



SNOW-  
STREAMER\*

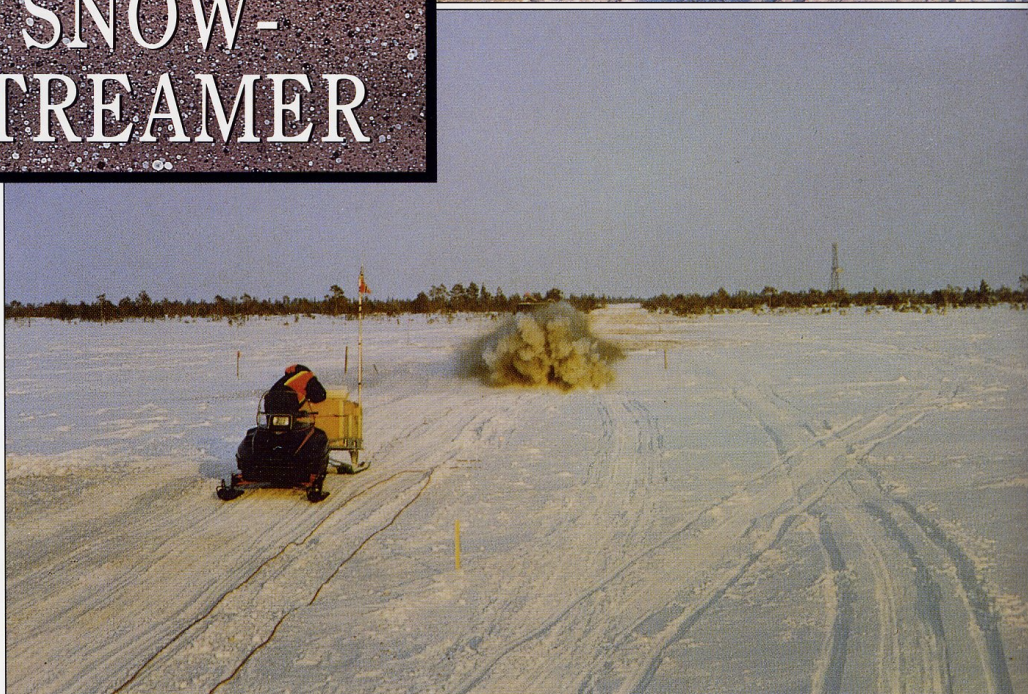
Schlumberger

GECO-PRAKLA

\* Under license from Norsk Hydro a.s, Oslo, Norway.



## SNOW- STREAMER



### **NEW TECHNOLOGY FOR HIGH PRODUCTION OF QUALITY SEISMIC DATA IN THE ARCTIC REGIONS**

Seismic acquisition in the Arctic regions has historically been a very difficult and expensive operation.

At the end of 1987 Norsk Hydro and the University of Bergen began developing the snowstreamer technology in cooperation with Fjord Instruments, a GECO-PRAKLA subsidiary. The main objective was to develop a system for high production of good quality field data using a small crew.

The snowstreamer system is a towed geophone spread consisting of a main cable with attached gimbaled geophone strings. The snowstreamer is normally handled from a towed reel/winch-system, it is deployed from the winch and laid out on the line. The recording vehicle tows the streamer from shotpoint to shotpoint along the line. When the line is completed the streamer is spooled on the reel and towed to the next line. With shotpoints every 50 meters more than 3 km of data per hour could be recorded. The recording speed depends upon the distance between shotpoints and the surface conditions. The prototype system consisted of a 1500 meters long streamer with geophone groups every 25 meters.



A snowstreamer recording crew, operating a 1500 meters streamer, typically consists of six operators including one shooter and one shooter assistant. If a 3000 meters streamer is used, the crew is increased by two people. In addition to the recording crew the operations require drillers/loaders, surveyors and general field base personnel.

#### TECHNICAL DESCRIPTION OF THE SNOWSTREAMER SYSTEM

Typical system:

Total length :1500 meters

Number of groups :60 ea.

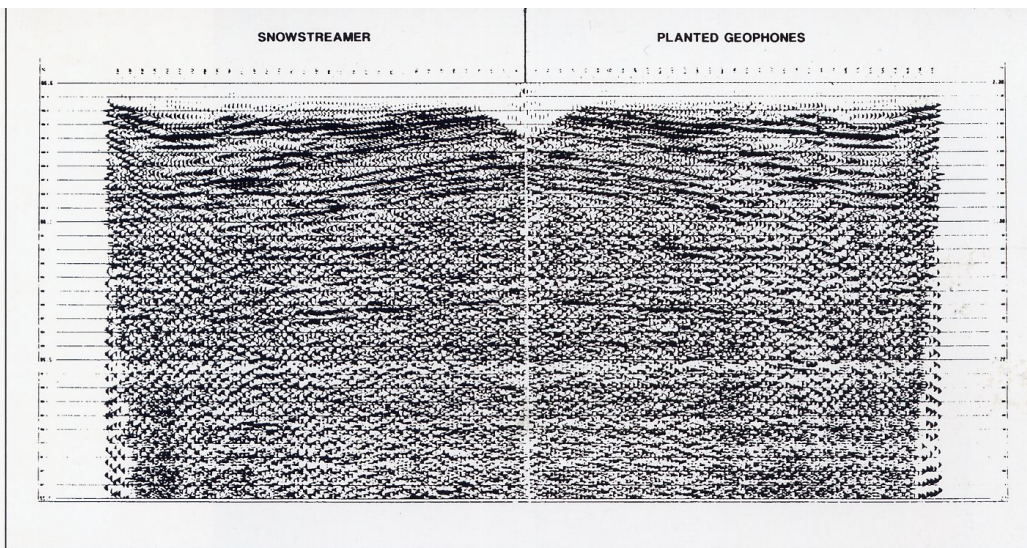
Distance between groups :25 meters

Geophonestring (group) :8 ea. gimbaled geophones in serial (equal distance between geophones)

Two systems can be operated together and give a 3000 meters long spread, with 120 channels of 25 meters group lengths.

The system has a limited flexibility with respect to group lengths and number of geophones per string. The streamer is manufactured with a set distance between take-outs and therefore with fixed distance between groups.

It is possible however, to manufacture snowstreamers to suit specific client needs.



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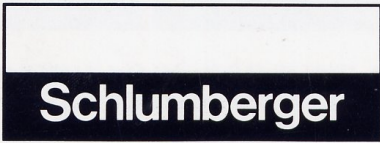
Experimental tests have been conducted to compare the data acquired using conventional planted geophones with the data obtained using the snowstreamer. The sources used have been detonating cord on the surface, dynamite in shotholes and vibrators. The tests show that snowstreamer with towed geophones produces data quality equivalent to that obtained using planted geophones.

The tests and operations have given good, reproducible results in various terrains and conditions.

The main limitation in keeping a high production rate is related to the energy source. Up to 60 shots per hour can be recorded. Most of our experience is gained in permafrost areas where we have been able to use detonating cord laid on the surface as the energy source.

### SNOWSTREAMER OPERATIONS

Spitzbergen	1987	April	40 km
Spitzbergen	1988	April	400 km
Spitzbergen	1989	April	300 km
Antarctic	1990	December	90 km
West Siberia	1991	March	80 km
Spitzbergen	1991	April	200 km
Canada	1991	April	90 km



## GECO-PRAKLA

### GECO-PRAKLA CORPORATE OFFICE

42, rue Saint-Dominique  
75007 Paris  
France  
Telephone: (1) 40 62 10 00  
Telefax: (1) 40 62 10 56  
Telex: 205844 slpar

### EUROPE AND AFRICA, MARINE

Bjergstedvn. 1  
P.O. Box 330  
N-4001 Stavanger  
Norway  
Telephone: (4) 50 65 50  
Telefax: (4) 50 64 50  
Telex: 33 268 gecoss n

### EUROPE, AFRICA AND MIDDLE EAST, LAND

Buchholzer Strasse 100  
P.O. Box 51 05 30  
D-3000 Hannover 51  
Germany  
Telephone: (511) 6420  
Telefax: (511) 647 6860  
Telex: 922 847 prakl d

### NORTH AND SOUTH AMERICA

1325 South Dairy Ashford  
Houston Texas 77077  
USA  
Telephone: (713) 870 1880  
Telefax: (713) 870 8135  
Telex: 166 130 gecoss ut

### ASIA

80 Marine Parade Road  
# 19-08/09 Parkway Parade  
Singapore 1544  
Telephone: (65) 344 2725  
Telefax: (65) 344 5827  
Telex: RS 20462 gecoss i

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