WCB acoustic survey cruise report JR129 + CPR operations
19/11/2005 – 22/11/2005
Sophie Fielding

Ships compliment
Scientific Personnel: Sophie Fielding, Mark Preston, Jeremy Robst, Alex Tate
Ships officers and crew:

C.R. Elliott	Master
R.C. Paterson	Chief Officer
C. Hunter	2nd Officer
D. Leask	3rd Officer
S.D. Evans	Deck Cadet
K. Giles	Eng Cadet
C.A. Waddicor	ETO (Comms)
D.J. Cutting	Chief Engineer
G.J Armour	2nd Engineer
T.R. Elliott	3rd Engineer
S.J. Eadie	4th Engineer
S.A. Wright	Deck Engineer
N.J. Dunbar	ETO (Eng)
J.S. Gibson	Purser
G.M. Stewart	Bosun
M.A. Blaby	Bosun's Mate
D.G Jenkins	SG1
L. Jolly	SG1
C. Solly	SG1
J. Macleod	SG1
C. Mullaney	SG1
M.A. Robinshaw	MG1
A.I. Mackaskill	MG1
D.M. Macintyre	Chief Cook
M.E. Gomez-Zapata	Steward
C.R. Pratley	Sr Steward
J. Newall	Steward
K. Weston	Steward
D. Lee	Steward

General:
The Western Core Box (WCB) acoustic survey was run in the normal west to east direction. Weather constrictions, determined at ~08:00 GMT on the 19/11/05, at Bird Island resulted in the decision to run the WCB starting late. Because of time constraints it was decided to commence the WCB at the southwest end of W1.2 and work eastwards omitting W1.1. During the night 4 of the 5 CTD stations were undertaken along W1.2. The last CTD was cancelled due to weather and gantry issues. On 20/11/2005 W2.1 was also omitted due to bad weather and the days acoustic transects started with W2.2 which was run at a variable speed due to heavy swell. No CTDs were undertaken along W2.2 as a result of heavy swell and gantry complications. Day three (21/11/2005) was the good day! Both transects 3.1 and 3.2 were run with moderate sea conditions resulting in the transect running at the set speed of 10 knots, all XBTs were deployed successfully. The CTD transect returning

along 3.2 was complicated by CTD problems (first and second CTD) and finally operations were stopped due to bad weather, resulting in only 2 of the deep CTDs being undertaken. The start of the acoustic transects were delayed on day 4 (22/11/2005) due to a heavy swell. Transect 4.1 was finally started at 12:13 GMT, with heavy rolling throughout transect 4.1 and 4.2. XBTs were initially deployed at 7 knots until the third XBT when there was heavy rolling when slowing down. After that (XBT.0010), it was decided to deploy XBTs at 10 knots allowing the ship to be more stable, otherwise they were typically deployed at 7 knots. Throughout the survey sunrise was 06:15 GMT and sunset was 22:15.
Transect W1.2 was undertaken south to north
Transect W2.2 was undertaken south to north
Transect W3.1 was undertaken north to south
Transect W3.2 was undertaken south to north
Transect W4.1 was undertaken south to north
Transect W4.2 was undertaken north to south

Scientific and Bridge logs are available as CSV files, as well as on the JCR intranet.

EK60 settings and operation:
Software versions, hardware
Simrad ER60 v 2.0.0
Sonardata Echolog 60 v 3.10.15
Sonardata Echoview v 3.25.02 – live viewing
Sonardata Echoview v 3.40.47.1551

HASP Dongle BAS1, licensed for base, bathymetry, analysis export, school detection module, virtual echogram module and live viewing, was used to process the data.

The echosounder pc AP10 and the EK60 workstation 2 are integrated into the ship's LAN. ER60 .raw data files were logged to a Sun workstation jrua, using a Samba connection, which is backed up at regular intervals. Echolog was run on workstation 2 and the compressed files stored locally to improve speed of loading data into Echoview.

The EK60 was run with a range set in the EK60 programme of 300 m , all other settings are listed in Table 1. The EK60, echoview and echolog software all ran without crashing throughout the cruise.

Modes of running the echosounders together.
During the transit from Falklands to Stanley, the EM, ADCP, EA and EK were run concurrently, utilising the SSU to control the external triggering. This resulted in a varied ping rate for the EK60: in shallow water the ping rate was fast; in deep water the ping rate was down to once every 25 seconds.

WCB ping settings.
Transect W1.2 – EM and ADCP off, EK60 on internal trigger (setting the interval setting) of 2 seconds, EA ping rate 20 seconds on external trigger controlled by SSU.
Transect W2.2, W3.1, W3.2, W4.1 and W4.2 – EM and ADCP off, EK60 on external trigger (controlled by the SSU) with timed setting of 800ms, EA on passive or active with external timed trigger set to 1200ms – giving a total EK60 ping rate of 2

seconds. It is very important to set the EK60 operations option of ping rate to maximum during this time, otherwise the EK60 indicates errors in unable to achieve ping rate.

For future reference, the ping interval is the most important consideration in the WCB acoustics, then minimising interference

Note: it is not obvious that the 20 second EA setting run in W1.2 caused anymore interference than the settings run on all the other legs, it was just that the operator finally understood how to set up the SSU! On several occasions (listed in the WCB log) the EA was run on passive mode, however this did not prevent the interference that occurs on the shelf in the 120 kHz.

Compression with Echolog
Final compression settings used in Echolog for all frequencies:

1) Power data only (angle data is still available from the raw files)
2) From 0m to 9999m (however only 0-300 being saved in the .raw files so this not important in this case).
3) Average samples where both Sv below -100 and TS below -20
4) Maximum number of samples to average: 50
5) DO NOT use average samples below sounder detected bottom unless sure of bottom detection.

Data processing
Data was processed following the method outlined in Peter Enderlein's JCR manual and using a WCB template now on workstation 2. The main procedures were:

1) Mark bad data – start and end, interference, dropout, false bottom missed pings
2) Review surface noise depth and integration stop – bottom or 250 m
3) Dropout threshold identified
4) Krill and fish masks created

CTD operations:
The CTD was deployed at 6 stations (a total of 8 casts). Four of five CTD stations were undertaken along transect W1.2 working south to north. No CTDs were undertaken along transect 2.2 due to bad weather and two of five CTDs were achieved before bad weather halted them along transect W3.2. CTD stations are listed in table 2. Bottle firing depths are detailed in Table 3.

Problems:
EK60
Prior to running the WCB the EK60 was turned on running from Stanley to Signy. During this time the 38 kHz produced noise whenever used, except for brief periods when on the shelf at Signy. However on turning the EK60 on again on the shelf off South Georgia, the 38 kHz was still mostly noise. Mark Preston replaced the 38 kHz GPT with a spare (old GPT serial number 00907203400b to new GPT serial number 009072033fa5), and a clean 38 kHz echogram immediately resulted. This GPT was used throughout the WCB survey. In addition the door of the GPT cabinet was removed to prevent overheating of the GPTs. On the return transit from South Georgia to Stanley the old GPT was put back into the EK60 and left running with the

door open again to investigate whether it was temperature of the GPTs that was causing problems. The GPT behaved in a correct fashion for the rest of the cruise.

CTD

During the survey the CTD system worked without problems until the 5th CTD cast. The deck engineer noticed that an error alarm had occurred very briefly at the beginning of the cast, although the downcast component appeared to occur without hitch. Once at the bottom depth of 1000 m communication was lost and bottle firing was not occurring normally. It was decided to reboot the CTD software (creating 2 CTD data files for the fifth cast), this reinstated communications and the CTD cast was completed. During the 7th CTD cast it was immediately apparent that there was a communication/wire error. The CTD was aborted at 100 m and returned to the surface and on deck to investigate the source of error. It was found to be the main comms cable (part no: 17120) from the CTD to the swivel that was affecting communications. This was subsequently replaced and a successful CTD was completed afterwards (the 8th and final CTD). Weather was the most limiting factor on the number of CTDs completed, combined with a fault in the ships gantry moveable arm. This fault prevented the moveable arm from being retracted to steady the CTD when being retrieved during rough weather, hence limiting the conditions in which the CTD could be deployed. Water was collected for salinity analysis at deep CTD stations only, on the advice of Sally Thorpe who undertakes the CTD processing at BAS Cambridge. The salinity samples were analysed by Alex Tate.

XBT

During the survey the XBT system worked very well. It was cleaned once during transect 4.1 where one XBT failed and it appeared to be a communication problem between the computer and the XBT, and not a failure of the XBT itself. The only other failure was operator error where this was examined and another XBT (xbt.0000 14) deployed 20 minutes later after no mechanical or communication faults could be found.

Oceanlogger

The oceanlogger worked successfully during all the transects except the start of transect 3.1 where an air block had reduced flow.

Continuous Plankton Recorder (CPR) operations

The CPR was deployed for two 400 mile transects on the return trip from South Georgia to Stanley, Falkland Islands. The first tow (163/0) was deployed 10 miles after leaving KEP just after transit through ice. Tow 163/0 was recovered after 389 nmiles. A quick turn around (thanks to the Deck Engineer) resulted in the second tow (163/1) commencing 10 minutes later (Table

Table 1: EK60 settings during JR129

Ping Mode	Ext Trig (except W1.2)
Ping Interval	Maximum (except W1.2 where was 2 seconds
Salinity	30.4
Temperature	3.1
Sound Velocity	1456.9

Transceiver-1 Menu/Mode	Active
Transceiver-1 Menu/Transducer Type	ES38
Transceiver-1 Menu/Transducer Depth	0.00 m
Transceiver-1 Menu/Absorption Coef.	9.16
Transceiver-1 Menu/Pulse Length	1.024ms
Transceiver-1 Menu/sample interval	0.1865 m (=256µs)
Transceiver-1 Menu/Bandwidth	2425Hz
Transceiver-1 Menu/Max. Power	2000 W
Transceiver-1 Menu/2-Way Beam Angle	-20.70 dB
Transceiver-1 Menu/Sv Transd. Gain	24.16 dB
Transceiver-1 Menu/Sa correction	-0.74 dB
Transceiver-1 Menu/Angle Sens.Along	22.00
Transceiver-1 Menu/Angle Sens.Athw.	22.00
Transceiver-1 Menu/3 dB Beamw.Along	6.95°
Transceiver-1 Menu/3 dB Beamw.Athw.	6.97°
Transceiver-1 Menu/Alongship Offset	-0.17°
Transceiver-1 Menu/Athw.ship Offset	0°
Transceiver-1 Menu/Frequency	38 kHz

Transceiver-2 Menu/Mode	Active
Transceiver-2 Menu/Transducer Type	ES120-7
Transceiver-2 Menu/Transducer Depth	0.00 m
Transceiver-2 Menu/Absorption Coef.	26.24
Transceiver-2 Menu/Pulse Length	1.024ms
Transceiver-2 Menu/sample interval	0.1865m (=256µs)
Transceiver-2 Menu/Bandwidth	3026 Hz
Transceiver-2 Menu/Max. Power	1000 W
Transceiver-2 Menu/2-Way Beam Angle	-20.70 dB
Transceiver-2 Menu/Sv Transd. Gain	22.31 dB
Transceiver-2 Menu/Sa correction	-0.41
Transceiver-2 Menu/Angle Sens.Along	21.00
Transceiver-2 Menu/Angle Sens.Athw.	21.00
Transceiver-2 Menu/3 dB Beamw.Along	7.38°
Transceiver-2 Menu/3 dB Beamw.Athw.	7.36°
Transceiver-2 Menu/Alongship Offset	-0.07°
Transceiver-2 Menu/Athw.ship Offset	-0.20°
Transceiver-2 Menu/Frequency	120 kHz

Transceiver-3 Menu/Mode	Active
Transceiver-3 Menu/Transducer Type	ES200-7
Transceiver-3 Menu/Transducer Depth	0.00 m
Transceiver-3 Menu/Absorption Coef.	39.13
Transceiver-3 Menu/Pulse Length	1.024ms
Transceiver-3 Menu/sample interval	0.1865 m (=256µs)
Transceiver-3 Menu/Bandwidth	3088 Hz
Transceiver-3 Menu/Max. Power	400 W
Transceiver-3 Menu/2-Way Beam Angle	-19.60 dB
Transceiver-3 Menu/Sv Transd. Gain	23.79 dB
Transceiver-2 Menu/Sa correction	-0.32 dB
Transceiver-3 Menu/Angle Sens.Along	23.00
Transceiver-3 Menu/Angle Sens.Athw.	23.00

Transceiver-3 Menu/3 dB Beamw.Along	6.66°
Transceiver-3 Menu/3 dB Beamw.Athw.	6.83°
Transceiver-3 Menu/Alongship Offset	-0.22°
Transceiver-3 Menu/Athw.ship Offset	-0.11°
Transceiver-3 Menu/Frequency	200 kHz

Table 2 CTD positions and files

CTD transect	File name	Date	Time start	Latitude	Longitude	Remarks
W1.2.1	129_001	19/11/2005	18:12	53 18.86	39 18.43	
W1.2.2	129_002	19/11/2005	20:21	53 29.59	39 15.09	
W1.2.3	129_003	19/11/2005	22:27	53 40.22	39 11.83	
W1.2.4	129_004	20/11/2005	00:53	53 50.85	39 08.67	
W3.2.5	129_005	21/11/2005	18:33	53 10.75	38 08.68	Communication problems
W3.2.5	129_006	21/11/2005		53 10.74	38 08.70	Upcast of W3.2.5
W3.2.4	129_007	21/11/2005	21:24	53 21.66	38 04.84	Haul aborted CTD problems
W3.2.4	129_008	21/11/2005	23:25	53 21.66	38 04.86	

Table 3 CTD bottle firing depths and salinity bottle information

CTD cast / Bottle No.	129_001	129_002	129_003	129_004	129_006	129_008
1	1000	1000 (*1)			1000(9)	1000(17,19)
2	1000	1000(2,3)			1000	1000(20)
3	1000	900(4)			1000	900(21)
4	1000	900			1000(10,11)	800(22)
5	1000	800(5)			900(12)	700(23)
6	1000	700(6)			800(13)	600(24)
7		700			700(14)	500(1-1)
8		600(7)			700	
9		500(8)			600(15)	
10		500			600	
11		400			500(16)	
12		400			500	

* Salinity sample numbers are 10-number

Table 4 CPR Start and stop position and times

CPR tow	Start date/time	Stop date/time	Start lat/lon	Stop lat/lon
163/0	27/11/05 23:11	29/11/05 07:27	54,11.8 36,27.3	52,34.1 46,49.9
163/1	29/11/05 07:39	30/11/05 16:24	52,33.96 46,51.43	51,55.7 57,35.7

Transect Log

Time	Latitude	Longitude	Transect	Comment	User	
30/11/2005 16:24	-51.92241	-57.40523		Recovered CPR 163/1	ek60	
29/11/2005 07:42	-52.56534	-46.86896		10 knots speed achieved (max for conditions)	ek60	
29/11/2005 07:39	-52.56577	-46.85902		CPR 163/1 deployed 401 miles on nav	ek60	
29/11/2005 07:27	-52.56841	-46.83064		CPR 163/0 recovered	ek60	
29/11/2005 07:19	-52.57117	-46.80745		6 knots ready for recovery	ek60	
27/11/2005 23:19	-54.17774	-36.45115		Speed 12 knots	ek60	
27/11/2005 23:10	-54.19685	-36.45558	CPR 163/0 in the water	Speed 6 knots	ek60	
22/11/2005 21:45	-53.85728	-37.59307	4.2 (Transect 8)	XBT xbt.0017 END	ek60	
22/11/2005 20:38	-53.67752	-37.65448	4.2 (Transect 8)	XBT xbt.0016	ek60	
22/11/2005 19:34	-53.50273	-37.71276	4.2 (Transect 8)	XBT xbt.0015	ek60	
22/11/2005 18:48	-53.37854	-37.75523	4.2 (Transect 8)	XBT xbt.0014	ek60	
22/11/2005 18:29	-53.32921	-37.77044	4.2 (Transect 8)	XBT failed	ek60	
22/11/2005 17:28	-53.15978	-37.82699	4.2 (Transect 8)	XBT xbt.0013 Start of transect speed 10 knots	ek60	
22/11/2005 16:42	-53.16017	-37.96542	4.1 (Transect 7)	XBT xbt.0012 End transect 10 knots	ek60	
22/11/2005 15:37	-53.33604	-37.90234	4.1 (Transect 7)	XBT xbt.0011	ek60	
22/11/2005 14:50	-53.46634	-37.86272	4.1 (Transect 7)	Speed 10 knots	ek60	
22/11/2005 14:30	-53.51419	-37.84721	4.1 (Transect 7)	XBT xbt.0010 Speed 7ish knots rolling lots	ek60	
22/11/2005 13:29	-53.67468	-37.79339	4.1 (Transect 7)	Speed 10 knots	ek60	
22/11/2005 13:21	-53.69216	-37.78717	4.1 (Transect 7)	XBT xbt.0009	ek60	
22/11/2005 13:16	-53.70433	-37.78343	4.1 (Transect 7)	Speed 7 knots	ek60	
22/11/2005 12:30	-53.83058	-37.74145	4.1 (Transect 7)	Speed 10 knots	ek60	
22/11/2005 12:26	-53.84147	-37.73885	4.1 (Transect 7)	Speed 9 knots	ek60	
22/11/2005 12:23	-53.84919	-37.7348	4.1 (Transect 7)	Speed 9.5 knots	ek60	
22/11/2005 12:13	-53.86954	-37.72783	4.1 (Transect 7)	Commence transect xbt_0008 Speed 7 knots	ek60	
22/11/2005 06:49	-53.66298	-37.74526		ADCP turned off in preparation of EK transect	ek60	
22/11/2005 01:29	-53.52435	-38.00484		Science stopped due to bad weather	ek60	
21/11/2005 23:25	-53.36107	-38.08059	CTD JR129.008	Salinity samples taken	ek60	
21/11/2005 21:24	-53.36095	-38.08056	CTD JR129.007	CTD aborted communication problems	ek60	

21/11/2005 20:45	-53.33087	-38.09399		ADCP on - 16 m bins deep water no bt	ek60	
21/11/2005 18:33	-53.17904	-38.14455	CTD JR129.005 and JR129.006	Gantry and CTD problems	ek60	
21/11/2005 18:17	-53.18075	-38.14213	3.2 (Transect 6)	End of transect	ek60	
21/11/2005 18:10	-53.19827	-38.13598	3.2 (Transect 6)	Speed 8.5 knots	ek60	
21/11/2005 18:04	-53.21365	-38.13077	3.2 (Transect 6)	Speed 10 knots	ek60	
21/11/2005 17:53	-53.24054	-38.12171	3.2 (Transect 6)	Speed 9 knot	ek60	
21/11/2005 17:40	-53.27423	-38.11079	3.2 (Transect 6)	Speed 10 knots	ek60	
21/11/2005 17:11	-53.34957	-38.086	3.2 (Transect 6)	Speed 9 knots	ek60	
21/11/2005 16:25	-53.46598	-38.04785	3.2 (Transect 6)	Speed 10 knots	ek60	
21/11/2005 15:07	-53.67104	-37.97941	3.2 (Transect 6)	Speed 9 knots	ek60	
21/11/2005 14:28	-53.77491	-37.94466	3.2 (Transect 6)	EA changed to active	ek60	
21/11/2005 13:56	-53.86103	-37.91439		Ship running on 3000 revs	ek60	
21/11/2005 13:46	-53.88947	-37.90635	3.2 (Transect 6)	Commenced transect 3.2 speed 10 knots	ek60	
21/11/2005 13:43	-53.89647	-37.90241	3.2 (transect 6)	Speed 9.5 knots	ek60	
21/11/2005 13:42	-53.89842	-37.901	3.2 (transect 6)	EA in passive mode	ek60	
21/11/2005 12:18	-53.92607	-38.22204	3.1 (Transect 5)	XBT xbt_0007 waypoint passed end transect	ek60	
21/11/2005 12:15	-53.91991	-38.22375	3.1 (Transect 5)	Speed 7 knots	ek60	
21/11/2005 11:28	-53.79227	-38.26428	3.1 (transect 5)	Speed 10 knots	ek60	
21/11/2005 11:09	-53.74856	-38.27866	3.1 (transect 5)	XBT xbt_0005 and xbt_0006	ek60	
21/11/2005 11:00	-53.72756	-38.28529	3.1 (transect 5)	Speed 7 knots	ek60	
21/11/2005 10:31	-53.64833	-38.31142	3.1 (transect 5)	EA onto active	ek60	
21/11/2005 10:07	-53.58354	-38.33118	3.1 (transect 5)	Speed 10 knots	ek60	
21/11/2005 10:02	-53.57388	-38.33512	3.1 (transect 5)	XBT xbt_0004	ek60	
21/11/2005 09:59	-53.56803	-38.33697	3.1 (transect 5)	Speed 7 knots	ek60	
21/11/2005 09:10	-53.43587	-38.37936	3.1 (transect 5)	Speed 10 knots	ek60	
21/11/2005 09:07	-53.4287	-38.38187	3.1 (transect 5)	Speed 9.5 knots	ek60	
21/11/2005 09:03	-53.41797	-38.3852	3.1 (transect 5)	Speed 9 knots	ek60	
21/11/2005 08:56	-53.40131	-38.39057	3.1 (transect5)	XBT xbt_0003	ek60	
21/11/2005 08:53	-53.39554	-38.39273	3.1 (transect 5)	Through waypoint	ek60	
21/11/2005 08:48	-53.38659	-38.39575	3.1 (transect 5)	speed 7 knots	ek60	

21/11/2005 08:08	-53.27767	-38.43058	3.1 (transect 5)	EA500 set in passive mode	ek60	
21/11/2005 08:05	-53.27069	-38.43273	3.1 (transect 5)	Ocean logger started again	ek60	
21/11/2005 07:55	-53.24523	-38.44108	3.1 (transect 5)	speed 10 knots	ek60	
21/11/2005 07:45	-53.22172	-38.44955	3.1 (transect 5)	XBT xbt_00002	7 knots	ek60
21/11/2005 07:45	-53.22073	-38.44955	3.1 (transect 5)	Start transect	ek60	
21/11/2005 07:33	-53.2174	-38.44945		Reboot EK60	ek60	
21/11/2005 07:30	-53.21394	-38.451		Ocean logger flow not good	ek60	
20/11/2005 21:42	-53.24701	-38.76167	CTDs cancelled	Due to bad weather and gantry issues	ek60	
20/11/2005 20:44	-53.25512	-38.7501	2.2 (transect 4)	End of transect	ek60	
20/11/2005 20:06	-53.32819	-38.72048	2.2 (transect 4)	speed 7 knots	ek60	
20/11/2005 20:03	-53.3325	-38.72029	2.2 (transect 4)	speed 7.5 knots	ek60	
20/11/2005 20:02	-53.33597	-38.71998	2.2 (transect 4)	speed 8 knots	ek60	
20/11/2005 19:50	-53.35943	-38.71813	2.2 (transect 4)	speed 7 knots	ek60	
20/11/2005 19:15	-53.42836	-38.69542	2.2 (transect 4)	pass waypoint	ek60	
20/11/2005 18:17	-53.53252	-38.66353	2.2 (transect 4)	Speed 6.5 knots	ek60	
20/11/2005 18:04	-53.55635	-38.65643	2.2 (transect 4)	Speed 7.5 knots	ek60	
20/11/2005 17:36	-53.6039	-38.64102	2.2 (transect 4)	speed 6 knots	ek60	
20/11/2005 16:54	-53.67308	-38.61871	2.2 (transect 4)	speed 5 knots	ek60	
20/11/2005 16:03	-53.7598	-38.59104	2.2 (transect 4)	speed 5.5 knots	ek60	
20/11/2005 15:59	-53.76585	-38.58938	2.2 (transect 4)	speed 6.5 knots	ek60	
20/11/2005 15:39	-53.80181	-38.57809	2.2 (transect 4)	speed 6 knots	ek60	
20/11/2005 15:37	-53.80445	-38.57704	2.2 (transect 4)	speed 5.6 knots	ek60	
20/11/2005 15:15	-53.84293	-38.56478	2.2 (transect 4)	Speed 6.5 knots	ek60	
20/11/2005 14:41	-53.90162	-38.54551	2.2 (transect 4)	speed 7 knots	ek60	
20/11/2005 14:25	-53.9319	-38.53628	2.2 (transect 4)	Speed 8 knots	ek60	
20/11/2005 14:13	-53.95538	-38.52764	2.2 (transect 4)	Speed 7 knots	ek60	
20/11/2005 14:10	-53.96118	-38.52581	2.2 (transect 4)	Transect commenced - speed 6 knots	ek60	
20/11/2005 03:24	-54.02798	-39.08497		5th core box CTD cancelled	ek60	
20/11/2005 00:53	-53.84746	-39.14434	CTD JR129_004	nCTD	ek60	
19/11/2005 22:27	-53.67031	-39.19722	CTD JR129_003	nCTD	ek60	

19/11/2005 20:21	-53.49344	-39.25149	CTD JR129_002	Salinity samples taken	ek60	
19/11/2005 18:12	-53.31482	-39.30639	CTD JR129_001	Bottles fired as test - an nCTD	ek60	
19/11/2005 15:27	-53.69448	-39.19027	1.2 (transect 2)	Change range settings to 750 on 38 kHz	ek60	
19/11/2005 13:57	-53.94249	-39.11418	1.2 (transect 2)	EA set to 20 second ping rate	ek60	
19/11/2005 13:49	-53.96434	-39.10754	1.2 (transect 2)	Speed back to 10 knots	ek60	
19/11/2005 13:44	-53.9755	-39.10399	1.2 (transect 2)	Speed reduced to 9 knots due to engine problems	ek60	
19/11/2005 13:28	-54.01847	-39.08989	1.2 (transect 2)	Start at 10 knots (transect 1.2)	ek60	
19/11/2005 12:44	-54.03865	-39.08388	1.2 (transect 2)	Test CTD	ek60	