

## Annex IV Instruments and fishing gear used

### Acoustic instruments

The SIMRAD EK500/38 KHZ scientific sounder was used during the survey for estimation of fish density. The EK500 has a built- in digital echo integrator, but the Bergen Echo Integrator system (BEI) was used throughout the survey. The details of the instrument settings are as follows:

#### Transceiver settings:

Bandwidth	Wide (3.8 KHz)
Pulse length	Medium (1 ms)
Max Power	2000 Watt
Sv Transducer gain	27.8 dB
Ts Transducer gain	28.1 dB

#### Printer settings:

Range	0 - 100 or 0 - 250 m
TVG	20 log R
TS Colour min	- 50 dB
Sv Colour min	- 64 dB

An ES38B with a 6.8° -3dB beamwidth transducer was used for integration.

A calibration experiment using a standard copper sphere, performed in Baia dos Tigres 23/2 1994 gave the following results: Sv Transducer gain 27.8 dB, Ts Transducer gain 28.1 dB.

#### Glossary:

Sv Transducer gain: Peak transducer gain assumed during computation of volume backscattering strength.

Ts Transducer gain: Peak transducer gain assumed during computation of target strength.

Ts Colour min: Lower limit of colour scale relative to target strength.

Sv Colour min: Lower limit of colour scale relative to volume back scattering.

## **Hydrography**

Conductivity, temperature, density and oxygen were sampled regularly at CTD stations with a Seabird CTD-sonde. The salinity was calculated by a computer.

## **Fishing gear**

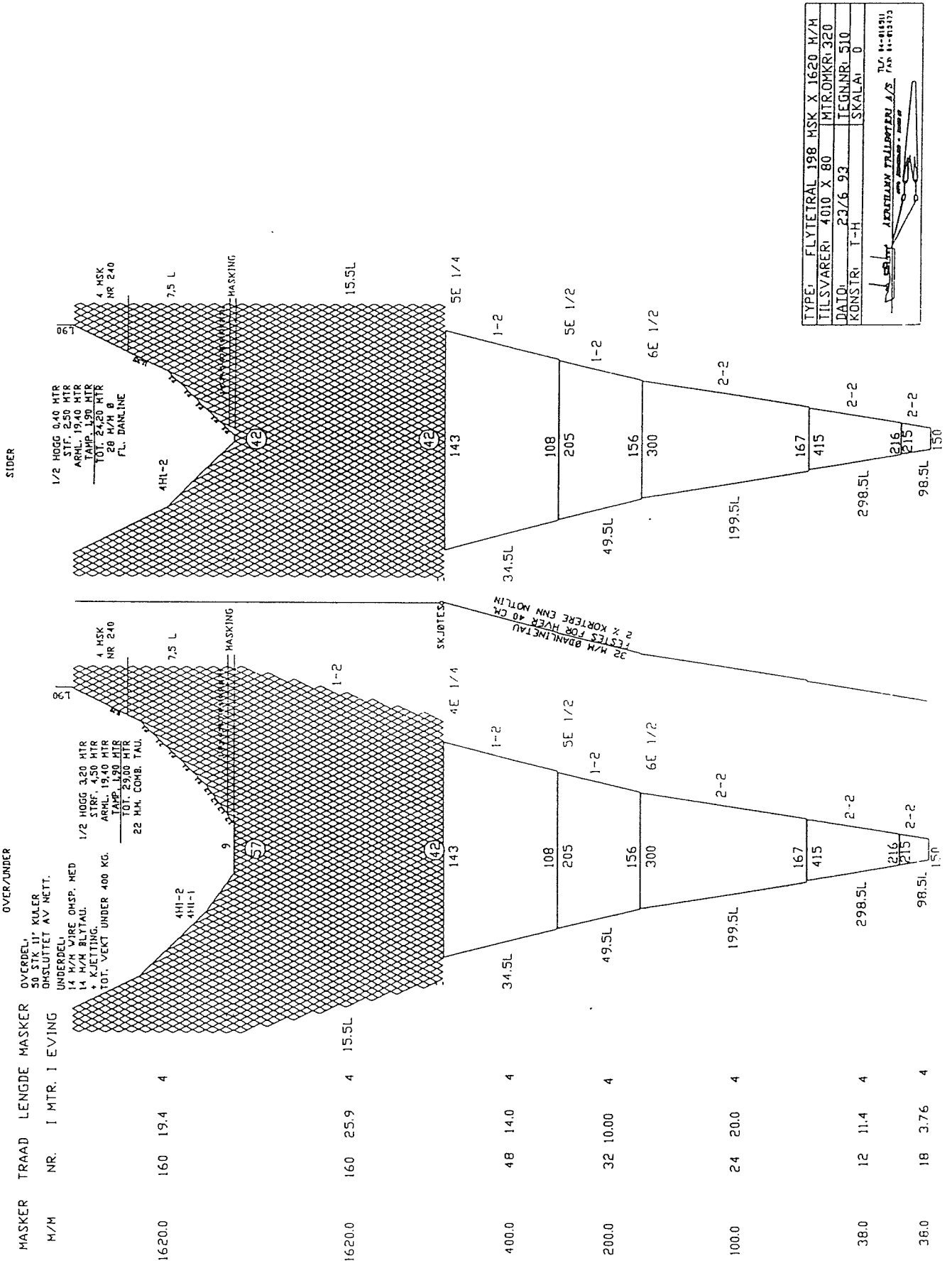
The vessel has two different sized 'Åkrahavn' pelagic trawls and one Gisund super bottom trawl. Only the bottom trawl was used during the survey.

The bottom trawl has a headline of 31m, footrope 47m and 20mm meshsize in the codend with an innernet of 10mm meshsize. The estimated headline height is 5m and distance between the wings during towing about 18m. The trawl is equipped with a 12" rubber bobbins gear and 6m<sup>2</sup>, 1500kg 'Egersund' combi-doors. The sweeps are 40m long.

The following drawings show the size of these trawls.



# F/F Dr. Fridtjof Nansen



TYPE:	FLYTEIRAL 198 MSK X 1620 H/M
TILSVARER:	4010 X 80 MTR.OMKRI.320
DATE:	23/6-93
KONSTR:	T-H
SKALAN:	0

TEL: 01-01911  
 PER: 01-01373

Bottom trawl: High opening shrimp and fish trawl with net headline 31 m (floatline), foot-rope 47 m, gear with 12 cm diameter roller disks, 40 m sweeps, estimated headline height 6 m and distance between wings during towing 18-20m.

