

NMEA format specifications

1 GPS related formats

1.1 GGA - Global Positioning System Fix Data

Time, Position and fix related data for a GPS receiver.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
\$--GGA,	hhmmss.ss,	llll.ll,	a,	yyyyy.yy,	a,	x,	xx,	x.x,	x.x,	M,	x.x,	M,	x.x,	xxxx	*hh

Field Number:

- 1) Universal Time Coordinated (UTC)
- 2) Latitude
- 3) N or S (North or South)
- 4) Longitude
- 5) E or W (East or West)
- 6) GPS Quality Indicator,
0 - fix not available,
1 - GPS fix,
2 - Differential GPS fix
- 7) Number of satellites in view, 00 - 12
- 8) Horizontal Dilution of precision
- 9) Antenna Altitude above/below mean-sea-level (geoid)
- 10) Units of antenna altitude, meters
- 11) Geoidal separation, the difference between the WGS-84 earth ellipsoid and mean-sea-level (geoid), "-" means mean-sea-level below ellipsoid
- 12) Units of geoidal separation, meters
- 13) Age of differential GPS data, time in seconds since last SC104 type 1 or 9 update, null field when DGPS is not used
- 14) Differential reference station ID, 0000-1023
- 15) Checksum

1.2 GSA - GPS DOP and active satellites

	1	2	3											14	15	16	17	18	
\$--GSA,	a,	a,	x,	x,	x,	x,	x,	x,	x,	x,	x,	x,	x,	x,	x,	x.x,	x.x,	x.x	*hh

Field Number:

- 1) Selection mode
- 2) Mode
- 3) ID of 1st satellite used for fix
- 4) ID of 2nd satellite used for fix
- ...
- 14) ID of 12th satellite used for fix
- 15) PDOP in meters
- 16) HDOP in meters
- 17) VDOP in meters
- 18) checksum

1.3 GSV - Satellites in view

	1	2	3	4	5	6	7	n	
\$--GSV,	x,	x,	x,	x,	x,	x,	x,	...*	hh

Field Number:

- 1) total number of messages
- 2) message number
- 3) satellites in view
- 4) satellite number
- 5) elevation in degrees

3 General formats

3.1 GLL - Geographic Position - Latitude/Longitude

```

      1      2 3      4 5      6 7
      |      | |      | |      | |
$--GLL,llll.ll,a,yyyy.yy,a,hmmss.ss,A*hh

```

Field Number:

- 1) Latitude
- 2) N or S (North or South)
- 3) Longitude
- 4) E or W (East or West)
- 5) Universal Time Coordinated (UTC)
- 6) Status A - Data Valid, V - Data Invalid
- 7) Checksum

3.2 GTD - Geographic Location in Time Differences

```

      1      2      3      4      5      6
      |      |      |      |      |      |
$--GTD,x.x,x.x,x.x,x.x,x.x*hh

```

Field Number:

- 1) time difference
- 2) time difference
- 3) time difference
- 4) time difference
- 5) time difference
- n) checksum

3.3 XTE - Cross-Track Error, Measured

```

      1 2 3      4 5      6
      | | |      | |      |
$--XTE,A,A,x.x,a,N,*hh

```

Field Number:

- 1) Status
 - V = LORAN-C Blink or SNR warning
 - V = general warning flag or other navigation systems when a reliable fix is not available
- 2) Status
 - V = Loran-C Cycle Lock warning flag
 - A = OK or not used
- 3) Cross Track Error Magnitude
- 4) Direction to steer, L or R
- 5) Cross Track Units, N = Nautical Miles
- 6) Checksum

3.4 ZDA - Time & Date

UTC, day, month, year and local time zone

```

      1      2 3 4      5 6 7
      |      | | |      | | |
$--ZDA,hmmss.ss,xx,xx,xxx,xx,xx*hh

```

Field Number:

- 1) Local zone minutes description, same sign as local hours
- 2) Local zone description, 00 to +- 13 hours
- 3) Year
- 4) Month, 01 to 12
- 5) Day, 01 to 31
- 6) Universal Time Coordinated (UTC)
- 7) Checksum

3.5 ZFO - UTC & Time from origin Waypoint

1	2	3	4
\$--ZFO,hhmmss.ss,hhmmss.ss,c--c*hh			

Field Number:

- 1) Universal Time Coordinated (UTC)
- 2) Elapsed Time
- 3) Origin Waypoint ID
- 4) Checksum