station satellite observation info | 103 | V123_RT20<br>V23_RT2 | log cmrobs ontime 2 |
| CMRREF | Base station position info | 105 | V123_RT20<br>V23_RT2 | log cmrref ontime 10 |
| CMRPLUS | CMR+ output message | 717 | V123_RT20<br>V23_RT2 | log cmrplus ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| COM-CONFIG | Current COM port config<br>`#ports, port, baud, parity, databits, stopbits, handshake, echo, breaks, rxtype, txtype, response` | 317 | V123 | log comconfiga once |
| DIFFCODE-BIASES | Differential code biases being used<br>`#bias_sets, bias_type, [array of 40 biases (ns)], next array ...` | 914 | V123 | log diffcodebiases once |
| EXTRXHW-LEVELS | Extended receiver hardware levels<br>`sytem v, minos v, l-band v, l5 v, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd` | 843 | V3_G | log extrxhwlevels ontime 60 |
| GLMLA | GLONASS almanac data<br>`$glmla, #alm, alm#, slot, N, hlth & freq, ecc, ΔTdot, ω, τ16msb, ΔT,tλ, λ, Δi, τ12lsb, t` | 859 | V1G23_G | log glmla onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GLOCLOCK | GLONASS clock information<br>`rsrvd, rsrvd, rsrvd,`<br>`sat type, n4, tau gps, na,`<br>`tau_c, b1, b2, kp` | 719 | V1G23_G | log glocka ontime 1 |
| GLO-ALMANAC | Decoded GLONASS almanac<br>`#recs, week, time`[a]`, slot,`<br>`freq, sat type, health,`<br>`tlambda n, lambda n,`<br>`delta i, ecc, arg perigee,`<br>`delta t,delta td, tau,`<br>`next message...` | 718 | V1G23_G | log gloalmanaca onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GLO-EPHEMERIS | GLONASS ephemeris data<br>sloto, freqo, sat type, rsrvd, e week, e time, t offset, Nt, rsrvd, rsrvd, issue, health, posx, posy, posz, velx, vely, velz, ls accx, ls accy, ls accz, tau_n, delta_tau_n, gamma, tk, p, ft, age, flags | 723 | V1G23_G | log gloephemerisa onchanged |
| GLORAW-ALM | Raw GLONASS almanac<br>week, time [a], #recs, string, rsrvd, next rec... | 720 | V1G23_G | log glorawalma onchanged |
| GLORAW-EPHEM | Raw GLONASS ephemeris data<br>sloto, freqo, sigchan, week, time [a], #recs, string, rsrvd, next rec... | 792 | V1G23_G | log glorawephema onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GLORAW-FRAME | Raw GLONASS frame data<br>`frame#, sloto, freqo, week, time [a], frame decode, sigchan, #recs,string, rsrvd, next rec...` | 721 | V1G23_G | log glorawframea onchanged |
| GLORAW-STRING | Raw GLONASS string data<br>`slot, freq, string, rsrvd` | 722 | V1G23_G | log glorawstringa onchanged |
| GPALM | Almanac data<br>`$gpalm, #msgs, msg#, prn, gps wk, sv health, ecc, alm ref time, incl angle, omegadot, rt axis, omega, long asc node,` $m_o$, $a_{f0}$, $a_{f1}$, `next msg...` | 217 | V123_NMEA | log gpalm onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GPGGA | GPS fix data and undulation<br>`$gpgga, utc, lat, lat dir, lon, lon dir, gps qual, #sats, hdop, alt, alt units, undulation, undulation units, age, stn id` | 218 | V123_NMEA | log gpgga ontime 1 |
| GPGGA-LONG | Fix data and undulation with extra precision<br>`$gpgga, utc, lat, lat dir, lon, lon dir, gps qual, #sats, hdop, alt, alt units, undulation, undulation units, age, stn id` | 521 | V123_NMEA | log gpggalong ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GPGGARTK | GPS fix data with extra precision<br>`$gpgga, utc, lat, lat dir, lon, lon dir, gps qual, #sats, hdop, alt, alt units, rsrvd, rsrvd, age, stn id` | 259 | V123_NMEA | log gpggartk ontime 1 |
| GPGLL [b] | Geographic position - lat/lon<br>`$gpgll, lat, lat dir, lon, lon dir, utc, data status, mode ind` | 219 | V123_NMEA | log gpgll ontime 1 |
| GPGRS [b] | GPS range residuals for each satellite<br>`$gpgrs, utc, mode, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd, rsrvd` | 220 | V123_NMEA | log gpgrs ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GPGSA [b] | GPS DOP and active satellites<br>`$gpgsa, mode man/auto, mode 123, prn, prn, prn, prn, prn, prn, prn, prn, prn, prn, prn, pdop, hdop, vdop` | 221 | V123_NMEA | log gpgsa ontime 1 |
| GPGST [b] | Pseudorange measurement noise stats<br>`$gpgst, utc, rms, smjr std, smnr std, orientation, lat std, lon std, alt std` | 222 | V123_NMEA | log gpgst ontime 1 |
| GPGSV [b] | GPS satellites in view<br>`$gpgsv, #msgs, msg#, #sats, prn, elev, azimuth, snr, next sat...` | 223 | V123_NMEA | log gpgsv ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GPRMB [b] | Generic navigation info<br>`$gprmb, data status, xtrack, dir, origin id, dest id, dest lat, lat dir, dest lon, lon dir, range, bearing, vel, arr status, mode ind` | 224 | V123_NMEA | log gprmb ontime 1 |
| GPRMC [b] | GPS specific info<br>`$gprmc, utc, pos status, lat, lat dir, lon, lon dir, speed kn, track true, date, mag var, mag var dir, mode ind` | 225 | V123_NMEA | log gprmc ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| GPSEPHEM | GPS ephemeris data<br>prn, tow, health, iode1, iode2, week, z week, toe, a, dn, m0, ecc, w, cuc, cus, crc, crs, cic, cis, $i_0$, $i^0$, $w_0$, $\mathring{\omega}$, iodc, toc, tgd, af0, af1, af2, as, n, ura | 7 | V123 | log gpsephema onchanged |
| GPVTG [b] | Track made good and ground speed<br>$gpvtg, track true, t ind, track made good, m track ind, speed kn, n speed ind, speed km, k speed ind, mode ind | 226 | V123_NMEA | log gpvtg ontime 1 |
| GPZDA | UTC time and date<br>$gpzda, utc, day, month, year, rsrvd, rsrvd | 227 | V123_NMEA | log gpzda ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| IONUTC | Ionospheric/UTC info<br>a0, a1, a2, a3, b0, b1, b2, b3, utcwn, tot, a0, a1, wnlsf, dn, deltat ls, deltat lsf, rsrvd | 8 | V123 | log ionutca onchanged |
| LBANDINFO | L-Band configuration info<br>freq, baud, id, rsrvd, osn, vbssub, vbsexpwk, vbsexps, hpsub, hpexp week, hpexps, hpsub, mode | 730 | V13_VBS<br>V3_HP<br>V13_CDGPS | log lbandinfoa ontime 1 |
| LBANDSTAT | L-Band status info<br>freq, $c/n_0$, locktime, rsrvd, tracking, vbsstat, #bytes, #gooddgps, #baddata, rsrvd, hpstat2, #byteshp, hpstat, rsrvd | 731 | V13_VBS<br>V3_HP<br>V13_CDGPS | log lbandstatsa ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| LOGLIST | A list of system logs<br>`#logs, port, message, message type, rsrvd, trigger, period, offset, hold, next log...` | 5 | V123 | log loglista once |
| MARKPOS<br>MARK2POS | Position at mark (1 or 2) in event<br>`solstat, postype, lat, lon, hgt, undulation, datumid#, latσ, lonσ, hgtσ, stnid, diffage, solage, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask` | 181<br>615 | V123 | log markposa onnew<br>log mark2posa onnew |
| MARKTIME<br>MARK2TIME | Time of mark (1 or 2) input event<br>`week, s, offset, offsetstd, utcoffset, status` | 231<br>616 | V123 | log marktimea onnew<br>log mark2timea onnew |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| MATCHED-POS | Time matched RTK pos<br>solstat, postype, lat, lon, hgt, undulation, datumid#, latσ, lonσ, hgtσ, stnid, rsrvd, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 96 | V123_RT20<br>V12_RT2<br>V3_HP | log matchedposa onchanged |
| MATCHED-XYZ | Time matched RTK Cartesian pos<br>p-solstat, postype, p-x, p-y, p-z, p-xσ, p-yσ, p-zσ, stnid, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 242 | V123_RT20<br>V23_RT2<br>V3_HP | log matchedxyza onchanged |
| NAVIGATE | Navigation waypoint status<br>solstat, ptype, vtype, navtype, dist, bearing, atrack, xtrack, eta wk, eta s | 161 | V123 | log navigatea ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| OMNIHPPOS | OmniSTAR XP or HP pos data<br>`solstat, postype, lat, lon, hgt, undltn, datumid#, latσ, lonσ, hgtσ, stnid, diff age, sol age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask` | 495 | V3_HP | log omnihpposa ontime 1 |
| OMNIVIS | OmniSTAR satellite visibility list<br>`valid?, #recs, link id, app flag, sat name, app week, app sec, freq, bit rate, service id, ellip dist, global elev, next rec...` | 860 | V3_HP<br>V13_VBS | log omnivisa ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| PASSAUX<br>PASSCOMn (n=1,2,3)<br>PASSUSBn (n=1,2,3) | Port pass-through logs to redirect data<br>`#bytes, data, next byte...` | 690<br>233-235<br>607-609 | V123 | log passauxa *or*<br>log passcom3a *or*<br>log passusb2a<br>onchanged |
| PASSXCOMn (n=1,2) | Virtual pass-through logs redirect data<br>*as passaux above* | 405 to 406 | V123 | log passxcom1<br>onchanged |
| PORTSTATS | Port stats<br>`#ports, port, rx chars, tx chars, acc rx chars, dropped chars, interrupts, breaks, par err, fram err, overruns, next port...` | 72 | V123 | log portstata once |
| PSRDOP | DOPs of current SVs<br>`gdop, pdop, hdop, htdop, tdop, cutoff, #prns, prn, next prn...` | 174 | V123 | log psrdopa<br>onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| PSRPOS | Pseudorange position<br>`solstat, postype, lat, lon, hgt, undltn, datumid#, latσ, lonσ, hgtσ, stnid, diff age, sol age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask` | 47 | V123 | log psrposa ontime 1 |
| PSRTIME | Time offsets from pseudorange filter<br>`#recs, system, offset, offset stdv, next prn...` | 881 | V123 | log psrtimea ontime 1 |
| PSRVEL | Pseudorange velocity<br>`solstat, vtype, latency, age, horspd, trkgnd, vertspd, rsrvd` | 100 | V123 | log psrvela ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| PSRXYZ | Pseudorange Cartesian position<br>p-solstat, postype, p-x,<br>p-y, p-z, p-xσ, p-yσ, p-zσ,<br>v-solstat, v-type, v-x, v-y,<br>v-z, v-xσ, v-yσ, v-zσ,<br>stnid, v-latency, diff age,<br>sol age, #SV, #solnSV,<br>rsrvd, rsrvd, rsrvd,<br>ext sol stat, rsrvd, sigmask | 243 | V123 | log psrxyza ontime 1 |
| RANGE | Satellite range info<br>#obs,prn/slot[c], glofreq,<br>psr, psr std, adr, adr std,<br>dopp,c/no,locktime,<br>ch-tr-status, next obs... | 43 | V123 | log rangea ontime 30 |
| RANGECMP | Compressed RANGE log<br>#obs,1st range record,<br>next obs... | 140 | V123 | log rangecmpa ontime 10 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RANGE-GPSL1 | L1 version of RANGE log<br>`#obs, prn, rsrvd, psr, psr std, adr, adr std, dopp, c/no,locktime,ch-tr-status, next obs...` | 631 | V123 | log rangegpsl1a ontime 30 |
| RAWALM | Raw almanac<br>`refweek, refsecs,#subframes, svid, data,next subframe...` | 74 | V123 | log rawalma onchanged |
| RAWEPHEM | Raw ephemeris<br>`prn, refweek, refsecs, subframe1, subframe2, subframe3` | 41 | V123 | log rawephema onchanged |
| RAWGPS-SUBFRAME | Raw subframe data<br>`decode#, prn, subfr id, data, chan` | 25 | V123 | log rawgpssubframea onnew |
| RAWGPS-WORD | Raw navigation word<br>`prn, nav word` | 407 | V123 | log rawgpsworda onnew |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RAWLBAND-FRAME | Raw L-Band frame data<br>`frame#, channelcode, data` | 732 | V13_CDGPS | log rawlbandframeaonnew |
| RAWLBAND-PACKET | Raw L-Band data packet<br>`#recs, data` | 733 | V13_VBS<br>V3_HP | log rawlbandpacketaonnew |
| RAWWAAS-FRAME | Raw SBAS frame data<br>`decode#, prn, waas msg id, data, chan` | 287 | V123_SBAS | log rawwaasframeaonnew |
| REFSTATION | Ref. station pos and health<br>`status, x, y, z, health, stn type, stn id` | 175 | V123_RT20<br>V3_RT2 | log refstationaonchanged |
| RTCA1 | Type 1 differential GPS corrections | 10 | V123_DGPS | log com2 rtca1 ontime 10 3 |
| RTCAEPHEM | Type 7 ephemeris information | 347 | V123_DGPS | log com2 rtcaephem ontime 10 7 |
| RTCAOBS | Type 7 base station observations | 6 | V123_RT20<br>V23_RT2 | log com2 rtcaobs ontime 2 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTCAOBS2 | Type 7 base station observations 2 | 805 | V123_RT20 V23_RT2 | log com2 rtcaobs2 ontime 2 |
| RTCAREF | Type 7 base station parameters | 11 | V123_RT20 V23_RT2 | log com2 rtcaref ontime 10 |
| RTCM1 | Type 1 differential GPS corrections | 107 | V123_DGPS | log rtcm1ontime 10 3 |
| RTCM3 | Type 3 base station parameters | 117 | V123_RT20 V23_RT2 | log rtcm3 ontime 10 |
| RTCM9 | Type 9 partial differential corrections | 275 | V23_DGPS | log rtcm9 ontime 10 |
| RTCM15 | Type 15 ionospheric corrections | 307 | V123_DGPS | log rtcm15 ontime 10 |
| RTCM16 | Type16 special message | 129 | V123_DGPS | log rtcm16 once |
| RTCM16T | Type16T special message | 131 | V123_RT20 V23_RT2 | log rtcm1819 ontime 2 |
| RTCM1819 | Type18 and Type 19 raw measurements | 260 | V123_RT20 V23_RT2 | log rtcm2021 ontime 10 |
| RTCM2021 | Type 20 and Type 21 measurement corrections | 370 | V123_RT20 V23_RT2 | log rtcm22 ontime 10 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTCM22 | Type 22 extended base parameters | 118 | V123_RT20 V23_RT2 | log rtcm23 ontime 5 |
| RTCM23 | Type 23 antenna type definition record | 665 | V123_RT20 V23_RT2 | log rtcm24 ontime 5 |
| RTCM24 | Type 24 Antenna Reference Point (ARP) parameters | 667 | V1G23_G & V123_RT20 V23_RT2 | log rtcm31 ontime 2 |
| RTCM31 | Type 31 GLONASS differential corrections | 864 | V1G23_G & V123_RT20 V23_RT2 | log rtcm32 ontime 2 |
| RTCM32 | Type 32 GLONASS base station parameters | 873 | V1G23_G | log rtcm36 once |
| RTCM36 | Type 36 special message | 875 | V123_RT20 V23_RT2 | log rtcm59 ontime 10 |
| RTCM36T | Type 36T special message | 877 | V1G23_G & V123_DGPS | log rtcm59glo ontime 2 |
| RTCM1001 | L1-Only GPS RTK Observables | 772 | V123_RT20 V23_RT2 | log rtcm1001 ontime 10 3 |
| RTCM1002 | Extended L1 GPS RTK Observables | 774 | V123_RT20 V23_RT2 | log rtcm1002 ontime 7 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTCM1003 | L1/L2 GPS RTK Observables | 776 | V123_RT20<br>V23_RT2 | log rtcm1003 ontime 7 |
| RTCM1004 | Extended L1/L2 GPS RTK Observables | 770 | V123_RT20<br>V23_RT2 | log rtcm1004 ontime 7 |
| RTCM1005 | RTK Base Station ARP | 765 | V123_RT20<br>V23_RT2 | log rtcm1005 ontime 3 |
| RTCM1006 | RTK Base ARP & Antenna Height | 768 | V123_RT20<br>V23_RT2 | log rtcm1006 ontime 3 |
| RTCM1007 | Extended Antenna Descriptor & Setup | 852 | V123_RT20<br>V23_RT2 | log rtcm1007 ontime 10 |
| RTCM1008 | Extended Antenna Reference Station Description & Serial Number | 854 | V123_RT20<br>V23_RT2 | log rtcm1008 ontime 10 |
| RTCM1009 | L1-Only GLONASS RTK | 885 | V123_RT20<br>V23_RT2 | log rtcm1009 ontime 3 |
| RTCM1010 | Extended L1-Only GLONASS RTK | 887 | V123_RT20<br>V23_RT2 | log rtcm1010 ontime 3 |
| RTCM1011 | GLONASS L1/L2 RTK | 889 | V123_RT20<br>V23_RT2 | log rtcm1011 ontime 3 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTCM1012 | Extended GLONASS L1/L2 RTK | 891 | V123_RT20<br>V23_RT2 | log rtcm1012 ontime 3 |
| RTCM1019 | GPS Ephemeris | 893 | V123_RT20<br>V23_RT2 | log rtcm1019 ontime 3 |
| RTCM1020 | GLONASS Ephemeris | 895 | V123_RT20<br>V23_RT2 | log rtcm1020 ontime 3 |
| RTKDATA | RTK specific info<br>sol status, pos type,<br>rtk info, #SV, #solnSV,<br>#obs, #multi, rsrvd, ext sol<br>stat, rsrvd, sig mask,<br>search state, #lane,<br>[c: 3x3], Δx, Δy, Δz,<br>xσ, yσ, zσ, ref prn, #svs,<br>prn/slot[c], ambiguity type,<br>residual, next sv... | 215 | V123_RT20<br>V23_RT2 | log rtkdata onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTKPOS | RTK low latency pos data<br>`sol status, pos type, lat, lon, hgt, undulation, datum id#, latσ, lonσ, hgtσ, stn id, diff age, sol age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask` | 141 | V123_RT20<br>V23_RT2 | log rtkposa ontime 1 |
| RTKVEL | RTK velocity<br>`sol status, vel type, latency, age, hor spd, track over gnd, vert spd, rsrvd` | 216 | V123_RT20<br>V23_RT2 | log rtkvela ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RTKXYZ | RTK Cartesian coord pos<br>pos sol status, pos type, p-x, p-y, p-z, p-xσ, p-yσ, p-zσ, vel sol status, v-x, v-y, v-z, v-xσ, v-yσ, v-zσ, stn id, v latency, diff age, sol age, #SV, #solnSV, #obs, #multi, rsrvd, ext sol stat, rsrvd, sig mask | 244 | V123_RT20<br>V23_RT2 | log rtkxyza ontime 1 |
| RXCONFIG | Receiver config status<br>embedded header, embedded msg, embedded crc, next embedded command... | 128 | V123 | log rxconfiga once |
| RXHW-LEVELS | Receiver hardware levels<br>temp, ant current, core v, supply v, rf v, internal lna v, rsrvd, rsrvd, lna v | 195 | V3 | log rxhwlevelsa ontime 60 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| RXSTATUS | Self-test status<br>`error, #stats, rxstat, rxstat pri, rxstat set, rxstat clear, aux1stat, aux1stat pri, aux1stat set, aux1stat clear, aux2stat, aux2stat pri, aux2stat set, aux2stat clear, aux3stat, aux3stat pri, aux3stat set, aux3stat clear, next stat...` | 93 | V123 | log rxstatusa onchanged |
| RXSTATUS-EVENT | Status event indicator<br>`status, bit pos, event, descrip` | 94 | V123 | log rxstatuseventa onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| SATVIS | Satellite visibility<br>satellite visibility?,<br>complete gps almanac?,<br>#sats, prn/slot[c], glofreq,<br>health, elev, az, true dop,<br>apparent dop, next sat... | 48 | V123 | log satvisa ontime 60 |
| SATXYZ | ECEF satellite Cartesian pos<br>rsrvd, #sats, prn/slot[c], x,<br>y, z, clk corr, iono corr,<br>tropo corr, rsrvd, rsrvd,<br>next sat... | 270 | V123 | log satxyza ontime 1 |
| TIME | Receiver time information<br>clock status, offset,<br>offset std, utc offset,<br>utc year, utc month,<br>utc day, utc hour, utc min,<br>utc ms, utc status | 101 | V123 | log timea ontime 1 |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| TIMESYNC | Synchronize receiver times<br>`week, ms, time status` | 492 | V123 | log timesynca ontime 1 |
| TRACKSTAT | Satellite tracking status<br>`sol status, pos type, ecutoff, #chans, prn/slot`[c]`, glofreq, ch-tr-status, psr, dop, cno, locktime, psr res, reject code, psr weight, next chan...` | 83 | V123 | log trackstata ontime 1 |
| VALID-MODELS | Receiver model/expiry date<br>`#mods, model, expyear, expmonth, expday, next mod...` | 206 | V123 | log validmodelsa once |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| VERSION | Receiver version numbers<br>#components, type, model, psn, hw version, sw version, boot version, compile date, compile time,<br>next component... | 37 | V123 | log versiona once |
| WAAS0 | Which PRN to remove from solution<br>prn | 290 | V123_SBAS | log waas0a onchanged |
| WAAS1 | PRN mask assignment<br>prn, mask, iodp | 291 | V123_SBAS | log waas1a onchanged |
| WAAS2 | Fast corrections slots 0-12<br>prn,iodf,iodp,prc0,prc1, prc2,prc3,prc4,prc5,prc6, prc7,prc8,prc9,prc10,prc11, prc12,udre0,udre1,udre2, udre3,udre4,udre5,udre6, udre7,udre8,udre9,udre10, udre11,udre12 | 296 | V123_SBAS | log waas2a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS3 | Fast corrections slots 13-25<br>`prn, iodf, iodp, prc13, prc14,prc15,prc16,prc17, prc18,prc19,prc20,prc21, prc22,prc23,prc24,prc25, udre13,udre14,udre15, udre16,udre17,udre18, udre19,udre20,udre21, udre22,udre23,udre24,udre25` | 301 | V123_SBAS | log waas3a onchanged |
| WAAS4 | Fast corrections slots 26-38<br>`prn,iodf,iodp,prc26,prc27, prc28,prc29,prc30,prc31, prc32,prc33,prc34,prc35, prc36,prc37,prc38,udre26, udre27,udre28,udre29,udre30, udre31,udre32,udre33,udre34, udre35,udre36,udre37,udre38` | 302 | V123_SBAS | log waas4a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS5 | Fast corrections slots 39-50<br>prn,iodf,iodp,prc39,prc40,<br>prc41,prc42,prc43,prc44,<br>prc45,prc46,prc47,prc48,<br>prc49,prc50,prc21,udre39,<br>udre40,udre41,udre42,udre43,<br>udre44,udre45,udre46,udre47,<br>udre48,udre49,udre50,<br>udre51(do not use) | 303 | V123_SBAS | log waas5a<br>onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS6 | Integrity message<br>prn,iodf2,iodf3,iodf4,iodf5,<br>udre0,udre1,udre2,udre3,<br>udre4,udre5,udre6,udre7,<br>udre8,udre9,udre10,udre11,<br>udre12,udre13,udre14,udre15,<br>udre16,udre17,udre18,udre19,<br>udre20,udre21,udre22,udre23,<br>udre24,udre25,udre26,udre27,<br>udre28,udre29,udre30,udre31,<br>udre32,udre33,udre34,udre35,<br>udre36,udre37,udre38,udre39,<br>udre40,udre41,udre42,udre43,<br>udre44,udre45,udre46,udre47,<br>udre48,udre49,udre50,<br>udre51(invalid) | 304 | V123_SBAS | log waas6a<br>onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS7 | Fast correction degradation<br>prn,latency,iodp,spare bits,<br>ai(0),ai(1),ai(2),ai(3),<br>ai(4),ai(5), ai(6), ai(7),<br>ai(8),ai(9), ai(10),ai(11),<br>ai(12),ai(13),ai(14),ai(15),<br>ai(16),ai(17),ai(18),ai(19),<br>ai(20),ai(21),ai(22),ai(23),<br>ai(24),ai(25),ai(26),ai(27),<br>ai(28),ai(29),ai(30),ai(31),<br>ai(32),ai(33),ai(34),ai(35),<br>ai(36),ai(37),ai(38),ai(39),<br>ai(40),ai(41),ai(42),ai(43),<br>ai(44),ai(45),ai(46),ai(47),<br>ai(48),ai(49),ai(50),<br>ai(51)(invalid, do not use) | 305 | V123_SBAS | log waas7a<br>onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS9 | GEO navigation message<br>prn, iodn, $t_0$, ura, x, y, z, xvel, yvel, zvel, xaccel, yaccel, zaccel, $a_{fo}$, $a_{f1}$ | 306 | V123_SBAS | log waas9a onchanged |
| WAAS10 | Degradation factor<br>prn, $b_{rcc}$, $c_{ltc\_lsb}$, $c_{ltc\_v1}$, $i_{ltc\_v1}$, $c_{ltc\_v0}$, $i_{ltc\_v1}$, $c_{geo\_lsb}$, $c_{geo\_v}$, $i_{geo}$, $c_{er}$, $c_{iono\_step}$, $i_{iono}$, $c_{iono\_ramp}$, $rss_{udre}$, $rss_{iono}$, spare bits | 292 | V123_SBAS | log waas10a onchanged |
| WAAS12 | SBAS network time & UTC<br>prn, a1, a0, seconds, week, dtls, wnlsf, dn, dtlsf, utcid, gpstow, gpswn, glo ind, rsrvd | 293 | V123_SBAS | log waas12a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS17 | GEO almanac message<br>prn, #entries, data id, entry prn, health, x, y, z, x vel, y vel, z vel, next entry..., $t_0$ | 294 | V123_SBAS | log waas17a onchanged |
| WAAS18 | IGP mask<br>prn, #bands, band#, iodi, igp mask, spare bit | 295 | V123_SBAS | log waas18a onchanged |
| WAAS24 | Mixed fast/slow corrections<br>prn, prc0, prc1, prc2, prc3, prc4, pcr5, udre0, udre1, udre2, udre3, udre4, udre5, iodp, block id, iodf, spare, vel, mask1, iode1, dx1, dy1, dz1, $da^{f0}$, mask2, iode2, ddx, ddy, ddz, $da^{f1}$, $t_0$, iodp, corr spare | 297 | V123_SBAS | log waas24a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS25 | Long-term slow corrections<br>source prn,<br>1st vel, 1st mask1,<br>1st iode1, 1st dx1, 1st dy1,<br>1st dz1, 1st $da^{f0}$, 1st mask2,<br>1st iode2, 1st ddx, 1st ddy,<br>1st ddz, 1st $da^{f1}$, 1st $t_0$,<br>1st iodp, 1st corr spare,<br>2nd vel, 2nd mask1,<br>2nd iode1, 2nd dx1, 2nd dy1,<br>2nd dz1, 2nd $da^{f0}$, 2nd mask2,<br>2nd iode2, 2nd ddx, 2nd ddy,<br>2nd ddz, 2nd $da^{f1}$, 2nd $t_0$,<br>2nd iodp, 2nd corr spare | 298 | V123_SBAS | log waas25a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS26 | Iono-delay corrections<br>prn, band#, block id, #pts, $igp_{vde}$, givei, next pt..., iode, spare | 299 | V123_SBAS | log waas26a onchanged |
| WAAS27 | SBAS service message<br>prn, iods, #messages, message#, priority code, dudre inside, #regs, lat1,lon1, lat2, lon2, shape,next reg..., $t_0$ | 300 | V123_SBAS | log waas27a onchanged |
| WAAS32 (CDGPS) | Fast correction slots 0-10<br>prn,iodp,prc0,prc1,prc2, prc3,prc4,prc5,prc6,prc7, prc8,prc9,prc10,udre0,udre1, udre2,udre3,udre4,udre5, udre6,udre7,udre8,udre9, udre10 | 696 | V13_CDGPS | log waas32a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WAAS33 (CDGPS) | Fast correction slots 11-21<br>`prn,iodp,prc11,prc12,prc13,`<br>`prc14,prc15,prc16,prc17,`<br>`prc18,prc19,prc20,prc21,`<br>`udre11,udre12,udre13,udre14,`<br>`udre15,udre16,udre17,udre18,`<br>`udre19,udre20,udre21` | 697 | V13_CDGPS | log waas33a onchanged |
| WAAS34 (CDGPS) | Fast correction slots 22-32<br>`prc22,prc23,prc24,prc25,`<br>`prc26,prc27,prc28,prc29,`<br>`prc30,prc31,prc32,udre22,`<br>`udre23,udre24,udre25,udre26,`<br>`udre27,udre28,udre29,udre30,`<br>`udre31,udre32` | 698 | V13_CDGPS | log waas34a onchanged |

| Log | Description and fields after header | ID | Tag | Recommended Input |
|---|---|---|---|---|
| WASS35 (CDGPS) | Fast correction slots 33-43<br>`prc33,prc34,prc35,prc36, prc37,prc38,prc39,prc40, prc41,prc42,prc43,udre33, udre34,udre35,udre36,udre37, udre38,udre39,udre40,udre41, udre42, udre43` | 699 | V13_CDGPS | log waas35a onchanged |
| WAAS45 (CDGPS) | Slow corrections<br>`prn, mask1, iode1, dx1, dy1, dz1, ddx, ddy, ddz, da`$^{f0}$`1, t`$_0$`1, mask2, iode2, dx1, dy1, dz1, ddx, ddy, ddz, da`$^{f0}$`2, t`$_0$`2, iodp` | 700 | V13_CDGPS | log waas45a onchanged |
| WAASCORR | SBAS range corrections use<br>`#sats,prn, iode, psr corr, corr stdv,next sat...` | 313 | V123_SBAS | log waascorra ontime 1 |

a. GPS Time, in milliseconds (binary data) or seconds (ASCII data)

b. If the NMEATALKER command is set to AUTO, the talker (the first 2 characters after the $ in the log header) is set to GP (GPS satellites only), GL (GLONASS satellites only), or GN ( both systems' satellites).
c. PRN 1 to 32 for GPS channels, 38 to 61 for GLONASS, and 120 to 138 for SBAS

**Tag Meanings**

| | |
|---|---|
| V123 | Features available on OEMV-1, OEMV-1G, OEMV-2 or OEMV-3-based products. If a feature is not available on a card, its number is omitted, for example, V23, V13 or V3. |
| V123_RT20 | Features available only with receivers equipped with the RT-20 option |
| V23_RT2 | Features available only with receivers equipped with the RT-2 option |
| V123_DGPS | Feature used when operating in differential mode |
| V123_NMEA | National Marine Electronics Association format |
| V123_SBAS | SBAS messages available when tracking an SBAS satellite (refer to the *GPS+ Reference Manual*) |
| V3_HP | OmniSTAR high performance (HP) or extra performance (XP), and virtual base station (VBS) available with an OmniSTAR subscription (refer to the *GPS+ Reference Manual)* |
| V13_VBS | OmniSTAR VBS available with an OmniSTAR subscription |
| V13_CDGPS | The free Canada-Wide Differential Global Positioning System (CDGPS) available without a subscription (refer to the *GPS+ Reference Manual*) |
| V1G23_G | GLONASS positioning available (refer to the *GPS+ Reference Manual*) |
| V3_G | Available only on OEMV-3-based products with the GLONASS option |
| V23_L2C | Capable of receiving the L2C signal (refer to the *GPS+ Reference Manual*) |