

TABLE 4 - TALKER IDENTIFIER MNEMONICS
(Address Characters 1 and 2)

TALKER DEVICE		IDENTIFIER
AUTOPILOT:	General	*AG
	Magnetic	AP
COMMUNICATIONS:	Digital Selective Calling (DSC)	*CD
	Satellite	*CS
	Radio-Telephone (MF/HF)	*CT
	Radio-Telephone (VHF)	*CV
	Scanning Receiver	*CX
DECCA Navigation		DE
Direction Finder		*DF
Electronic Chart Display & Information System (ECDIS)		EC
Emergency Position Indicating Beacon (EPIRB)		*EP
Engineroom Monitoring Systems		ER
Global Positioning System (GPS)		GP
HEADING SENSORS:	Compass, Magnetic	*HC
	Gyro, North Seeking	*HE
	Gyro, Non-North Seeking	HN
Integrated Instrumentation		II
Integrated Navigation		IN
LORAN:	Loran-A	LA
	Loran-C	LC
OMEGA Navigation System		OM
Proprietary Code		P
Radar and/or ARPA		*RA
Sounder, depth		*SD
Electronic positioning system, other/general		TR
Sounder, scanning		SS
Turn Rate Indicator		*TI
TRANSIT Navigation System		TR
VELOCITY SENSORS:	Doppler, other/general	*VD
	Speed Log, Water, Magnetic	VM
	Speed Log, Water, Mechanical	VW
TRANSDUCER		YX
TIMEKEEPERS, TIME/DATE:	Atomic Clock	ZA
	Chronometer	ZC
	Quartz	ZQ
	Radio Update, WWV or WWVH	ZV
Weather Instruments		WI

*

Designated by I.E.C. for use with I.M.O. marine electronic devices. This is the minimum requirement for equipment that is specified by I.M.O. to meet S.O.L.A.S. regulations.

TABLE 5 - APPROVED SENTENCE FORMATTERS

AAM	-	Waypoint Arrival Alarm.....	22
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BOD	-	Bearing, Origin to Destination.....	24
BWC	-	Bearing & Distance to Waypoint, Great Circle.....	24
BWR	-	Bearing & Distance to Waypoint, Rhumb Line.....	24
BWW	-	Bearing, Waypoint to Waypoint.....	24
DBT	-	Depth Below Transducer.....	24
DCN	-	Decca Position.....	25
*DPT	-	Depth.....	25
*FSI	-	Frequency Set Information.....	25
GGA	-	Global Positioning System Fix Data.....	26
GLC	-	Geographic Position, Loran-C.....	26
GLL	-	Geographic Position, Latitude/Longitude.....	27
GSA	-	GPS DOP and Active Satellites.....	27
GSV	-	GPS Satellites in View.....	27
GXA	-	TRANSIT Position.....	28
*HDG	-	Heading, Deviation & Variation.....	28
*HDT	-	Heading, True.....	28
HSC	-	Heading Steering Command.....	28
LCD	-	Loran-C Signal Data.....	29
MTW	-	Water Temperature.....	29
*MWV	-	Wind Speed and Angle.....	29
OLN	-	Omega Lane Numbers.....	29
*OSD	-	Own Ship Data.....	30
RMA	-	Recommend Minimum Specific Loran-C Data.....	30
RMB	-	Recommend Minimum Navigation Information.....	31
RMC	-	Recommend Minimum Specific GPS/TRANSIT Data.....	31
*ROT	-	Rate of Turn.....	32
*RPM	-	Revolutions.....	32
*RSA	-	Rudder Sensor Angle.....	32
*RSD	-	RADAR System Data.....	32
RTE	-	Routes.....	33
*SFI	-	Scanning Frequency Information.....	33
STN	-	Multiple Data ID.....	34
TRF	-	TRANSIT Fix Data.....	34
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*VBW	-	Dual Ground/Water Speed.....	35
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VHW	-	Water Speed and Heading.....	35
VLW	-	Distance Traveled through the Water.....	36
VPW	-	Speed, Measured Parallel to Wind.....	36
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WPL	-	Waypoint Location.....	36
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XTR	-	Cross-Track Error, Dead Reckoning.....	38
ZDA	-	Time & Date.....	38
ZFO	-	UTC & Time from Origin Waypoint.....	38
ZTG	-	UTC & Time to Destination Waypoint.....	38

AAM - Waypoint Arrival Alarm

Status of arrival (entering the arrival circle, or passing the perpendicular of the course line) at waypoint c--c.

```
$--AAM,A,A,x.x,N,c--c*hh<CR><LF>
| | | | |
| | | | +-----Waypoint ID
| | | +-----Units of radius, nautical miles
| | +-----Arrival circle radius
| +-----Status: A = perpendicular passed at
waypoint
+-----Status: A = arrival circled entered
```

ALM - GPS Almanac Data

Contains GPS week number, satellite health and the complete almanac data for one satellite. Multiple messages may be transmitted, one for each satellite in the GPS constellation, up to maximum of 32 messages.

```
$--ALM,x.x,x.x,xx,x.x,hh,hhhh,...
| | | | | |
| | | | | +-----e, eccentricity [3]
| | | | | +-----SV health, bits 17-24 of each almanac
page [2]
| | | +-----GPS week number [1]
| | +-----Satellite PRN number, 01 to 32
| +-----Message number
+-----Total number of messages
```

```
hh,hhhh,hhhh,hhhhhh,hhhhhh,...
| | | | |
| | | | | +-----Omega, argument of perigee [3]
| | | | | +-----SQRT(A), root of semi-major axis [3]
| | | +-----OMEGADOT, rate of right ascension [3]
| +----- (sigma) index i, inclination angle [3]
+-----t index OA, almanac reference time [3]
```

```
hhhhhh,hhhhhh,hhh,hhh*hh<CR><LF>
| | | | |
| | | | | +-----a index f1, clock parameter [3]
| | | | | +-----a index f0, clock parameter [3]
| | | +-----M index 0, mean anomaly [3]
+----- (OMEGA) index 0, longitude of ascension
node[3]
```

[1] Variable length integer, 4-digits maximum. Converted from (10) most significant binary bits of Subframe 1, Word 3. Reference Table 20-I, ICD-GPS-200, Rev. B.

[2] Reference paragraph 20.3.3.5.1.3, Table 20-VII and Table 20-VIII, ICD-GPS-200, Rev. B.


```

$--BEC,hhmmss.ss,llll.ll,a,...
|           |           |
|           |           +-----\N/S North or South
|           +-----/Waypoint Latitude
+-----UTC of observation

```

```

YYYYY.YY,a,x.x,T,x.x,M,x.x,N,...
|           | | | | | | |
|           | | | | | | +--\nautical miles
|           | | | | | | +-----/Distance
|           | | | | | +-----\degrees Magnetic
|           | | | +-----/Bearing
|           | | +-----\E/W East or West
|           | +-----/Waypoint longitude
|           +-----\N/S North or South
+-----/Waypoint latitude

```

```

c--c*hh<CR><LF>
|
+-----Waypoint ID

```

BOD - Bearing - Origin to Destination

Bearing angle of the line, calculated at the origin waypoint, extending to the destination waypoint from the origin waypoint for the active navigation leg of the journey.

```

$--BOD,x.x,T,x.x,M,c--c,c--c*hh<CR><LF>
| | | | | |
| | | | | +-----Origin waypoint ID
| | | | +-----Destination waypoint ID
| | | +-----\degrees Magnetic
| | +-----/Bearing
| +-----\degrees True
+-----/Bearing

```

BWC - Bearing & Distance to Waypoint - Great Circle

BWR - Bearing & Distance to Waypoint - Rhumb Line

Time (UTC) and distance & bearing to, and location of, a specified waypoint from present position. '\$--BWR' data is calculated along the rhumb line from present position rather than along the great circle path.

```

$--BWC,hhmmss.ss,llll.ll,a,...
|           |           |
|           |           +-----\N/S North or South
|           +-----/Waypoint latitude
+-----UTC of observation

```

```

YYYYY.YY,a,x.x,T,x.x,M,x.x,N,...
|      | | | | | | |
|      | | | | | | | +--\nautical miles
|      | | | | | | | +-----/Distance
|      | | | | | | | +-----\degrees Magnetic
|      | | | | +-----/Bearing
|      | | +-----\degrees True
|      | +-----/Bearing
|      +-----\E/W East or West
+-----/longitude

```

```

c--c*hh<CR><LF>
|
+-----Waypoint ID

```

```

$--BWR,hhmmss.ss,llll.ll,a,...
|      |      |
|      |      +-----\N/S North or South
|      +-----/Waypoint latitude
+-----UTC of observation

```

```

YYYYY.YY,a,x.x,T,x.x,M,x.x,N,...
|      | | | | | | |
|      | | | | | | | +--\nautical miles
|      | | | | | | | +-----/Distance
|      | | | | | | | +-----\degrees Magnetic
|      | | | | +-----/Bearing
|      | | +-----\degrees True
|      | +-----/Bearing
|      +-----\E/W East or West
+-----/longitude

```

```

c--c*hh<CR><LF>
|
+-----Waypoint ID

```