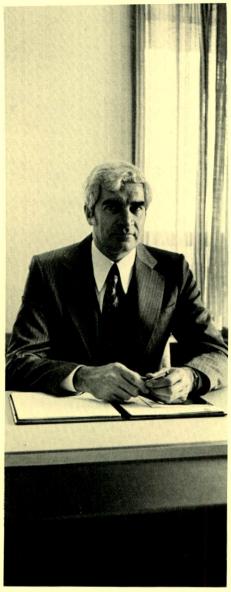
TENTH ANNUAL REPORT 1979

FATHOM OCEANOLOGY LIMITED

# Directors' report to the shareholders



John B. Stirling, President and C.E.O.

#### Foreword

This fiscal year completes Fathom's tenth year of business activities. Your management feels that this issue of the Annual Report, in featuring the people of Fathom, salutes the great contribution that the employees have made through their untiring efforts — not only in Manufacturing, where the fruits of everyone's labour are more obvious — but in Engineering, in Research, Marketing, and support services such as Accounting, Administration and Quality Control.

The following statements are the financial expression of the progress of the company's fortunes that has been made during the year. In the few paragraphs which follow this introduction, we will highlight some key elements of our 1979 fiscal year.

#### Summary

Net income for the year ended March 31, 1979 was \$302,000 or 20¢ per share, including an extraordinary item arising from the reduction in income taxes due to loss carry forward of \$130,000 or 9¢ per share. This compares with a net income of \$157,600 or 10¢ per share reported for the previous fiscal year.

Excellent progress was made during the year on all major contracts and, as a result, gross revenue increased by 28% to \$2,325,500 from \$1,814,800 in the previous year.

Orders booked at a level of \$2,453,000 not only provided an increment for the current year's revenue, but also provide a strengthened base for operations in the years to come.

# Completed contracts and work in progress

This fiscal year saw satisfactory progress made in the manufacture of the first unit of six variable depth sonar towing systems for the Italian Navy being supplied to Raytheon Company.

Repeat business in the form of faired cable winches for Western Electric Corporation, and sonar domes for Raytheon Company together with numerous orders for FLEXNOSE<sup>TM</sup> and RIGSTREAM<sup>TM</sup> cable fairings accounted for a substantial portion of revenue for the year.

An order for PIPESTREAM<sup>TM</sup> fairing which was booked and shipped within the fiscal year confirmed our confidence in the value of the product for the offshore drilling business but the upsets in the world's oil production patterns, while perhaps on balance reinforcing future markets for PIPESTREAM<sup>TM</sup> and CASCAN<sup>TM</sup>, make forecasting difficult.

Orders for life cycle support spares for the Brazilian Navy VDS systems, originally sold to Edo Corporation, were booked late in the year and together with the sale of a towed water sampling system for a Finnish customer, will provide a significant contribution to next year's revenue.

The Engineering Department work load was lighter than expected during the latter part of the year's operations due to the decision of the United States Navy not to proceed beyond Stage 1 of the contract received in fiscal 1977.

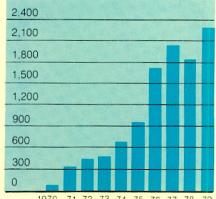
#### Operations

The appointment by the Board of Directors of a new President and Chief Executive Officer half way through the year provided an opportunity to review the organization structure of the company to provide for the orderly expansion of our business, to provide the necessary controls needed for the larger business volume being experienced, and to develop a climate for personnel development.

The organizational modifications which were approved by the Board of Directors in January, coincide with these objectives and provide for a management team reporting to the Chief Executive Officer.

Highlights	1979	1978
Revenue	\$2,325,000	\$1,815,000
Net income before extraordinary item — Per share — Fully diluted per share	\$ 172,000 \$ 0.11 0.09	\$ 91,000 \$ 0.06 0.05
Net income for the year  — Per share  — Fully diluted per share	\$ 302,000 \$ .20 .16	\$ 158,000 \$ .10 .09
Shareholders' equity	\$ 525,000	\$ 219,000

#### Revenue (\$ in thousands)



An important element of this change was the appointment of Mr. Neville E. Hale, formerly Vice President Engineering, as Vice President and Director of Research and Development. Fathom has prospered on new technology, and the concentration of Mr. Hale's efforts on this responsibility, guiding company resources through the newly founded Research and Development Committee is expected to provide an even more significant contribution to the progress of the company in the years ahead.

The establishment of a Quality Assurance department headed by a qualified individual is proving most effective in helping to achieve the high standards of design, workmanship and material selection necessary for the sophisticated equipment which we supply to exacting customers.

A review of our Marketing Organization has led to a decision to make further additions and reinforce the planning aspect of the Marketing function, and at the same time, review the effectiveness of our Sales approach to certain areas.

The Manufacturing Department has proved its mettle in raising the revenue for the year by 28% while at the same time making the necessary changes in plant facilities and capital acquisitions.

In this context, it might be noted that a decision was made to negotiate a lease extension on the present Rangeview Road facility for one year, with an option available for a further extension to November 1, 1981. A much needed improvement to office arrangements has been planned and will be carried out in fiscal 1980 with the objective of improving the efficiency of the present staff and also to make room for the new hires needed to handle our growing business.

We have taken the opportunity to radically change the raw materials and finished goods storage system and as a consequence have improved the productive utilization of the manufacturing space.

The improvement of company policies in areas of need has paralleled the adjustments to the organization and the changes in the physical plant have positioned Fathom for improved profitability and growth for the future.

#### New product development

We have previously referred to the reinforcement of the Research and Development function within the company not only through the assignment of key people, but also through a modification of the corporate structure.

It should be noted here that steady progress has been made, not only on the technical side of our CASCAN™ development, but also on its commercial introduction. At this stage we believe that the product has a good future and that it will make a valuable contribution to the company's revenues in future years.

In the coming year we plan to review the funding of our Research and Development projects to take full advantage of the programs available in the Canadian context.

#### **Financial progress**

The charts below highlight in a graphic way the progress of the company in the specific terms of revenue, earnings and backlog over the ten years of its history.

The net income of \$302,000 is the best in the company's history, and this solid performance is matched by other equally significant results. For example, the bank indebtedness of fiscal 1978 has been converted to a cash and short term deposit position of \$233,000; receivables have doubled from \$301,000 to \$602,000; unbilled revenues and inventories have increased, a reflection of our growth; trade payables, at \$297,000 are 250% of their 1978 level; deferred revenue shows an enormous increase from \$18,000 to \$337,000 due to down payments received

from the export orders referred to previously in this report.

The improvements in our financial position will carry the company forward into fiscal 1980 and we expect that the results of next year will be equally gratifying. This progress gives your management team confirmation of the growth plans for the company.

#### The outlook

Because of our export orientation, Fathom has been insulated from many of the difficulties of serving Canada's domestic market. However, our country offers an excellent environment for growth in our selected markets, not only because Canada's natural resources ensure future potential, but also because Federal and Provincial policies provide valuable assistance and support.

We propose working from our strengthened base to develop the company, not only with products solely of our own conception, but also by means of adaptation, acquisition or license.

There is no doubt that Fathom, in concentrating in the ocean industry is tackling a difficult challenge. We intend to demonstrate that it also can continue to be a profitable one.

#### Staff and organization

During the year our work force grew to 63 people and we have already described the modifications to the organization which led to reinforcement of such functions as Research and Development, Quality Assurance and Shop Operations.

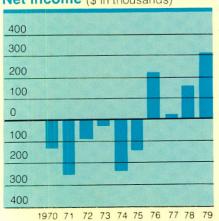
While sometimes emphasis is placed upon capital investment, the acquisition of machine tools and electronic wizardry — and these are important items — it is necessary to remember that much of the quality of a company's product is the result of the quality of its people.

We believe this is particularly true of Fathom, and it is also self-evident that no business grows and prospers without a staff dedicated to its success.

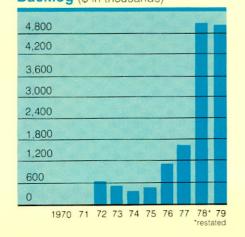
We are indeed fortunate to have on our payroll today, a number of key people whose services date back to the beginning of the company.

By featuring the people of Fathom in this Annual Report, portraying them at their places of work, the Directors salute their great contribution to the success that has been achieved.

Net income (\$ in thousands)



Backlog (\$ in thousands)



By order of the Board of Directors

John B. Stirling
President and Chief
Executive Officer

(Incorporated under the Canada Business Corporations Act)

## **Consolidated Balance Sheet**

March 31, 1979 (with comparative figures at March 31, 1978)

\$ 32,633 200,000 602,169	
200,000	
602 169	
002,100	\$300,640
	180,998
	51,442
25,452	14,16
1,170,190	547,24
345,333 274,041	250,784 236,447
274,041	236,447
619,374	487,231
400,025	330,085
219,349	157,146
35,321	37,960
254,670	195,106
	345,333 274,041 619,374 400,025 219,349 35,321

On behalf of the Board:

K. R. Olsen, Director

John B. Stirling, Director

Liabilities and shareholders' equity	1979	1978
Current liabilities:		
Bank indebtedness		\$ 49,394
Accounts payable and accrued charges	\$ 296,623	119,218
Billings in excess of costs and estimated		
earnings on uncompleted contracts	336,908	17,980
Due to Ontario Development Corporation (note 2(b)) —		
Export support loan	49,662	109,446
Current portion of venture capital loan	11,333	10,478
Total current liabilities	694,526	306,516
Long-term debt:	170.050	172.050
12% convertible notes (note 2(a))	172,050	172,050 45,075
Venture capital loan (note 2(b))	33,742	
Total long-term debt	205,792	217,125
Total liabilities	900,318	523,641
Shareholders' equity:		
Share capital (notes 2(a) and 3) —		
Authorized:		
3,000,000 common shares without nominal or par value		
Issued:		
1,536,667 common shares (1978 — 1,525,667 shares)	713,343	709,518
Deficit	(188,801)	(490,812)
Total shareholders' equity	524,542	218,706
	\$1,424,860	\$742,347

## **Consolidated Statement of Income and Deficit**

For the year ended March 31, 1979 (with comparative figures for 1978)

	1979	1978
Contract revenue	\$2,325,554	\$1,814,811
Costs:		
Manufacturing	1,396,972	1,186,501
Administrative	574,685	443,064
Interest — long-term debt	24,687	25,751
<ul> <li>bank and other indebtedness</li> </ul>	16,875	21,461
Foreign exchange loss (gain)	10,324	(19,560)
	2,023,543	1,657,217
Income before income taxes and extraordinary item	302,011	157,594
Income taxes	130,000	66,200
Income before extraordinary item	172,011	91,394
Extraordinary item — reduction in income taxes arising from losses carried forward (note 6)	130,000	66,200
Net income for the year	302,011	157,594
Deficit, beginning of year	(490,812)	(648,406)
Deficit, end of year	\$ (188,801)	\$ (490,812)
Income per share:		
Before extraordinary item	\$0.11	\$0.06
For the year	\$0.20	\$0.10
Fully diluted income per share:		00.05
Before extraordinary item	\$0.09	\$0.05
For the year	\$0.16	\$0.09

# Consolidated Statement of Changes in Financial Position For the year ended March 31, 1979 (with comparative figures for 1978)

1979	1978
\$ 172,011	\$ 91,394
79,231	83,838
251,242	175,232
130,000	66,200
3,825	2,785
385,067	244,217
11,333	41,823 10,478
A STATE OF THE STA	52,301
	191,916
240,725	48,809
\$ 475,664	\$240,725
\$1.170.190	\$547.241
	306,516
\$ 475,664	\$240,725
	\$ 172,011 79,231 251,242 130,000 3,825 385,067 138,795 11,333 150,128 234,939 240,725 \$ 475,664

## Notes to consolidated financial statements

March 31, 1979

#### 1. Accounting policies

The following is a summary of significant accounting policies followed in the preparation of the consolidated financial statements.

#### (a) Basis of consolidation -

The consolidated financial statements include the accounts of the company and its wholly-owned subsidiaries, Hale & Associates Limited and Fathom Inc.

#### (b) Contracts -

Profits on contracts are recorded using the percentage of completion method. Complete provision is made for losses on contracts in progress when they first become known. In the case of contracts extending over one or more years, revisions in cost and profit estimates, which can be significant, are reflected in the accounting period in which the relevant facts become known.

When the company enters into contracts with customers to develop and produce specialized equipment with the expectation that the Canadian government will share the specific development costs with the customer, the related government grants are accounted for as revenue by the company.

#### (c) Fixed assets -

Fixed assets are recorded at acquisition cost. Government grants of \$106,473 received specifically for certain fixed assets have been deducted from the acquisition cost of those assets. Costs which extend the useful life of a fixed asset are capitalized. All other costs of repairs and maintenance are charged to operations as incurred.

Depreciation is recorded in the accounts on the declining balance basis at the following annual rates:

Equipment 20% Tooling 331/3%

The costs incurred for patents, including patents pending, are capitalized and amortized on a straight-line basis over a ten year period. Leasehold improvements are amortized on a straight-line basis over the term of the lease.

#### (d) Research and development -

Research and development costs, excluding costs of patents and patents pending, are charged to operations as incurred. Where government grants are received for research and development projects initiated by the company for its own purposes, these grants are deducted from the research and development costs.

#### (e) Exchange translation —

Certain of the companies' transactions occur in foreign currencies. Current assets and current liabilities relating to these transactions have been translated into Canadian currency at the rate of exchange prevailing at the year end. Revenue and expenses have been translated at exchange rates prevailing on the date of such transactions. The exchange gains and losses arising on translation have been included in income for the year.

#### 2. Notes and loans payable

#### (a) 12% convertible notes -

The notes are convertible at any time at the option of the noteholder at the rate of 1 share for every \$0.60 of notes. The notes cannot be redeemed until the venture capital and export support loans (referred to below) have been repaid.

#### (b) Due to Ontario Development Corporation —

- (i) The venture capital loan, which matures in 1983 bears interest at 8% and is repayable in blended monthly payments of principal and interest of \$1,206.
- (ii) Under arrangements with respect to the export support loan the company may borrow up to \$500,000 at an interest rate of 113/4% annually to finance export orders.
- (iii) The venture capital and export support loans are secured by a floating charge on the company's assets and a chattel mortgage on equipment.

#### 3. Share capital

During the year:

- (a) 11,000 shares were issued for \$3,825 cash under the company's share purchase plan;
- (b) Options were granted to purchase 50,000 shares at \$0.63 per share and 15,000 shares at \$0.455 per share.

Under the share purchase plan certain senior officers and key employees have subscribed to purchase 22,000 shares at the lesser of the initial prices of \$0.315 and \$0.36 or 90% of the market price on the last market day of each subscription year exercised. These shares may be purchased up to February, 1981.

Under the company's stock option plan, options to purchase up to 120,000 shares at prices of \$0.315 and \$0.36 have been granted to certain senior officers in addition to those options referred to in (b) above. The options expire at various dates up to January, 1984.

#### 4. Commitments

- (a) Lease commitments with respect to the company's head office premises amount to \$42,000 annually to October, 1981
- (b) The company has purchased forward exchange contracts requiring delivery of U.S. \$2,845,000 in varying monthly amounts at an average exchange rate of \$1.145.

#### Contingent liabilities for Government of Canada grants

In previous years the company received grants of \$909,000 for the development of towing systems, of which \$650,000 may be repayable on the basis of future sales arising from the developed technology.

To March 31, 1979, no provisions have had to be made in the company's accounts with respect to the possible repayment of these grants.

#### 6. Income taxes

Prior years' losses of approximately \$200,000 are available to reduce taxable income of future years and expire for the most part in 1982 and 1983.

#### 7. Pension plan

During the year the company instituted a pension plan. Based on a valuation by the company's actuaries the present value of the unfunded service liability at March 31, 1979 amounted to \$96,000 which the company intends to fund and charge to earnings at the rate of \$10,000 annually over the next fourteen years. Current service costs of \$7,500 have been charged to operations during the year.

#### 8. Statutory information

During the year the aggregate direct remuneration paid to directors and senior officers was \$199,400.

#### 9. Comparative figures

Certain 1978 figures in the consolidated balance sheet and consolidated statements of changes in financial position have been reclassified to conform with the presentation adopted in 1979.

## Auditors' Report

To the Shareholders of Fathom Oceanology Limited:

We have examined the consolidated balance sheet of Fathom Oceanology Limited as at March 31, 1979 and the consolidated statements of income and deficit and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these consolidated financial statements present fairly the financial position of the company as at March 31, 1979 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Mississauga, Canada, May 25, 1979.

Clarkson, Gordon & Co., Chartered Accountants

# The company and its people 10 years of progress



The senior management group: left to right are Bob Walker, Marketing Manager; Jim Empey, Vice President Manufacturing; Neville Hale, Vice President & Director of R&D; John Stirling, President & Chief Executive Officer; David Ballem, Chief Engineer; Sam Fairles, Treasurer & Controller.

#### In 1968

Fathom Oceanology Limited was incorporated in December 1968 as a Canadian Corporation.

At the outset, the primary objective of the company was to translate and develop a unique technology into a viable commercial operation. The founders of Fathom were the principals and business associates of Hale & Associates Limited, a Toronto based engineering consulting company, all of whom were engaged in the towing technology developed under the sponsorship of the Department of Defence Production during the 1960's. Defence against submarines was the only objective at that time and it required high speed submerged towing of surveillance equipment from ships.

The founders of Fathom recognized the possibility of utilizing this new technology in both military surveillance and commercial exploration activity (oil, gas, minerals). Fathom Oceanology

Limited was set up as the vehicle through which this recognition would be exploited.

#### In 1970

The company first issued its shares to the public in September 1970.

The first significant commercial sale was to Texaco in Houston and the first important military sale was to the Royal Swedish Navy, both of which were secured about 15 months after incorporation. Thus began a business of an international character with customers in Australia, Brazil, Britain, Finland, France, Germany, Holland, Italy, Japan, Norway, Spain and the United States.

The primary product is a towing system which includes a submerged streamlined vehicle, the "fish", which is the platform for carrying the "black box", usually electronic, built by others. The fish is launched and towed at depth on a



Marketing Manager Bob Walker with staff members, (left to right) Elaine Wills, Linda McClennan and Tad Slupski.



The engineers confer: clockwise from the left are: Electrical Engineer Tony Orton, Chief Engineer David Ballem and senior designers Peter Hooiveld and Anna Fejes.

long cable which is streamlined with Fathom FLEXNOSE™ fairings to reduce cable drag. On the deck is the Fathom built launch and recovery mechanism, special winch and ship's motion compensating mechanism, hydraulic power supply and operator's console.

Applications of the system and related "black box" sensor package include —

- oil and gas search through seismic, sonar and hydrocarbon detection methods.
- viewing of the ocean floor by underwater TV.
- environmental surveillance water conditions, life content.
- mine countermeasure systems.
- submarine detection (variable depth sonar).

## In 1976

Early in fiscal 1976, with the emerging international acceptance of the Fathom expertise in towing systems and the resultant increase in business, a portion of the company's resources was focussed on the development of other proprietary products. It was recognized as particularly desirable to develop products that would generate repeat orders to balance the business of designing and building towing systems.

Two such products have been created and have generated new markets. The first of these is



Ken Berry, Manager Quality Assurance (left) with Chief Mechanical Designer Allen McLerie.



Purchasing Agent Gary Therrien with Planner & Estimator Alan Lindley.



Shop Supervisor Ron Palfrey; Manager of Manufacturing Bill Hickinbotham and Planner Bob Lennox meet in the shop.



Receptionist Jackie Wilson signs in a visitor.



V.P., Manufacturing Jim Empey (right) with Engineer Jim Benzie.



Treasurer and Controller Sam Fairles with Janet Muller.

RIGSTREAM™ fairing, a relatively low cost alternative to the sophisticated FLEXNOSE™ fairing that forms a vital part of the towing system. RIGSTREAM™ has also found a place in reducing cable drag on buoys moored in turbulent waters. The first such application came from the National Oceanographic and Atmospheric Administration (N.O.A.A.) for an environmental buoy moored in deep water off Hawaii. Many orders have followed from a variety of ocean-oriented organizations, around the world.

The second product is the highly successful PIPESTREAM™ fairing. These huge streamlined structures of high impact Cycolac plastic integrated with a tubular aluminum framework are assembled on offshore drill risers to permit drilling in deep waters. Sedco of Dallas was our first customer and first repeat order customer. Offshore International and Esso are also using PIPESTREAM™. This product has opened up the feasibility of drilling in the Amazon Delta where four knot currents made conventional bare drill risers unworkable. We are proud of this well publicized achievement. It has importance to the development of future energy resources.

#### In 1978

The company developed two other products, both allied to the PIPESTREAM™ market.

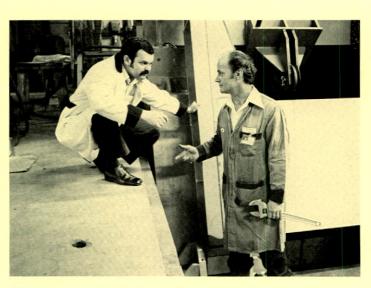


Model maker Rick Kemsley puts finishing touch to analytical Lead hand George Watt (right) talks with Remo LaTorre. model of towing system for major contract.



The first is a product known as STARSTRAKE™. It is a P.V.C. extrusion that when wrapped around a pipe in a helical fashion, prevents vortex shedding and pipe vibration when the pipe is subjected to surrounding water flow. Underwater pipelines and offshore structures, both existing and new, will be the market for this product. At existing sites retrofit by divers is possible.

The other product is known as CASCAN™. It is a new concept in compressed air buoyancy to offset drill riser weight in deep ocean drilling operations. CASCAN™ can be used in conjunction with PIPESTREAM™ if both depth and currents are involved. It can also be used independently for deep drilling where currents and tides do not impose a threat but only depth is a problem. A large potential market exists for CASCAN™ in the offshore oil drilling industry.



Bill Cumming (left), Testing & Field Service Technician meets on the shop floor with Gino Cavallin.

#### In 1979

The last decade has seen Fathom Oceanology Limited develop from the early recognition of a technical potential, to a profitable company selling to an international clientele.

The next decade will find man more and more concerned with ocean resources. Fathom is very much there and its constant and close association with the market puts it in a unique

position to develop and provide the equipment needed. It will do this.

## The People

At year end there were 63 people on the Fathom payroll. They are the company and their enthusiasm and dedication has generated the success. This report is a tribute to the loyalty of the entire Fathom team.



Left to right: John B. Stirling (seated), President & Chief Executive Officer; K. R. Olsen, Chairman; A. H. C. Lewis; K. A. Powers; R. L. I. Fjarlie (seated), Vice Chairman; N. E. Hale, Vice President & Director of R&D; J. M. Beresford and J. B. Foote.

#### **Directors**

\*K. R. OLSEN, Hudson, Quebec

Chairman, Fathom Oceanology Limited; Vice Chairman and Chief Executive Officer, G. M. Gest (1977) Inc. and subsidiaries; Executive Vice President, Atlas Construction Inc.

R. L. I. FJARLIE, Maxville, Ontario Vice Chairman, Fathom Oceanology Limited

J. B. STIRLING, Mississauga, Ontario President and Chief Executive Officer, Fathom Oceanology Limited

N. E. HALE, Mississauga, Ontario Vice President and Director of Research & Development, Fathom Oceanology Limited

\*K. A. POWERS, Toronto, Ontario Vice President, Federal Business Development Bank

\*J. B. FOOTE, Campbellcroft, Ontario Industrial Commissioner and Manager, Chamber of Commerce, Port Hope, Ontario

J. M. BERESFORD, Ottawa, Ontario President, Rideau Shipping Company Limited

\*A. H. C. LEWIS, Toronto, Ontario Vice President, Finance, Datacrown Limited

#### Officers

K. R. OLSEN, Chairman

R. L. I. FJARLIE, Vice Chairman

J. B. STIRLING, President and Chief Executive Officer

N. E. HALE, Vice President and Director of R&D

J. O. EMPEY, Vice President, Manufacturing

D. W. FAIRLES, Treasurer and Controller

R. A. DONALDSON, Secretary

R. R. WALKER, Marketing Manager

#### Head office and plant

863 Rangeview Road, Mississauga, Ontario, L5E 1H1

#### Subsidiary companies

Fathom Inc., Santa Barbara, California, U.S.A. Hale & Associates Limited, Mississauga, Ontario

#### Transfer agent and registrar

National Trust Company Limited, Toronto, Ontario and Calgary, Alberta

#### Banker

Bank of Montreal, Toronto, Ontario

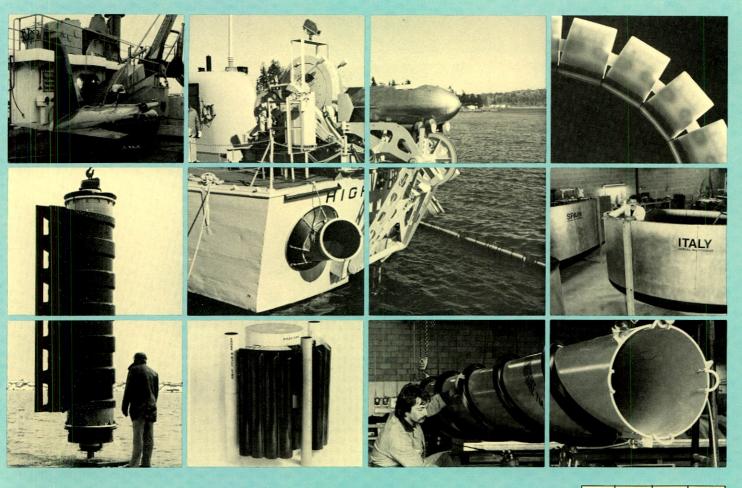
#### **Auditors**

Clarkson, Gordon & Co., Mississauga, Ontario

#### Legal counsel

Blake, Cassels & Graydon, Toronto, Ontario

<sup>\*</sup>Member of the Audit Committee



2	1	1	3
4	1	1	7
4	6	5	5

## Some of the company's products

- 1. Military towing system: For submarine defence the accent is on speed. Here a Fathom towing system is mounted on the after deck of the U.S. Government's hydrofoil 'Highpoint'.
- 2. Towing for commercial exploration: This fish is part of a towing system sold to the Government of West Germany. It houses sensing equipment used in the search for manganese nodule fields on the central Pacific floor, five miles below the surface.
- 3. The 'FLEXNOSE'TM cable fairing: The purpose of cable fairing is to cut down the hydrodynamic drag and prevent vortex shedding induced vibration. The Fathom designed low drag FLEXNOSETM fairing is designed to flex with the cable and pass over sheaves and winch drums at high cable tensions.
- 4. The PIPESTREAM™ fairing: Serving the same purpose as a cable fairing these huge fairings protect drill riser pipes on undersea oil wells. Each is fifteen feet high and seven feet nose to tail. The fairing is weightless in water and will pivot to any point of the compass as the currents shift.
- 5. STARSTRAKE™: A flexible extrusion wrapped around a pipe in a helical fashion to spoil vortex formation and prevent vibration in pipelines and offshore tubular structures. It can be added by divers to existing installation if it is necessary to correct critical situations.
- 6. CASCAN™ drill riser buoyancy system. For deep offshore drilling, it is necessary to offset about 95% of the drill riser weight in order to avoid 'impossible' stresses at the drill platform. CASCAN™ is a new concept in buoyancy systems having advantages over the traditional foam jackets and the air-can system made by others.
- 7. Sonar Domes: Sonar domes being made in the Fathom plant. The design of the Fathom dome is based on the water sandwich plate theory which shows that two skins properly spaced offer a much lower attenuation than a single skin structure.

#### Cover photograph

A section of cable streamlined with the exclusive Fathom FLEXNOSE<sup>TM</sup> fairing. Designed and patented by Fathom it permits a towed body to reach greater depths at higher speeds than any other design.

#### **Annual meeting**

The annual meeting of the Shareholders of Fathom Oceanology Limited will be held in the Library Room of the Royal York Hotel, Toronto at 4 P.M. on the 9th day of August 1979.



Solving problems in depth

