Navigation: [Home](#) =>[Profil](#)=>[SeaTalk](#)=>Part2
Stand: 29.07.2017

# SeaTalk Technical Reference Part 2:

## Recognized Datagrams (in hexadecimal notation):

```
Com Att Dat Dat...

 00  02  YZ  XX XX   Depth below transducer: XXXX/10 feet
                            Flags in Y: Y&8 = 8: Anchor Alarm is active
                                        Y&4 = 4: Metric display units or
                                                 Fathom display units if followed by command 65
                                        Y&2 = 2: Used, unknown meaning
                            Flags in Z: Z&4 = 4: Transducer defective
                                        Z&2 = 2: Deep Alarm is active
                                        Z&1 = 1: Shallow Depth Alarm is active
                     Corresponding NMEA sentences: DPT, DBT

 01  05  XX XX XX XX XX XX  Equipment ID, sent at power on, reported examples:
 01  05  00 00 00 60 01 00  Course Computer 400G
 01  05  04 BA 20 28 01 00  ST60 Tridata
 01  05  70 99 10 28 01 00  ST60 Log
 01  05  F3 18 00 26 0F 06  ST80 Masterview
 01  05  FA 03 00 30 07 03  ST80 Maxi Display
 01  05  FF FF FF D0 00 00  Smart Controller Remote Control Handset

 05  03  0X  YY ZZ  PP   Engine RPM and PITCH:
                            X = 0: RPM & PITCH
                            X = 1: RPM & PITCH  starboard
                            X = 2: PRM & PITCH  port
                            YY*256+ZZ = RPM Value (signed value, example: YYZZ=0x0110=272
RPM, YYZZ=0xfef0= -272 RPM)
                            PP = % Pitch (signed value -128%...+127%, example 0x03=3%,
0xFD= -3%)

 10  01  XX  YY  Apparent Wind Angle: XXYY/2 degrees right of bow
                 Used for autopilots Vane Mode (WindTrim)
                 Corresponding NMEA sentence: MWV

 11  01  XX  0Y  Apparent Wind Speed: (XX & 0x7F) + Y/10 Knots
                 Units flag: XX&0x80=0    => Display value in Knots
                             XX&0x80=0x80 => Display value in Meter/Second
                 Corresponding NMEA sentence: MWV

 20  01  XX  XX  Speed through water: XXXX/10 Knots
                 Corresponding NMEA sentence: VHW

 21  02  XX  XX  0X  Trip Mileage: XXXXX/100 nautical miles

 22  02  XX  XX  00  Total Mileage: XXXX/10 nautical miles

 23  Z1  XX  YY  Water temperature (ST50): XX deg Celsius, YY deg Fahrenheit
                 Flag Z&4: Sensor defective or not connected (Z=4)
                 Corresponding NMEA sentence: MTW

 24  02  00  00  XX  Display units for Mileage & Speed
                     XX: 00=nm/knots, 06=sm/mph, 86=km/kmh
```

```
25  Z4  XX  YY  UU  VV AW  Total & Trip Log
                          total= (XX+YY*256+Z* 4096)/ 10 [max=104857.5] nautical miles
                          trip = (UU+VV*256+W*65536)/100 [max=10485.75] nautical miles


26  04  XX  XX  YY  YY DE  Speed through water:
                          XXXX/100 Knots, sensor 1, current speed, valid if D&4=4
                          YYYY/100 Knots, average speed (trip/time) if D&8=0
                                    or data from sensor 2 if D&8=8
                          E&1=1: Average speed calulation stopped
                          E&2=2: Display value in MPH
                          Corresponding NMEA sentence: VHW


27  01  XX  XX  Water temperature: (XXXX-100)/10 deg Celsius
                Corresponding NMEA sentence: MTW


30  00  0X      Set lamp Intensity; X=0: L0, X=4: L1, X=8: L2, X=C: L3
                    (only sent once when setting the lamp intensity)


36  00  01      Cancel MOB (Man Over Board) condition


38  X1  YY  yy  Codelock data


50  Z2  XX  YY  YY  LAT position: XX degrees, (YYYY & 0x7FFF)/100 minutes
                    MSB of Y = YYYY & 0x8000 = South if set, North if cleared
                    Z= 0xA or 0x0 (reported for Raystar 120 GPS), meaning
unknown
                          Stable filtered position, for raw data use command
58
                    Corresponding NMEA sentences: RMC, GAA, GLL


51  Z2  XX  YY  YY  LON position: XX degrees, (YYYY & 0x7FFF)/100 minutes
                     MSB of Y = YYYY & 0x8000 = East if set, West if cleared
                     Z= 0xA or 0x0 (reported for Raystar 120 GPS), meaning
unknown
                          Stable filtered position, for raw data use command
58
                    Corresponding NMEA sentences: RMC, GAA, GLL


52  01  XX  XX  Speed over Ground: XXXX/10 Knots
                Corresponding NMEA sentences: RMC, VTG


53  U0  VW      Course over Ground (COG) in degrees:
                The two lower  bits of  U * 90 +
                   the six lower  bits of VW *  2 +
                   the two higher bits of  U /  2 =
                   (U & 0x3) * 90 + (VW & 0x3F) * 2 + (U & 0xC) / 8
                The Magnetic Course may be offset by the Compass Variation (see datagram
99) to get the Course Over Ground (COG).
                Corresponding NMEA sentences: RMC, VTG


54  T1  RS  HH  GMT-time: HH hours,
                          6 MSBits of RST = minutes = (RS & 0xFC) / 4
                          6 LSBits of RST = seconds =  ST & 0x3F
                Corresponding NMEA sentences: RMC, GAA, BWR, BWC


55  X1  YY  yy  TRACK keystroke on GPS unit
                keycodes identical with autopilot (command 86)


56  M1  DD  YY  Date: YY year, M month, DD day in month
                Corresponding NMEA sentence: RMC


57  S0  DD      Sat Info: S number of sats, DD horiz. dillution of position, if S=1 ->
```

```
        DD=0x94
                        Corresponding NMEA sentences: GGA, GSA


 58  Z5  LA XX YY LO QQ RR   LAT/LON
                        LA Degrees LAT, LO Degrees LON
                        minutes LAT = (XX*256+YY) / 1000
                        minutes LON = (QQ*256+RR) / 1000
                        Z&1: South (Z&1 = 0: North)
                        Z&2: East  (Z&2 = 0: West)
                        Raw unfiltered position, for filtered data use commands 50&51
                        Corresponding NMEA sentences: RMC, GAA, GLL


 59  22  SS MM XH  Set Count Down Timer
                        MM=Minutes ( 00..3B ) ( 00 .. 63 Min ), MSB:0 Count up start flag
                        SS=Seconds ( 00..3B ) ( 00 .. 59 Sec )
                        H=Houres  ( 0..9 )   ( 00 .. 09 Houres )
                        X= Counter Mode: 0 Count up and start if MSB of MM set
                                         4 Count down
                                         8 Count down and start
                        ( Example 59 22 3B 3B 49 -> Set Countdown Timer to 9.59:59 )
 59  22  0A 00 80  Sent by ST60 in countdown mode when counted down to 10 Seconds.


 61  03  03 00 00 00  Issued by E-80 multifunction display at initialization


 65  00  02       Select Fathom (feet/3.33) display units for depth display (see command
00)


 66  00  XY       Wind alarm as indicated by flags in XY:
                        X&8 = 8: Apparent Wind angle low
                        X&4 = 4: Apparent Wind angle high
                        X&2 = 2: Apparent Wind speed low
                        X&1 = 1: Apparent Wind speed high
                        Y&8 = 8: True Wind angle low
                        Y&4 = 4: True Wind angle high
                        Y&2 = 2: True Wind speed low
                        Y&1 = 1: True Wind speed high (causes Wind-High-Alarm on ST40 Wind
Instrument)
                        XY  =00: End of wind alarm (only sent once)


 68  X1 01 00   Alarm acknowledgment keystroke (from ST80 Masterview)
 68  X1 03 00   Alarm acknowledgment keystroke (from ST80 Masterview)
 68  41 15 00   Alarm acknowledgment keystroke (from ST40 Wind Instrument)
                     X: 1=Shallow Shallow Water Alarm, 2=Deep Water Alarm, 3=Anchor Alarm
                        4=True Wind High Alarm, 5=True Wind Low Alarm, 6=True Wind Angle high
                        7=True Wind Angle low, 8=Apparent Wind high Alarm, 9=Apparent Wind
low Alarm
                        A=Apparent Wind Angle high, B=Apparent Wind Angle low


 6C  05  XX XX XX XX XX XX Second equipment-ID datagram (follows 01...), reported
examples:
 6C  05  04 BA 20 28 2D 2D ST60 Tridata
 6C  05  05 70 99 10 28 2D ST60 Log
 6C  05  F3 18 00 26 2D 2D ST80 Masterview


 6E  07  00  00 00 00 00 00 00 00 MOB (Man Over Board), (ST80), preceded
                        by a Waypoint 999 command: 82 A5 40 BF 92 6D 24 DB


 70  10  XY       Keystroke on Raymarine A25006 ST60 Maxiview Remote Control
                        X=0 => Single keypress; X=2 => Two keys pressed;
                        X=4 => Single key: Press,hold&release; X=6 => Two keys:
Press,hold&release
                        Y=0 => Key 1 "Depth"; Y=1 => Key 2 "Speed" or Keys 1+2;
                        Y=2 => Key 3 "HDG" or Keys 2+4; Y=3 => Key 4 "Wind" or Keys 1+3;
                        Y=4 => Keys 3+4 "Nav"
```

```
    80  00  0X         Set Lamp Intensity: X=0 off, X=4: 1, X=8: 2, X=C: 3

    81  01  00  00     Sent by course computer during setup when going past USER CAL.
    81  00  00         Sent by course computer immediately after above.

    82  05  XX  xx YY yy ZZ zz   Target waypoint name
                       XX+xx = YY+yy = ZZ+zz = FF (allows error detection)
                       Takes the last 4 chars of name, assumes upper case only
                       Char= ASCII-Char - 0x30
                       XX&0x3F: char1
                       (YY&0xF)*4+(XX&0xC0)/64: char2
                       (ZZ&0x3)*16+(YY&0xF0)/16: char3
                       (ZZ&0xFC)/4: char4
                       Corresponding NMEA sentences: RMB, APB, BWR, BWC

    83  07  XX  00  00  00  00  00  80  00  00  Sent by course computer.
                       XX = 0 after clearing a failure condition, also sent once after power-up.
                       XX = 1 failure, auto release error. Repeated once per second.
                       XX = 8 failure, drive stopped.

    84  U6  VW  XY 0Z 0M RR SS TT  Compass heading  Autopilot course and
                       Rudder position (see also command 9C)
                       Compass heading in degrees:
                         The two lower  bits of  U * 90 +
                         the six lower  bits of VW *  2 +
                         number of bits set in the two higher bits of U =
                         (U & 0x3)* 90 + (VW & 0x3F)* 2 + (U & 0xC ? (U & 0xC == 0xC ? 2 : 1):
0)
                       Turning direction:
                         Most significant bit of U = 1: Increasing heading, Ship turns right
                         Most significant bit of U = 0: Decreasing heading, Ship turns left
                       Autopilot course in degrees:
                         The two higher bits of  V * 90 + XY / 2
                       Z & 0x2 = 0 : Autopilot in Standby-Mode
                       Z & 0x2 = 2 : Autopilot in Auto-Mode
                       Z & 0x4 = 4 : Autopilot in Vane Mode (WindTrim), requires regular "10"
datagrams
                       Z & 0x8 = 8 : Autopilot in Track Mode
                       M: Alarms + audible beeps
                         M & 0x04 = 4 : Off course
                         M & 0x08 = 8 : Wind Shift
                       Rudder position: RR degrees (positive values steer right,
                         negative values steer left. Example: 0xFE = 2° left)
                       SS & 0x01 : when set, turns off heading display on 600R control.
                       SS & 0x02 : always on with 400G
                       SS & 0x08 : displays "NO DATA" on 600R
                       SS & 0x10 : displays "LARGE XTE" on 600R
                       SS & 0x80 : Displays "Auto Rel" on 600R
                       TT : Always 0x08 on 400G computer, always 0x05 on 150(G) computer

    85  X6  XX  VU ZW ZZ YF 00 yf   Navigation to waypoint information
                       Cross Track Error: XXX/100 nautical miles
                        Example: X-track error 2.61nm => 261 dec => 0x105 => X6XX=5_10
                       Bearing to destination: (U & 0x3) * 90° + WV / 2°
                        Example: GPS course 230°=180+50=2*90 + 0x64/2 => VUZW=42_6
                        U&8: U&8 = 8 -> Bearing is true, U&8 = 0 -> Bearing is magnetic
                       Distance to destination: Distance 0-9.99nm: ZZZ/100nm, Y & 1 = 1
                                                Distance >=10.0nm: ZZZ/10 nm, Y & 1 = 0
                       Direction to steer: if Y & 4 = 4 Steer right to correct error
                                           if Y & 4 = 0 Steer left  to correct error
                       Example: Distance = 5.13nm, steer left: 5.13*100 = 513 = 0x201 => ZW ZZ
YF=1_ 20 1_
                                Distance = 51.3nm, steer left: 51.3*10  = 513 = 0x201 => ZW ZZ
YF=1_ 20 0_
                       F contains four flags which indicate the available data fields:
```

```
                             Bit 0 (F & 1): XTE present
                             Bit 1 (F & 2): Bearing to destination present
                             Bit 2 (F & 4): Range to destination present
                             Bit 3 (F & 8): XTE >= 0.3nm
                        These bits are used to allow a correct translation from for
instance an RMB sentence which
                        contains only an XTE value, all other fields are empty. Since
SeaTalk has no special value
                        for a data field to indicate a "not present" state, these flags are
used to indicate the
                        presence of a value.
                    In case of a waypoint change, sentence 85, indicating the new bearing
and distance,
                    should be transmitted prior to sentence 82 (which indicates the
waypoint change).
                    Corresponding NMEA sentences: RMB, APB, BWR, BWC, XTE


86  X1  YY  yy  Keystroke
                X=1: Sent by Z101 remote control to increment/decrement
                  course of autopilot
     11  05  FA    -1
     11  06  F9   -10
     11  07  F8    +1
     11  08  F7   +10
     11  20  DF    +1 &  -1
     11  21  DE    -1 & -10
     11  22  DD    +1 & +10
     11  28  D7   +10 & -10
     11  45  BA    -1        pressed longer than 1 second
     11  46  B9   -10        pressed longer than 1 second
     11  47  B8    +1        pressed longer than 1 second
     11  48  B7   +10        pressed longer than 1 second
     11  60  DF    +1 &  -1  pressed longer than 1 second
     11  61  9E    -1 & -10  pressed longer than 1 second
     11  62  9D    +1 & +10  pressed longer than 1 second
     11  64  9B   +10 & -10  pressed longer than 1 second (why not 11 68 97 ?)


                Sent by autopilot (X=0: ST 1000+,  X=2: ST4000+ or ST600R)
     X1  01  FE    Auto
     X1  02  FD    Standby
     X1  03  FC    Track
     X1  04  FB    disp (in display mode or page in auto chapter = advance)
     X1  05  FA    -1 (in auto mode)
     X1  06  F9   -10 (in auto mode)
     X1  07  F8    +1 (in auto mode)
     X1  08  F7   +10 (in auto mode)
     X1  09  F6    -1 (in resp or rudder gain mode)
     X1  0A  F5    +1 (in resp or rudder gain mode)
     X1  21  DE    -1 & -10 (port tack, doesn´t work on ST600R?)
     X1  22  DD    +1 & +10 (stb tack)
     X1  23  DC    Standby & Auto (wind mode)
     X1  28  D7   +10 & -10 (in auto mode)
     X1  2E  D1    +1 & -1 (Response Display)
     X1  41  BE    Auto pressed longer
     X1  42  BD    Standby pressed longer
     X1  43  BC    Track pressed longer
     X1  44  BB    Disp pressed longer
     X1  45  BA    -1 pressed longer (in auto mode)
     X1  46  B9   -10 pressed longer (in auto mode)
     X1  47  B8    +1 pressed longer (in auto mode)
     X1  48  B7   +10 pressed longer (in auto mode)
     X1  63  9C    Standby & Auto pressed longer (previous wind angle)
     X1  68  97   +10 & -10 pressed longer (in auto mode)
     X1  6E  91    +1 & -1 pressed longer (Rudder Gain Display)
     X1  80  7F    -1 pressed (repeated 1x per second)
```

```
     X1  81  7E      +1 pressed (repeated 1x per second)
     X1  82  7D     -10 pressed (repeated 1x per second)
     X1  83  7C     +10 pressed (repeated 1x per second)
     X1  84  7B      +1, -1, +10 or -10 released

 87  00  0X          Set Response level
                     X=1  Response level 1: Automatic Deadband
                     X=2  Response level 2: Minimum Deadband


 88  03  WW  XX  YY  ZZ  Autopilot Parameter: Sent by AP every
                         second while in parameter setting mode.
                         (User or Dealer Calibration Mode)
                         WW Parameter Number
                         XX Current Setting
                         YY Max Parameter Value
                         ZZ Min Parameter Value
                         Known Paramters: Parameter (min-max) [default]        Number
                         rudder gain  (1-9) [2]                                     1
                         counter rudder (1-9) [2]                                   2
                         rudder limit  (10-40) [30]                                 3
                         turn rate limit  (1-30) [off]                             4
                         speed  (4-60) [8]                                          5
                         off course limit  (15-40) [20]                            6
                         auto trim  (0-4) [1]                                       7
                         power steer [Joy Stick] ON/OFF (not on new 400G)          9
                         drive type  (3,4,5) [3]                                    A
                         rudder damping  (1-9) [2]                                  B
                         variation: (full degrees)(-30 to +30) [0]                 C
                         auto adapt: 0=Off,1=North,2=South [1]                      D
                         auto adapt latitude (0-80) [0]                             E
                         auto release (only for stern drive) ON/OFF                F
                         rudder alignment (-7 to +7) [0]                          10
                         Wind Trim (Wind Response) (1-9) [5] (only for sail)      11
                         Response  (1-9) [5]                                      12
                         Boat type:1=displ,2=semi-displ,3=plan,4=stern,5=work,6=sail 13
                         Cal Lock:  0=OFF, 1=ON [0]                               15
                         Auto Tack Angle (40-125) [100] (only for sail)           1d

 89  U2  VW  XY  2Z  Compass heading sent by ST40 compass instrument
                     (it is read as a compass heading by the ST1000(+) or ST2000(+)
autopilot)
                        Compass heading in degrees:
                          The two lower bits of  U  *  90   +
                          the six lower bits of VW  *   2   +
                          the two higher bits of U  /   2   =
                          (U & 0x3) * 90 + (VW & 0x3F) * 2 + (U & 0xC) / 8
                        Locked stear reference (only send by the ST40 compass):
                          The two higher bits of V * 90 + XY / 2
                        Z & 0x2 = 0 : St40 in Standby mode
                        Z & 0x2 = 2 : St40 in Locked stear mode
                        Corresponding NMEA sentences: HDM, HDG, HDT, VHW

 90  00  XX          Device Indentification
                     XX=02   sent by ST600R ~every 2 secs
                     XX=05   sent by type 150, 150G and 400G course computer
                     XX=A3   sent by NMEA <-> SeaTalk bridge ~every 10 secs

 91  00  0X          Set Rudder gain to X

 92  02  XX  YY  00 Set Autopilot Parameter: Sent by the remote head
                     (e.g. ST600R) to set a particular parameter.
                     XX Parameter Number (see 88)
                     YY Value to set to.
```

```
 93  00  00            Enter AP-Setup: Sent by course computer before
                       finally entering the dealer setup. It is repeated
                       once per second, and times out after ten seconds.
                       While this is being sent, command 86 X1 68 97 is
                       needed for final entry into Setup. (600R generates
                       this when -1 & +1 are pressed simultaneously in this
                       mode).


 95  U6  VW  XY 0Z 00 RR 00 0T  Replaces command 84 while autopilot is in value setting
mode
                       e.g. lamp intensity or response level


 99  00  XX            Compass variation sent by ST40 compass instrument
                         or ST1000, ST2000, ST4000+, E-80 every 10 seconds
                         but only if the variation is set on the instrument
                         Positive XX values: Variation West, Negative XX values: Variation
East
                         Examples (XX => variation): 00 => 0, 01 => -1 west, 02 => -2 west ...
                                                     FF => +1 east, FE => +2 east ...
                       Corresponding NMEA sentences: RMC, HDG


 9A  09  L11  L12  L13  L14  L21  L22  L23  00  00  00  Version String:
                       L11 means line 1 char 1. There are two lines, line 1
                       Can have 4 characters and line two can have 3
                       Characters. Char: "A"= 0x00, "B"= 0x01,……..
                       Char: "0"= 0x25, "1"= 0x26, ……….
                       Some special characters are mapped to the range
                       Between alphas and numeric chars. It seems modulo
                       masked at 0x36, and wraps around from there.


 9C  U1  VW  RR        Compass heading and Rudder position (see also command 84)
                          Compass heading in degrees:
                            The two lower  bits of  U * 90 +
                            the six lower  bits of VW *  2 +
                            number of bits set in the two higher bits of U =
                            (U & 0x3)* 90 + (VW & 0x3F)* 2 + (U & 0xC ? (U & 0xC == 0xC ? 2 :
1): 0)
                          Turning direction:
                            Most significant bit of U = 1: Increasing heading, Ship turns right
                            Most significant bit of U = 0: Decreasing heading, Ship turns left
                          Rudder position: RR degrees (positive values steer right,
                            negative values steer left. Example: 0xFE = 2° left)
                          The rudder angle bar on the ST600R uses this record


 9E  FC  49  49 03 XX AA BB YY OO PP GG HH II JJ   Waypoint definition
                       XX: Degrees LAT, YY: Degrees LON
                       min&sec LAT= AA+(BB&0x1F)*256, BB&0x80 = 0: North, BB&0x80 = 0x80:
South
                       min&sec LON= OO+(PP&ßx1F)*256, PP&0x80 = 0: West,  PP&0x80 = 0x80: East
                       GG HH II JJ: Last four characters of waypoint name


 A1  XD  49  49 GG HH II JJ C1 C2 C3 C4 C5 C6 C7 C8  Destination Waypoint Info
                       GG HH II JJ: Last four characters of waypoint name
                       C1...C8: Up to 8 characters of WP name, unused are 0
                       Longer names (> 8 chars) create an additional record:
                       X=0: single record (short name)
                       X=1: 1st record, more follows
                       X=3: last record
                       Corresponding NMEA sentences: RMB, APB, BWR, BWC


 A2  X4  00  WW XX YY ZZ Arrival Info
                       X&0x2=Arrival perpendicular passed, X&0x4=Arrival circle entered
                       WW,XX,YY,ZZ = Ascii char's of waypoint id.   (0..9,A..Z)
                                     Takes the last 4 chars of name, assumes upper case only
```

```
                             Corresponding NMEA sentences: APB, AAM

 A4  02  00  00 00 Broadcast query to identify all devices on the bus, issued e.g. by C70
plotter
 A4  06  00  00 00 00 00 Termination of request for device identification, sent e.g. by
C70 plotter
 A4  12  II  VV WW Device answers identification request
                        II: Unit ID (01=Depth, 02=Speed, 03=Multi, 04=Tridata, 05=Tridata
repeater,
                                    06=Wind, 07=WMG, 08=Navdata GPS, 09=Maxview,
0A=Steering compas,
                                    0B=Wind Trim, 0C=Speed trim, 0D=Seatalk GPS, 0E=Seatalk
radar ST50,
                                    0F=Rudder angle indicator, 10=ST30 wind, 11=ST30
bidata, 12=ST30 speed,
                                    13=ST30 depth, 14=LCD navcenter, 15=Apelco LCD
chartplotter,
                                    16=Analog speedtrim, 17=Analog depth, 18=ST30 compas,
                                    19=ST50 NMEA bridge, A8=ST80 Masterview)
                        VV: Main Software Version
                        WW: Minor Software Version


 A5                   GPS and DGPS Info
 A5  57  QQ  HH ?? AA GG ZZ YY DD   GPS and DGPS Fix Info
                        Signal Quality= QQ&0xF, QQ&0x10: Signal Quality available flag
                        HDOP= HH&0x7C, HH&0x80: HDOP available flag
                        Antenna Height= AA
                        Number of Sats= (QQ&0xE0)/16+(HH&0x1), HH&0x2: NumSats available flag
                        GeoSeperation= GG*16 (-2048....+2047 meters)
                        Differential age=(ZZ&0xE0)/2+(YY&0xF), YY&0x10: Diff. age available
flag
                        Differential Station ID=(YY&0xC0)*4+DD, YY&0x20: Diff.St.ID available
flag
                        Corresponding NMEA sentences: GGA, RMC, GSV, GLL, GGA
 A5  61  04  E2    , A5 8D ..., A5 98 ..., A5 B5 ..., A5 0C...  Unknown meaning
 A5  74  ID  ID ID ID ID   GPS Info: ID numbers of satelites
 A5  XD  NN  AA EE SS MM BB FF GG OO CC DD XX YY ZZ   GPS Info: Sat Position and Signal
                        Data of up to three satelites [1,2,3] per datagram
                        Satellite number: [1] NN&0xFE, [2] (MM&0x70)/2+(BB&0x7), [3] CC&0x3F
                        Satellite azimuth:[1] AA*2+(EE&0x1), [2] (BB&0xF8)*2+(FF&0xF), [3]
(CC&0xC0)*2+DD&0x7F
                        Satellite elevation:[1] (EE&0xFE)/2, [2] (FF&0xF0)/2+GG&0x7, [3]
XX&0x7F
                        Satellite signal: [1] (SS&0xFE)/2, [2] (GG&0x80)/2+OO&0x3F, [3]
(YY&0xFC)/2+ZZ&0x1

                          It seems that there will be 4 sat info datagrams
                          generated, the first with X=0 carries the
                          position and signal data of the 1st 3 satellites.
                          The second also with X=0, but NN&0x1 set and a
                          length of 0x0C carries the data of the next 2
                          satellites and then the ID numbers of the 1st 4
                          sats. A datagram like the 1st one, but with X=2
                          carries data of 3 more sats [6,7,8]. It was not
                          possible to get more than 8 sats mapped to
                          SeaTalk. Finally a datagram with X=7 carries the
                          next 5 ID numbers.

                        Corresponding NMEA sentences: GSV, GSA

 A7  09  86 000000000000000079 Unknown meaning, sent by Raystar 120 GPS


 A8  53  80 00 00 D3  Alarm ON  for Guard #1 or #2
 A8  43  80 00 00 C3  Alarm OFF for Guard #1 or #2
 AB  53  80 00 00 D3  Alarm ON  for Guard #1 or #2
```

```
AB  43  80 00 00 C3  Alarm OFF for Guard #1 or #2
```

[Return to Top of Page](#)   [Overview](#)  [Part 1](#)     **[Part 3](#)**