

UAB'07 Experiment Test Plan

Hopavagen Bay and Trondheimsfjord (Norway), September 2 - 15, 2007

Ver 1.1 - August 28, 2007

research funded under the Hydralab III Integrated Infrastructure
and project UAB, POCI program - FCT Portugal.



UAB'07, 2 - 15 September, 2007

Summary

- Experiment identification
- Objectives and relevance
- Trial area
- Description of operations
- Equipment involved
- Personnel
- Responsibilities, reporting and data handling

Experiment Identification

Title: UAB'07
Period covered: 2 - 15 September 2007
Test location: Bay of Hopavagen (Sletvik field station)
Other location: TBS, Trondheim
Scientist in Charge: S.M. Jesus (UALG)
Local Scientist: Jens Hovem (NTNU)
Technical Coordinator: António J. Silva (UALG)
Project: UAB POCI/MAR/59008/2004
Participating vessels: S/V CALANUS (Sep 7-14)
Other involved units: R/V GUNNERUS (Sep 4-6)
Participating institutions: UALG, NTNU

Objectives and relevance

The objectives of the UAB'07 experiment fulfill the general requirements of UAB project (namely tasks 3 and 4 of the Technical Annex):

1. to test the Transmit - Receive Array in real conditions
2. to acquire acoustic data for testing the acoustic barrier concept in environmentally controlled conditions.
3. to perform a preliminary test of MIMO communications
4. to determine communication system sensitivity to geometric and environmental variability

Principal Resources Required

At the TBS (Trondheimsfjord)



2× 916 C Lubell source for MIMO coms
Acoustic source Lubell 1424HP
AOB22 buoy

At the Sletvik field station



small ship
pier
2× Lubell 916C as TRA system
AOB22 buoy
Acoustic source Lubell 1424HP

Experiment areas

Bay of Hopavagen,
Trondheim (Norway)



Trondheim Fjord
TB Station



Work plan at the Trondheim Biological Station

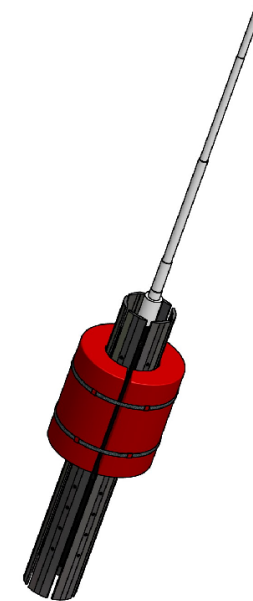
- Sept 1:** team arrival in Trondheim;
- Sept 2:** visit TBS and see conditions for equipment deployment;
- Sept 3:** equipment reception, transportation and installation at TBS and on board R/V Gunnerus;
- Sept 4:** deploy Lubell 1424HP from TBS pier transmitting PSK modulated signals at various rates and frequencies; deploy AOB22 from R/V Gunnerus by 100m water depth and let it drift; receive channel probes and PSK modulated signals on AOB22 VLA; reposition AOB22 if needed; make CTDs from pier and from R/V Callanus; record temp. and array depth on AOB22;
- Sept 5:** deploy also 916C source from pier and transmitt signals in two frequency bands above and below 10 kHz for field calibration testing; record depth data on AOB22;
- Sept 6:** deploy 916C Lubell sources on pier and transmitt MIMO coded signals to AOB22;
- Sept 7:** recover all equipment and pack; transportation to Sletvik station;

Work plan at the Sletvik station

- Sept 8:** installation in Sletvik
- Sept 9:** start deploying 1424 Lubell source from pier and AOB22 VLA from small ship for acoustic testing at various ranges and depths; record temperature profiles and bathymetry;
- Sept 10:** test environmental equalizer principle for range / depth waveguide invariant compensation;
- Sept 11:** deploy two 916C acoustic sources either from pier or from small ship; receive on AOB22 either attached to small ship or moored; test underwater barriers at various ranges, depths, frequencies, renew rates, etc...
- Sept 12:** underwater acoustic barriers testing with passing target between source array and hyd receiver;
- Sept 13:** spare day;
- Sept 14:** equipment recover and pack; transportation to Trondheim TBS.
- Sept 15:** team departure from Trondheim;
- Sept 17:** equipment departure from Trondheim.

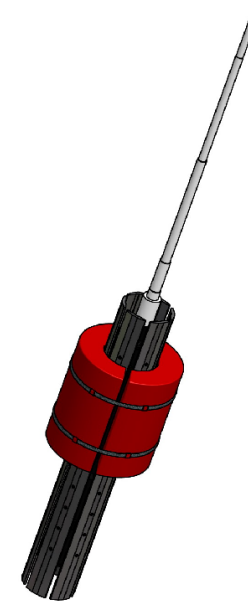
Equipment involved (1)

Name	AOB
Version	2
Model	002
Type	Acoustic VLA
Aperture	66 m
No. sections	1
No. channels	16
Hydrophone depths (m)	
model 002	hyd 1 at 6 m, spacing 4m
Frequency band	0 - 16 kHz
Sampling frequency	50 kHz (GPS synchro)
AD conversion	16 bits
Bit rate	15.36 Mb/s



Equipment involved(2)

No. thermistors	16
model 002	@hyd depths, $F_s=4$ Hz
Battery	48 Ah/15 V
Autonomy	11 to 13 h
Data storage	120 GB
Wirelesslan	802.11b
Wirelesslan amp.	1 W
Wirelesslan antenna	omni 7 dBi
Weight (air/water)	41.4 / 10 Kg
Height w/mast	300 cm
Width w/ float	40 cm
Ballast	10 Kg



Equipment involved(3)

Acoustic sound sources

Brandt/model	Lubell / 1424HP
Frequency band (Hz)	500 - 8000
Sound level (dB/ μ Pa/m)	197
Max depth (m)	12
Tow speed max (kn)	3 (with fish)



Brandt/model	Lubell / 916C
Frequency band (kHz)	1 - 18
Sound level (dB/ μ Pa/m)	180
Max depth (m)	15
Tow speed max (kn)	Not specified



Personnel

UALG

Sérgio Jesus	Sep. 9 - 15 (Sletvik)
Friedrich Zabel	Sep. 1 - 15 (Trondheim, Sletvik)
Celestino Martins	Sep. 1 - 15 (Trondheim, Sletvik)
António Silva	Sep. 2 - 8 (Trondheim)

NTNU

Jens Hovem

Responsibilities, reporting and data handling

UALG Responsibilities

- AOB and Lubell sources preparation for deployment/recover;
- data monitoring, backup storage and delivery to partners;
- all arrangements for transportation of equipment and personnel.

Reporting

UALG ensures to deliver a data report within three months after cruise end and scientific publications within one year.

Data handling

An estimate of 1 TB of data is expected to be gathered during this experiment. This data will be stored on hard disk and is available to experiment participants. It may be also delivered on the same media and under EU facility agreement to other recipients upon request.