Data Formats for Polar Sea Under Way Instruments Science Cruise PSEA1001

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Data

Data are received via RS-232 serial connections. In SCS a time tag is added at the beginning of each line of data in the form,
mm/dd/yyyy,hh:mm:ss.sss,[data stream from instrument] where:

Format	Value used
mm	2 digit month of the year
dd	2 digit day of the month
yyyy	4 digit year
hh	2 digit hour of the day
mm	2 digit minute
ss.sss	seconds

An example string from the Met-Air file is:

03/08/2010,00:00:27.606,$PSATA,1.24,0.517*63
All times are reported in UTC. Each file type has it's own NMEA string name ($PSATA, as an example). The delimiters that separate fields in the raw data files are commas. Care should be taken when reprocessing the data that the field's separations are clearly understood.

Directories and Contents:

raw This directory contains raw data as recorded by individual instruments and put into different directories. Directory names are labeled by the instrument name and string type of the data collected. A description of the data contained in this directory is below.

sat_images Contains all satellite imagery. A description of the data contained in this directory is below.

scs_data This directory contains serial data collected by the SCS version 4.3.6, data is collected into different directories. Directory names are labeled by the instrument name and string type of the data collected. A description of the data contained in this directory is below.

meta_data This directory contains documents useful in the post analysis of the data. The data types are separated into different directories by type. A description of these directories is below.

raw:

/knudsen_raw

KNUDSEN 320B/R

The Knudsen 320B/R depth sounder can record depth in both 3.5 and 12 kHz mode. The Polar Sea records both while underway. This data can be saved in all of the formats that the Knudsen can record data in. These files are in both ASCII and BINARY format (see the table below). This data is also saved as depth in scs_data/sea1001/Knudsen.

FILENAME	FORMAT	DEFINITION
2007_102_0005_004.keb	Binary	Knudsen Playback File
2007_102_0005_008.kea	Ascii	Log of depth, settings and environmental data
2007_102_0005_HF_001.sgy	Binary	SEG-Y extended Seismic format

/ctd CTD data in directories by Cast number.

CTD

Data for the each CTD cast are contained here. These files are in SeaBird software's format. Each cast is in a separately numbered subdirectory. The Names of the files vary by cruise but file extent examples below will be constant. **./ctd**

FILENAME	FORMAT	DEFINITION
021.CON	ASCII	The configuration file for the cast
021.HDR	ASCII	Header information for the cast
021.btl	ASCII	Bottle firing trip file
021.cnv	ASCII	Converted data
021.hex	ASCII	Raw data
021.jpg	Binary	Plotted JPEG image of the cast
021avg.cnv	ASCII	Meaned .5 meter down cast of the data

sat_images:

In the table below is a list of the different satellite products available, along with the naming standards used and file extension.

Product	Naming Standard	Extension
alos	Product, Day, Month, Time	.sid
amsr	Product, Year, Month, Day	.tif
envisat	Product, Day, Month, Time	.sid
modis	Product, Day, Month, Year, Time	.sid
nic_forecast	Product, Year, Month, Day	.jpg
ols	Product, Day, Month, Time	.sid
radarsat	Product, Day, Month, Time	.sid
shapefiles	Product, Year, Month, Day	.zip

scs_data:

File Formats of Data Collected Underway
In the sections below for each data type the directory name is listed, then an example file name, and then 3 lines from that file. This part is followed by a table that lists the data contained in the string.

The following data types are to be found in the scs_data directory:

/adu_gga

Ashtech Global Positoning System Fix Data (GGA)
Position data in NMEA GGA format from the Ashtech ADU5 GPS receiver.

03/08/2010,00:00:00.902,$GPGGA,000017.00,5638.97277,N,15250.02528,W,1,10,0.8,16.69,M,11.57,M,,*41
03/08/2010,00:00:01.918,$GPGGA,000018.00,5638.97053,N,15250.03111,W,1,10,0.8,16.84,M,11.57,M,,*46
03/08/2010,00:00:02.918,$GPGGA,000019.00,5638.96822,N,15250.03712,W,1,10,0.8,17.14,M,11.57,M,,*45

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:00.902	hh:mm:ss.sss
3	NMEA header	$GPGGA	ASCII text
4	GPS time at position GMT	000017.00	hhmmss.ss
5	Latitude	5638.97277	ddmm.mmmmm
6	North (N) or South(S)	N	ASCII character
7	Longitude	15250.02528	dddmm.mmmmm
8	East (E) or West (W)	W	ASCII character
9	GPS Quality: 1 = GPS 2=DGPS	1	ASCII integer
10	Number of GPS Satellites Used	10	ASCII integer
11	HDOP (horizontal dilution of precision)	0.8	
12	Antenna height	16.69	meters
13	M for Meters	M	ASCII character
14	Geoidal Height	11.57	meters
15	M for Meters	M	ASCII character
16	Differential reference station ID (no data in sample string)		
17	Checksum	*41	ASCCII text

/adu_gll

Ashtech Geographic Position - Latitude/Longitude (GLL)
Position data in NMEA GLL format from the Ashtech ADU5 GPS receiver.

03/09/2010,00:00:01.279,$GPGLL,5500.14028,N,15856.50867,W,235958.00,A,A*77
03/09/2010,00:00:02.295,$GPGLL,5500.13737,N,15856.51004,W,235959.00,A,A*74
03/09/2010,00:00:03.280,$GPGLL,5500.13445,N,15856.51155,W,000000.00,A,A*76

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:01.279	hh:mm:ss.sss
3	NMEA header	$GPGLL	ASCII text
4	Latitude	5500.14028	ddmm.mmmmm
5	North (N) or South(S)	N	ASCII character
6	Longitude	15856.50867	dddmm.mmmmm
7	East (E) or West (W)	W	ASCII character
8	GMT of Position	235958.00	hhmmss.ss
9	Status of data (A=valid)	A	ASCII character
10	Mode Indicator (A=autonomous)	A	ASCII character
11	Checksum	*77	ASCII text

/adu_pat

Ashtech Position/Altitude (PAT)
Position/Altitude data in NMEA PAT format from the Ashtech ADU5 GPS receiver.

03/09/2010,00:00:07.312,$GPPAT,000004.00,5500.12244,N,15856.51618,W,00026.31,11.7441,000.49,-000.54,0.0027,0.0281,0*7B
03/09/2010,00:00:08.297,$GPPAT,000005.00,5500.11940,N,15856.51696,W,00025.92,11.6511,000.36,000.98,0.0018,0.0204,0*5B
03/09/2010,00:00:09.297,$GPPAT,000006.00,5500.11636,N,15856.51775,W,00025.47,11.6273,-000.03,002.43,0.0024,0.0594,0*7F

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:07.312	hh:mm:ss.sss
3	NMEA header	$GPPAT	ASCII text
4	GPS time at position GMT	000004.00	hhmmss.ss
5	Latitude	5500.12244	ddmm.mmmmm
6	North (N) or South(S)	N	ASCII character
7	Longitude	15856.51618	dddmm.mmmmm
8	East (E) or West (W)	W	ASCII character
9	Altitude in meters	00026.31	ASCII integer
10	Heading in degrees	11.7441	ASCII integer
11	Pitch in degrees	000.49	ASCII integer
12	Roll in degrees	-000.54	ASCII integer
13	Attitude phase measurement rms error, MRMS (meters)	0.0027	ASCII integer
14	Attitude baseline length rms error, BRMS (meters	0.0281	ASCII integer
15	Attitude reset flag (0:good attitude, 1:rough estimate or bad attitude)	0	ASCII integer
16	Checksum	*7B	ASCII text

Ashtech (VTG)Velocity/Course
Velocity/Course data in NMEA VTG format from the Ashtech ADU5 GPS receiver.

/adu_vtg

03/09/2010,00:00:03.296,$GPVTG,196.65,T,181.84,M,010.95,N,020.27,K,A*20
03/09/2010,00:00:04.296,$GPVTG,194.89,T,180.08,M,011.10,N,020.57,K,A*2E
03/09/2010,00:00:05.296,$GPVTG,192.34,T,177.54,M,011.13,N,020.62,K,A*2A

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:05.296	hh:mm:ss.sss
3	NMEA header	$GPVTG	ASCII text
4	COG (Course Over Ground) in degrees	192.34	hhmmss.ss
5	T for COG with respect to true north	T	ddmm.mmmmm
6	COG, magnetic (not included)	177.54	ASCII character
7	magnetic	M	dddmm.mmmmm
8	SOG (Speed Over Ground)	011.13	ASCII integer
9	N for knots	N	ASCII character
10	SOG (Speed Over Ground);	020.62	ASCII integer
11	K for km/hr	K	ASCII character
12	Mode Indicator A-Autonomous	A	ASCII character
13	Checksum	*2A	ASCII text

Humidity /Air temp (Deg C)
Met sensor located on the mast.

/airrh

03/08/2010,00:00:17.637,$PSRHA,70.94,0.724,1.36,0.517*64
03/08/2010,00:00:19.621,$PSRHA,70.90,0.724,1.36,0.517*60
03/08/2010,00:00:21.637,$PSRHA,70.88,0.724,1.37,0.518*67

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:21.637	hh:mm:ss.sss
3	NMEA header	$PSRHA	ASCII text
4	Humidity %	70.88	ASCII integer
5	Humidity raw value	0.724	ASCII integer
6	Aux Air Temperature (Deg C)	1.37	ASCII integer
7	Aux Air Temperature raw value	0.518	ASCII integer
8	Checksum	*67	ASCII text

Air temp (Deg F),
Derived sensor from data file **/metair.**

/airtempF

03/07/2010,17:36:31.871,$DERIV,24.26,-4.3,
03/07/2010,17:36:32.871,$DERIV,24.26,-4.3,
03/07/2010,17:36:33.871,$DERIV,24.26,-4.3,

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/07/2010	mm/dd/year
2	SCS logged Time GMT	17:36:33.871	hh:mm:ss.sss
3	NMEA header	$DERIV	ASCII text
4	Air Temperature (Deg F)	24.26	ASCII integer
5	Air Temperature (Deg C)	-4.3	ASCII integer

Barometric Pressure (Deg F),
Met sensor located on the mast.

/baro

03/08/2010,00:00:15.637,$PSBPA,987.73,3.163*65
03/08/2010,00:00:17.637,$PSBPA,987.73,3.163*65
03/08/2010,00:00:19.621,$PSBPA,987.73,3.163*65

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:19.621	hh:mm:ss.sss
3	NMEA header	$PSBPA	ASCII text
4	Barometric Pressure (millibars)	987.73	ASCII integer
5	Barometric Pressure raw value	3.163	ASCII integer
6	Checksum	*65	ASCII text

Bathy-2010
Sub Bottom Profiler Depth data via NEMA string format.

/bathy

03/21/2010,00:00:09.019,$SDDBT, 127.3,f, 38.80,M, 21.2,F
03/21/2010,00:00:09.519,$SDDBT, 127.6,f, 38.90,M, 21.3,F
03/21/2010,00:00:10.019,$SDDBT, 127.3,f, 38.80,M, 21.2,F

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/21/2010	mm/dd/year
2	SCS logged Time GMT	00:00:10.019	hh:mm:ss.sss
3	NMEA header	$SDDBT	ASCII text
4	Depth value (feet)	127.3	ASCII integer
5	Feet	f	ASCII character
6	Depth value (Meters)	38.80	ASCII integer
7	Meters	M	ASCII character
8	Depth value (Fathoms)	21.2	ASCII integer
9	Fathoms	F	ASCII character

FLUOROMETER
Located in the Wet Lab (SCUFA).

/FL

03/08/2010,00:00:15.652,$PSFLA,0.020,0.002,0.026,0.003*4F
03/08/2010,00:00:17.652,$PSFLA,0.020,0.002,0.026,0.003*4F
03/08/2010,00:00:19.637,$PSFLA,0.020,0.002,0.026,0.003*4F

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:19.637	hh:mm:ss.sss
3	NMEA header	$PSFLA	ASCII text
4	Fluorometer ug/l	0.020	ASCII integer
5	Fluorometer Raw Volts	0.002	ASCII integer
6	Turbidity NTU (NTU)	0.026	ASCII integer
7	Turbidity Raw Value	0.003	ASCII integer
8	Checksum	*4F	ASCII text

GP32 Global Positioning System Fix Data (GPGGA)
Lat/Long data in NMEA GPGGA format from the Furuno GP-32.

/gp32gga

03/08/2010,00:00:08.293,$GPGGA,000024,5638.9379,N,15250.0901,W,1,7,2.4,29,M,11,M,,*5B
03/08/2010,00:00:09.340,$GPGGA,000025,5638.9356,N,15250.0960,W,1,7,2.2,29,M,11,M,,*56
03/08/2010,00:00:10.199,$GPGGA,000026,5638.9331,N,15250.1020,W,1,7,2.4,29,M,11,M,,*5E

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:10.199	hh:mm:ss.sss
3	NMEA header	$GPGGA	ASCII text
4	UTC of position fix	000026	hhmmss
5	Geographic latitude	5638.9331	ddmm.mmmmm
6	Direction of latitude	N	ASCII character
7	Geographic longitude	15250.1020	dddmm.mmmmm
8	Direction of longitude	W	ASCII character
9	GPS quality indicator (1 = GPS SPS mode, fix valid)	1	ASCII integer
10	Number of satellites in use (00-12)	7	ASCII integer
11	Horizontal DOP	2.4	ASCII integer
12	Antenna height above/below MSL (mean sea level) reference	29	ASCII integer
13	Unit of altitude (meters)	M	ASCII character
14	Geoidal separation	11	ASCII integer
15	Unit of geoidal separation (meters)	M	ASCII character
16	Age of differential GPS data record (no data in sample string)		
17	Checksum	*5E	ASCCII text

GP32 Global Positioning System Fix Data (GPGLL)
Lat/Long data in NMEA GPGLL format from the Furuno GP-32.

/gp32gll

03/08/2010,18:04:35.121,$GPGLL,5541.6929,N,15754.1592,W,180453,A*3F
03/08/2010,18:04:36.152,$GPGLL,5541.6944,N,15754.1628,W,180454,A*31
03/08/2010,18:04:37.199,$GPGLL,5541.6960,N,15754.1662,W,180455,A*38

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	18:04:37.199	hh:mm:ss.sss
3	NMEA header	$GPGLL	ASCII text
4	Geographic latitude	5541.6960	ddmm.mmmmm
5	Direction of latitude (N - North, S - South)	N	ASCII character
6	Geographic longitude	15754.1662	dddmm.mmmmm
7	Direction of longitude	W	ASCII character
8	UTC of position fix	180455	hhmmss.ss
9	A = data valid V = data invalid	A	ASCII character
10	Checksum	*38	ASCCII text

GP32 Recommended Minimum Specific Data (GPRMC)

Minimum Specific Data in NMEA GPRMC format from the Furuno GP-32.

/gp32rmc

03/09/2010,00:00:06.640,$GPRMC,000003,A,5500.0999,N,15856.5139,W,11.0,192.3,090310,15,E*77
03/09/2010,00:00:07.672,$GPRMC,000004,A,5500.0970,N,15856.5151,W,11.0,192.2,090310,15,E*78
03/09/2010,00:00:08.735,$GPRMC,000005,A,5500.0939,N,15856.5159,W,11.0,191.8,090310,15,E*75

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:08.735	hh:mm:ss.sss
3	NMEA header	$GPRMC	ASCII text
4	UTC of position fix	000005	hhmmss
5	A = data valid V = Navigation receiver warning	A	ASCII character
6	Geographic latitude	5500.0939	dddmm.mmmmm
7	Direction of latitude	N	ASCII character
8	Geographic longitude	15856.5159	ddmm.mmmmm
9	Direction of longitude	W	ASCII character
10	Speed over ground knots	11.0	ASCII integer
11	Track made good (heading-degrees)	191.8	ASCII integer
12	Date in ddmmyy format	090310	ASCII integer
13	Magnetic variation -degrees	15	ASCII integer
14	Direction of magnetic variation (E - East, W - West)	E	ASCII character
15	Checksum	*75	ASCCII text

$GPVTG Course Over Ground and Speed Over Ground (GPVTG)

COG and SOG Data in NMEA GPVTG format from the Furuno GP-32.

/gp32vtg

03/09/2010,00:00:11.673,$GPVTG,,T,176.1,M,11.1,N,20.5,K*67
03/09/2010,00:00:12.720,$GPVTG,,T,176.3,M,11.1,N,20.6,K*66
03/09/2010,00:00:13.580,$GPVTG,,T,176.7,M,11.1,N,20.6,K*62

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:13.580	hh:mm:ss.sss
3	NMEA header	$GPVTG	ASCII text
4	Course Over Ground (COG), degrees TRUE (no data in sample string)		
5	T-TRUE	T	ASCII character
6	Course Over Ground (COG), degrees MAGNETIC	176.7	ASCII integer
7	M-MAGNETIC	M	ASCII character
8	Speed Over Ground (SOG), Knots	11.1	ASCII integer
9	N-Knots	N	ASCII character
10	Speed over ground (SOG), km/hr	20.6	ASCII integer
11	K-km/hr	K	ASCII character
12	Checksum	*62	ASCCII text

GP37 Global Positioning System Fix Data (GPGGA)
Lat/Long data in NMEA GPGGA format from the Furuno GP-37.

/gp37gga

03/08/2010,00:00:12.324,$GPGGA,000028,5638.9423,N,15250.1056,W,1,9,2.0,21,M,11,M,,*57
03/08/2010,00:00:13.309,$GPGGA,000029,5638.9399,N,15250.1114,W,1,9,2.0,21,M,11,M,,*57
03/08/2010,00:00:14.324,$GPGGA,000030,5638.9375,N,15250.1169,W,1,9,2.0,21,M,11,M,,*57

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/08/2010	mm/dd/year
2	SCS logged Time GMT	00:00:14.324	hh:mm:ss.sss
3	NMEA header	$GPGGA	ASCII text
4	UTC of position fix	000030	hhmmss
5	Geographic latitude	5638.9375	ddmm.mmmmm
6	Direction of latitude	N	ASCII character
7	Geographic longitude	15250.1169	dddmm.mmmmm
8	Direction of longitude	W	ASCII character
9	GPS quality indicator (1 = GPS SPS mode, fix valid)	1	ASCII integer
10	Number of satellites in use (00-12)	9	ASCII integer
11	Horizontal DOP	2.0	ASCII integer
12	Antenna height above/below MSL (mean sea level) reference	21	ASCII integer
13	Unit of altitude (meters)	M	ASCII character
14	Geoidal separation	11	ASCII integer
15	Unit of geoidal separation (meters)	M	ASCII character
16	Age of differential GPS data record (no data in sample string)		
17	Checksum	*57	ASCCII text

GP37 Global Positioning System Fix Data (GPGLL)
Lat/Long data in NMEA GPGLL format from the Furuno GP-37.

/gp37gll

03/09/2010,05:03:25.255,$GPGLL,5424.8027,N,16042.5407,W,050317,A*35
03/09/2010,05:03:26.255,$GPGLL,5424.8016,N,16042.5464,W,050318,A*3D
03/09/2010,05:03:27.256,$GPGLL,5424.8007,N,16042.5520,W,050319,A*3D

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	05:03:27.256	hh:mm:ss.sss
3	NMEA header	$GPGLL	ASCII text
4	Geographic latitude	5424.8007	ddmm.mmmmm
5	Direction of latitude (N - North, S - South)	N	ASCII character
6	Geographic longitude	16042.5520	dddmm.mmmmm
7	Direction of longitude	W	ASCII character
8	UTC of position fix	050319	hhmmss.ss
9	A = data valid V = data invalid	A	ASCII character
10	Checksum	*3D	ASCCII text

GP37 Recommended Minimum Specific Data (GPRMC)
Minimum Specific Data in NMEA GPRMC format from the Furuno GP-37.

/gp37rmc

03/09/2010,05:00:43.146,$GPRMC,050035,V,5533.3048,N,15734.0726,W,0.0,0.0,090310,15,E*59
03/09/2010,05:00:44.146,$GPRMC,050036,V,5533.3048,N,15734.0726,W,0.0,0.0,090310,15,E*5A
03/09/2010,05:00:45.146,$GPRMC,050037,V,5533.3048,N,15734.0726,W,0.0,0.0,090310,15,E*5B

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	05:00:45.146	hh:mm:ss.sss
3	NMEA header	$GPRMC	ASCII text
4	UTC of position fix	050037	hhmmss
5	A = data valid V = Navigation receiver warning	V	ASCII character
6	Geographic latitude	5533.3048	dddmm.mmmmm
7	Direction of latitude	N	ASCII character
8	Geographic longitude	15734.0726	ddmm.mmmmm
9	Direction of longitude	W	ASCII character
10	Speed over ground knots	0.0	ASCII integer
11	Track made good (heading-degrees)	0.0	ASCII integer
12	Date in ddmmyy format	090310	ASCII integer
13	Magnetic variation -degrees	15	ASCII integer
14	Direction of magnetic variation (E - East, W - West)	E	ASCII character
15	Checksum	*5B	ASCCII text

$GPVTG Course Over Ground and Speed Over Ground (GPVTG)
COG and SOG Data in NMEA GPVTG format from the Furuno GP-37.

/gp37vtg

03/25/2010,17:14:51.785,$GPVTG,,T,317.8,M,5.5,N,10.2,K*5E
03/25/2010,17:14:52.644,$GPVTG,,T,317.8,M,5.5,N,10.2,K*5E
03/25/2010,17:14:53.675,$GPVTG,,T,317.9,M,5.5,N,10.2,K*5F

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/25/2010	mm/dd/year
2	SCS logged Time GMT	17:14:53.675	hh:mm:ss.sss
3	NMEA header	$GPVTG	ASCII text
4	Course Over Ground (COG), degrees TRUE (no data in sample string)		
5	T-TRUE	T	ASCII character
6	Course Over Ground (COG), degrees MAGNETIC	317.9	ASCII integer
7	M-MAGNETIC	M	ASCII character
8	Speed Over Ground (SOG), Knots	5.5	ASCII integer
9	N-Knots	N	ASCII character
10	Speed over ground (SOG), km/hr	10.2	ASCII integer
11	K-km/hr	K	ASCII character
12	Checksum	*5F	ASCCII text

Gyro Gyro Heading Sperry MK39 Gyro
Heading data in NMEA HDT format from the Sperry MK39 gyrocompass.

/gyro

03/14/2010,00:00:07.784,$HEHDT,324.2,T
03/14/2010,00:00:07.909,$HEHDT,324.2,T
03/14/2010,00:00:08.034,$HEHDT,324.2,T

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/14/2010	mm/dd/year
2	SCS logged Time GMT	00:00:08.034	hh:mm:ss.sss
3	NMEA header	$HEHDT	ASCII text
4	Heading	324.2	ASCII integer
5	True (T) or Magnetic (M	T	ASCII character

Knudsen
Sub Bottom Profiler Depth data via NEMA string format.

/knudsen

03/17/2010,00:00:05.879,$PKEL99,16032010,235944.577,HF,00.00,00.00,00.00,
000,0,+010.00,LF,61.43,71.43,71.43,-125,1,+010.00,1500,62 45.841299N,173 26.992292W*0C
03/17/2010,00:00:07.082,$PKEL99,16032010,235945.777,HF,00.00,00.00,00.00,
000,0,+010.00,LF,61.42,71.42,71.42,-125,1,+010.00,1500,62 45.841400N,173 26.992793W*0C
03/17/2010,00:00:08.285,$PKEL99,16032010,235946.977,HF,00.00,00.00,00.00,
000,0,+010.00,LF,61.44,71.44,71.44,-125,1,+010.00,1500,62 45.841498N,173 26.992993W*08

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/17/2010	mm/dd/year
2	SCS logged Time GMT	00:00:08.285	hh:mm:ss.sss
3	NMEA header	$PKEL99	ASCII text
4	Record Number (NA)		
5	Knudsen Date	16032010	DDMMYYYY
6	Knudsen Time	235946.977	HHMMSS.sss
7	HF Header (12 kHz)	HF	ASCII text
8	Depth to transducer (Meters)	00.00	ASCII integer
9	Depth corrected for depth (Meters)	00.00	ASCII integer
10	Depth corrected for depth (Meters)	00.00	ASCII integer
11	Corrected for draft heave and tide (Meters)	000	ASCII integer
12	Corrected for draft heave and tide (NA)	0	ASCII integer
13	HF Draft Offset	+010.00	ASCII integer
14	LF Header (3.5KHz)	LF	ASCII character
15	Depth to transducer (Meters)	61.44	ASCII integer
16	Depth corrected for depth (Meters)	71.44	ASCII integer
17	Corrected for draft and heave (Meters)	71.44	ASCII integer
18	Corrected for draft heave and tide (NA)	-125	ASCII integer
19	Depth Valid Flag	1	ASCII integer
20	LF Draft	+010.00	ASCII integer
21	Speed of Sound	1500	ASCII integer
22	Latitude	62 45.841498N	ASCII integer
23	Longitude	173 26.992993W	ASCII integer
24	Checksum	*08	ASCII text

Air Temperature Met
Located on the mast.

/metair

03/14/2010,00:00:11.316,$PSATA,-21.73,0.292*74
03/14/2010,00:00:13.378,$PSATA,-21.74,0.291*70
03/14/2010,00:00:15.425,$PSATA,-21.75,0.291*71

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/14/2010	mm/dd/year
2	SCS logged Time GMT	00:00:15.425	hh:mm:ss.sss
3	NMEA header	$PSATA	ASCII text
4	Air Temperature (Deg C)	-21.75	ASCII integer
5	Air Temperature Raw Value	0.291	ASCII integer
6	Checksum	*71	ASCII text

Wind Sensors
Ultrasonic Anemometer located on the mast.

/metwind

03/16/2010,00:00:22.014,$PSWDA,355.44,18.09,93.47,16.24*6A
03/16/2010,00:00:23.389,$PSWDA,355.28,18.21,93.35,16.36*6C
03/16/2010,00:00:25.890,$PSWDA,354.94,18.46,93.17,16.59*62

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/16/2010	mm/dd/year
2	SCS logged Time GMT	00:00:25.890	hh:mm:ss.sss
3	NMEA header	$PSWDA	ASCII text
4	Relative Wind Direction (deg)	354.94	ASCII integer
5	Relative Wind Speed (m/s	18.46	ASCII integer
6	True Wind Direction (deg	93.17	ASCII integer
7	True Wind Speed (m/s)	16.59	ASCII integer
8	Checksum	*62	ASCII text

Flowmeter
Wet Lab Fluorometer/Oxygen water.

/oxyflowmeter

03/09/2010,00:00:20.472,$PSFMB,1.90,35.000*44
03/09/2010,00:00:22.223,$PSFMB,1.90,35.000*44
03/09/2010,00:00:24.208,$PSFMB,1.96,36.000*41

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:24.208	hh:mm:ss.sss
3	NMEA header	$PSFMB	ASCII text
4	FlowMeter LPM LitersPerMinute	1.96	ASCII integer
5	FlowMeter Raw Frequency	36.000	ASCII integer
6	Checksum	*41	ASCII text

Oxygen Sensor
Located in the Wet Lab (SBE-43).

/oxy

03/10/2010,00:00:27.878,$PSOXA,,2.582,,*76
03/10/2010,00:00:30.019,$PSOXA,,2.582,,*76
03/10/2010,00:00:31.675,$PSOXA,,2.582,,*76

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/10/2010	mm/dd/year
2	SCS logged Time GMT	,00:00:31.675	hh:mm:ss.sss
3	NMEA header	,$PSOXA	ASCII text
4	Oxygen ml/l Computed with Salinity value from the thermosalinograph (no data in sample string)		ASCII integer
5	Oxygen Raw Value	2.582	ASCII integer
6	Oxygen Temperature Deg C (no data in sample string)		ASCII integer
7	Oxygen Temperature Raw Volts (no data in sample string)		ASCII integer
8	Checksum	*76	ASCII text

Surface Par Sensor
Located stbd on the Flying Bridge.

/par

03/09/2010,00:00:40.228,$PSSPA,2000.76,1.208*49
03/09/2010,00:00:41.994,$PSSPA,2000.76,1.208*49
03/09/2010,00:00:44.229,$PSSPA,2000.76,1.208*49

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/09/2010	mm/dd/year
2	SCS logged Time GMT	00:00:44.229	hh:mm:ss.sss
3	NMEA header	$PSSPA	ASCII text
4	Surface PAR uE/Sec/M^2	2000.76	ASCII integer
5	Surface PAR Raw Volts	1.208	ASCII integer
6	Checksum	*49	ASCII text

Surface Seawater Temp
Hull Intake.

/ST

03/11/2010,23:11:13.175,$PSSTA,2.790,2994.250*78
03/11/2010,23:11:14.831,$PSSTA,2.865,2999.352*73
03/11/2010,23:11:17.206,$PSSTA,2.865,2999.352*73

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/11/2010	mm/dd/year
2	SCS logged Time GMT	23:11:17.206	hh:mm:ss.sss
3	NMEA header	$PSSTA	ASCII text
4	Sea Surface Water Temperature (Deg C)	2.865	ASCII integer
5	Sea Surface Water Temperature Raw Value	2999.352	ASCII integer
6	Checksum	*73	ASCII text

Thermosalinograph
Located in the Wet Lab (SBE-21).

/tsg

03/16/2010,00:00:36.251,$PSTSA,17.287,-0.0001,0.009,1473.75*68
03/16/2010,00:00:37.611,$PSTSA,17.287,-0.0001,0.009,1473.75*68
03/16/2010,00:00:40.158,$PSTSA,17.287,-0.0001,0.009,1473.75*68

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/16/2010	mm/dd/year
2	SCS logged Time GMT	00:00:40.158	hh:mm:ss.sss
3	NMEA header	$PSTSA	ASCII text
4	Thermosalinograph Water Temperature (Deg C)	17.287	ASCII integer
5	Thermosalinograph Water Conductivity (mS/cm) millisiemens/centimeter	-0.0001	ASCII integer
6	Thermosalinograph Water Salinity (PSU)	0.009	ASCII integer
7	Thermosalinograph Sound Velocity (m/s)	1473.75	ASCII integer
8	Checksum	*68	ASCII text

Flowmeter
Wet Lab TSG water.

/tsgflometer

03/16/2010,05:16:15.359,$PSFMA,19.15,36.000*70
03/16/2010,05:16:16.766,$PSFMA,19.15,36.000*70
03/16/2010,05:16:19.344,$PSFMA,19.15,36.000*70

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/16/2010	mm/dd/year
2	SCS logged Time GMT	,05:16:19.344	hh:mm:ss.sss
3	NMEA header	,$PSFMA	ASCII text
4	FlowMeter LPM (LitersPerMinute)	,19.15	ASCII integer
5	FlowMeter Raw Frequency	,36.000	ASCII integer
6	Checksum	*70	ASCII text

Winch data
1 second data from the Aft Winch.

/winchaft

```
03/18/2010,20:56:23.707,01,   570, ,  -61.3, ,    28, ,0000
03/18/2010,20:56:24.691,01,   610, ,  -60.7, ,    32, ,0000
03/18/2010,20:56:25.675,01,   600, ,  -60.1, ,    34, ,0000
```

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/18/2010	mm/dd/year
2	SCS logged Time GMT	20:56:25.675	hh:mm:ss.sss
3	Winch number	01	ASCII integer
4	Wire tension (Pounds)	600	ASCII integer
5	Wire out (Meters)	-60.1	ASCII integer
6	Wire speed (Meters/minute)	34	ASCII integer

Winch data
1 second data from the Port Winch.

/winchport

03/18/2010,03:36:23.972,01, 50, , 6.0, , -53.5, ,0000
03/18/2010,03:36:24.957,01, 50, , 5.2, , -53.6, ,0000
03/18/2010,03:36:25.941,01, 40, , 4.4, , -53.5, ,0000

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/18/2010	mm/dd/year
2	SCS logged Time GMT	03:36:25.941	hh:mm:ss.sss
3	Winch number	01	ASCII integer
4	Wire tension (Pounds)	40	ASCII integer
5	Wire out (Meters)	4.4	ASCII integer
6	Wire speed (Meters/minute)	-53.5	ASCII integer

Computed Air Temp
Computed from the Met Air Sensor located on the Mast.

/windchill

03/26/2010,00:00:38.222,$PSWCA,-6.73,19.88,-10.69,12.76*60
03/26/2010,00:00:40.113,$PSWCA,-6.73,19.88,-10.66,12.81*67
03/26/2010,00:00:42.535,$PSWCA,-6.73,19.88,-10.62,12.88*6A

FIELD	DATA	Example	UNITS
1	SCS logged Date	03/26/2010	mm/dd/year
2	SCS logged Time GMT	00:00:42.535	hh:mm:ss.sss
3	NMEA header	$PSWCA	ASCII text
4	Air Temperature (deg C)	-6.73	ASCII integer
5	Air Temperature (deg F)	19.88	ASCII integer
6	Air Temp Wind Chill (deg C)	-10.62	ASCII integer
7	Air Temp Wind Chill (deg F)	12.88	
	Checksum	*6A	ASCII text

SAMOS (Shipboard Automated Meteorological and Oceanographic Systems)

/samos_data

Data formatted to be sent to the U.S. Research Vessel Surface Meteorology Data Assembly Center (DAC). These data are in files that have only a single value. Every variable sent into SAMOS is in a separate file. The name of the file should tell the user what the variable is. There are two types of formats used. The bulk of the data has the date, time, a NMEA header for derived data, the mean data for the minute, the last value used in the minute, the total of all the values for the minute and the number of values used to get the mean. The other is for data that is in degrees. The data for degrees has the date, time, a NMEA header for derived data, the mean data for the minute found using the arc tangent of the sine and cosine of the data, the last data value for the minute, the mean of the sums of the sin of the data, the mean of the sum of the cosines of the data and the number of values used to get the mean. A list of all the designators and their corresponding meaning can be found below.

Parameter	Designator for SAMOS
Latitude	LA
Longitude	LO
Speed over Ground	SP
Latitude	LA1
Longitude	LO1
Course over ground	CR
Course over ground	CR1
Speed over ground	SP1
Heading	GY
Depth to Surface	BT
Depth to Surface	BT1
Wind – relative dir	WD
Wind – true dir	TI
Wind – relative speed	WS
Wind – true speed	TS
Wind – true dir	TI1
Wind – true speed	TS1
Wind – relative speed	WS1
Wind – relative dir	WD1
Air temperature	AT
Barometric pressure	BP
Relative humidity	RH
Salinity	SA
Conductivity	TC
TSG Temperature	TT
Sea Surface Temp	ST
Fluorometer	FL
Oxygen	OX
TSG flowmeter	FI
OXY flowmeter	FI1
Surface PAR	PA

Extra files in the directory SCS_Data:

Acq.LOG
Contains the data as to what occurred with SCS data. It shows when data collection was started and stopped.

CallSign EventData

Incidents_YYYYMMDD-TTTTTT.DTM
Contains any incident data which were triggered in SCS 4.3.6.

NOAA_Data sensor_YYYYMMDD-TTTTTT.scf
Files of data sent to NOAA such as relative wind speed, air temperature, true wind speed, wind direction, barometric pressure, relative humidity, and sea surface temperature.

/shipwind
No data was recorded in this folder for PSEA1001

meta_data:

/elogs

Contains the technician's narrative of important events, which occurred both to the network and to individual sensors.

/Bridge_Logs
The "smooth log" containing events recorded by the bridge watch in a DDMMMYY .doc format.

The “Weather log” recorded by the watch in a DDMMMYYWX.xls format.