SBE SOLO DIAGNOSTIC MESSAGE   (Rev 1.1   20 November, 2000)

Every 13th message transmitted by the SBE SOLO is a diagnostic, containing both discrete samples from the SBE and other engineering parameters. The following describes the 64 character message, where column 'Char'=character placement, with '2,3,4' signifying characters 2, 3 and 4 comprise the 12 bits for parameter P1. The number in the last column refers to the corresponding stage that the datum was taken, as referenced by the outline in the 'Description of the typical SBE SOLO cycle' (p.2).

Char.	Name	Description	
1	id	Diagnostic message identifier = 'F'	
2,3,4	P1	Pressure counts before the start of ascent.	5
5,6,7,8	T1	Temperature counts at same time as P1	5
9,10,11,12	S1	Salinity counts at same time as P1	5
13,14,15,16	P2	Pressure counts taken ~5 s after P1	5
17,18,19,20	T2	Temperature counts at same time as P2	5
21,22,23,24	S2	Salinity counts at same time as P2	5
25,26,27,28	P3	Pressure counts taken ~5 s after P2	5
29,30,31,32	T3	Temperature counts at same time as P3	5
33,34,35,36	S3	Salinity counts at same time as P3	5
37,38	-	'00' : not assigned	
39,40,41	ATE	Air pressure inside of SOLO at end of last surface time	8
42,43,44	ATS	Air pressure inside of SOLO at start of last surface time	8
45,46,47	PFS	Pressure counts at the start of the SOLO Fall time	1
48,49,50	PFE	Pressure counts at the end of the SOLO Fall time	2
51,52,53	PRE	Pressure counts at the end of the SOLO Rise time	5
54,55,56	TSK	TSK*2 = time (s) piston ran during first SEEK cycle	3
57,58,59	PSK	(signed) change in pressure during first SEEK cycle	3
60,61,62	TIP	TIP*2 = new time (s) to run piston in to get to SEEK depth	3
63	BST	4-bit status of miscellaneous operations (see below)	
64	-	'0' : not assigned	

The 4 bits of BST (bit 0 = lsb, bit 3 = msb) are assigned:

bit 3 = Alow = 1 if the air bladder was refilled during the surface transmit time
(not assigned for the first dive cycle, otherwise signifies a potential leaky air valve).

bit 2 = PQUEST = 1 if the pressure counts is questionable at the end of the Fall time, true if P counts puts us deeper than 2000 dBar OR shallower than Ptol, a variable set during final programming. If set, the SOLO does no SEEKing, and pulls the piston all of the way in.

bit 1 = OUT = 1 if the piston OUT limit switch is detected with the SOLO at the surface (normally OUT=1)

bit 0 = IN = 1 if the piston IN limit switch is detected at the start of ascent.
This will depend upon profile direction: if profiling on ascent, then normally IN=1.

Discrete Profiler Note (SOLO 1166, 1168) P3, T3, S3 are not valid in the above message, and their values should be ignored.