Science Engineering Associates, Inc.
114C Mansfield Hollow Rd./PO Box 605
Phone (860) 450-1717
Fax (860) 450-1707

GPS DATA FORMAT

Command	Description	Mnemonic	Bytes	Comments
00h All	Reserved			
01h AN, AP, AR, KG, NS, TL, TP, NMEA, SH, GARMIN	Latitude	LAT	4	SSDDMMHH
02h AN, AP, AR, KG, NS, TL, TP, NMEA, SH, GARMIN	Longitude	LON	4	SSDDMMHH
03h SH	Indicated Air Speed	IAS	2	HHHH Knots Divide by 10
04h AR, TL	Minimum Safe Altitude	MSA	2	HHHH KiloFeet Divide by 10
05h				
06h SH	Drift Angle	DRFA	2	HHHH Degrees Divide by 10
07h TL	Time Since Solution	TSS	2	HHHH Seconds Divide by 10
08h TP, NS, TL	Speed Over Ground	SOG	4	HHHHHHHH Knots Convert to long Divide by 100
09h AN, AP, AR, KG, TL, NMEA, SH, GARMIN	Ground Speed	GSP	2	HHHH Knots Divide by 10 or 100
0Ah AR, TL	Minimum Enroute Safe Altitude	MESA	2	HHHH KiloFeet Divide by 10
0Bh AP, AR, NS, KG, TL, NMEA, SH	Ground Track Angle	GTK	2	HHHH Degrees Divide by 10

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Command	Description	Mnemonic	Bytes	Comments
0Ch SH	Rate of Turn	ROT	2	HHHH Degrees/Second Divide by 10
0Dh AN, AR, NS, KG, TL, NMEA, SH, GARMIN	Magnetic Variation	MGV	4	SSHHHHHH Degrees Convert to long Divide by 10
0Eh SH	Outside Air Temperature "Total"	OAT	2	HHHH Degrees Celsius Divide by 10
0Fh SH	True Air Temperature "Static"	TAT	2	HHHH Degrees Celsius Divide by 10
10h TG, TV	Latitude	FLAT	4	HHHHHHHH Radians Float
11h TG, TV	Longitude	FLON	4	HHHHHHHH Feet Float
12h TG, TP, TV	Altitude	FALT	4	HHHHHHHH Feet Float
13h TG, TV	Real Time	RTIM	10	TTTTTTTT WWWW OOOOOOOO Use function
14h TG, TV	East Velocity	EVL	4	HHHHHHHH Meters/Second Float
15h TG, TV	North Velocity	NVL	4	HHHHHHHH Meters/Second Float
16h TG, TV	Up Velocity	UVL	4	HHHHHHHH Meters/Second Float
17h TP, AR, NMEA, TL	Time String	STIM	10	HH:MM:SS00 String

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Command	Description	Mnemonic	Bytes	Comments
18h TL, NMEA	Extended Latitude	ELAT	8	SSDDMM00HHHHHHHH
19h TL, NMEA	Extended Longitude	ELON	8	SSDDMM00HHHHHHHH
1Ah AN, AR, NS, TL	Estimated Position Error	EPE	2	HHHH Nautical Miles Divide by 10
1Bh TL, NMEA, GARMIN	Altitude	ALT	4	HHHHHHHH Feet Convert to long Divide by 10 or 100
1Ch TL, NS, SH	Pressure Altitude	PALT	4	HHHHHHHH Feet Convert to long Divide by 10
1Dh TL, SH	Barometric Altitude	BALT	4	HHHHHHHH Feet Convert to long Divide by 10
1Eh TP	True Heading	HDT	2	HHHH Degrees
1Fh TP, SH	Magnetic Heading	HDM	2	HHHH Degrees
20h AN	Heading	HDG	2	HHHH Degrees Divide by 10
21h AN, SH	True Air Speed	TAS	2	HHHH Knots Divide by 10
22h AN, SH	Wind Direction	WDR	2	HHHH Degrees Divide by 10
23h AN, SH	Wind Speed	WSP	2	HHHH Knots Divide by 10

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Command	Description	Mnemonic	Bytes	Comments
24h AN	Warning Codes	WR1	2	HHHH
25h AR, TL, GARMIN	Warning Codes	WR2	2	HHHH
26h TG, TV, NMEA, NS	Health Status	STA	2	HHHH
27h NMEA, TL, AR	Date String	SDAT	10	DD-MM-YY00 String
28h TL, SH	Rate of Climb	ROC	4	SSHHHHHH Feet/Minute Convert to long Divide by 10
29h TL	Desired Rate of Climb	DROC	4	SSHHHHHH Feet/Minute Convert to long Divide by 10
2Ah TL	Vertical Error from Profile	VEFP	4	SSHHHHHH Feet/Minute Convert to long Divide by 10
2Bh TL	Vertical Angle Error from Profile	VAEFP	4	SSHHHHHH Feet/Minute Convert to long Divide by 10
2Ch AR	GPS Depth of Field	DOP	2	HHHH Divide by 10
2Dh AR	Vertical Velocity	VVEL	2	HHHH Meters/Second Divide by 10
2Eh AR, NMEA	Satellite Track Count	STC	2	HHHH
2Fh NMEA, NS, AR	Altitude	MALT	4	HHHHHHHH Meters Convert to long Divide by 10 or 100

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Command	Description	Mnemonic	Bytes	Comments
30h AN	Record 7	R07	20	20 Bytes
31h AN	Record 8	R08	20	20 Bytes
32h AN	Record 9	R09	20	20 Bytes
33h AN	Record 10	R10	20	20 Bytes
34h AN	Record 11	R11	20	20 Bytes
35h AN	Record 12	R12	20	20 Bytes
36h AN	Record 13	R13	20	20 Bytes
37h AN	Record 14	R14	20	20 Bytes
38h TV	Single Precision LLA Position Time of Fix	FIX1	4	HHHHHHHH Float Seconds
39h TV	Velocity fix (ENU) Time of Fix	FIX2	4	HHHHHHHH Float Second
3Ah TV	X Velocity	XVEL	4	HHHHHHHH Float Meters/Second
3Bh TV	Y Velocity	YVEL	4	HHHHHHHH Float Meters/Second

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Command	Description	Mnemonic	Bytes	Comments
3Ch TV	Z Velocity	ZVEL	4	HHHHHHHH Float Meters/Second
3Dh TV	Velocity fix (XYZ) Time of Fix	FIX3	4	HHHHHHHH Float Seconds
3Eh TV	EULER Angle Attitude Time of Solution	FIX4	8	HHHHHHHHHHHHHHHH Double Seconds
3Fh TV	Roll	ROLL	4	HHHHHHHH Float Degrees
40h TV	Pitch	PIT	4	HHHHHHHH Float Degrees
41h TV	Azimuth	AZI	4	HHHHHHHH Float Degrees
42h TV	Double Latitude	DLAT	8	HHHHHHHHHHHHHHHH Double Radians
43h TV	Double Longitude	DLON	8	HHHHHHHHHHHHHHHH Double Radians
44h TV	Double Altitude	DALT	8	HHHHHHHHHHHHHHHH Double Meters
45h TV	Double Precision LLA Position Time of Fix	FIX5	4	HHHHHHHH Float Seconds
46h NS	Course Over Ground	COG	4	HHHHHHHH Degrees Convert to long Divide by 100
47h NS	Time	TIME	4	HHMMSSOO

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Command	Description	Mnemonic	Bytes	Comments
48h NMEA	Extended Time	ETIM	14	HH:MM:SS.HHH00 String
49h	Extended Time Since Solution	ETSS	4	HHHHHHHH Seconds Convert to long Divide by 1000
50h APP	Time of Validity	ATOV	8	HHHHHHHHHHHHHHHH Seconds Double to Float
51h APP	Roll	AROLL	2	HHHH Degrees Divide by 100
52h APP	Pitch	APIT	2	HHHH Degrees Divide by 100
53h APP	Heading	AHDG	2	HHHH Degrees Divide by 100
54h APP	Latitude	ALAT	4	HHHHHHHH Degrees Divide by (60*60*1000)
55h APP	Longitude	ALON	4	HHHHHHHH Degrees Divide by (60*60*1000)
56h APP	Altitude	AALT	4	HHHHHHHH Meters Divide by 100
57h APP	Speed	ASPD	2	HHHH Meters/Sec Divide by 100
58h APP	Track	ATRK	2	HHHH Degrees Divide by 100
59h APP	Long Accel	ALAC	2	HHHH Meters/Sec/Sec Divide by 2000

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Command	Description	Mnemonic	Bytes	Comments
5Ah APP	Tran Accel	ATAC	2	HHHH Meters/Sec/Sec Divide by 2000
5Bh APP	Down Accel	ADAC	2	HHHH Meters/Sec/Sec Divide by 2000
FEh All	Activity Counter	COUNTER	4	HHHHHHHH
FFh All	Receive Error Counter	ERROR	4	HHHHHHHH