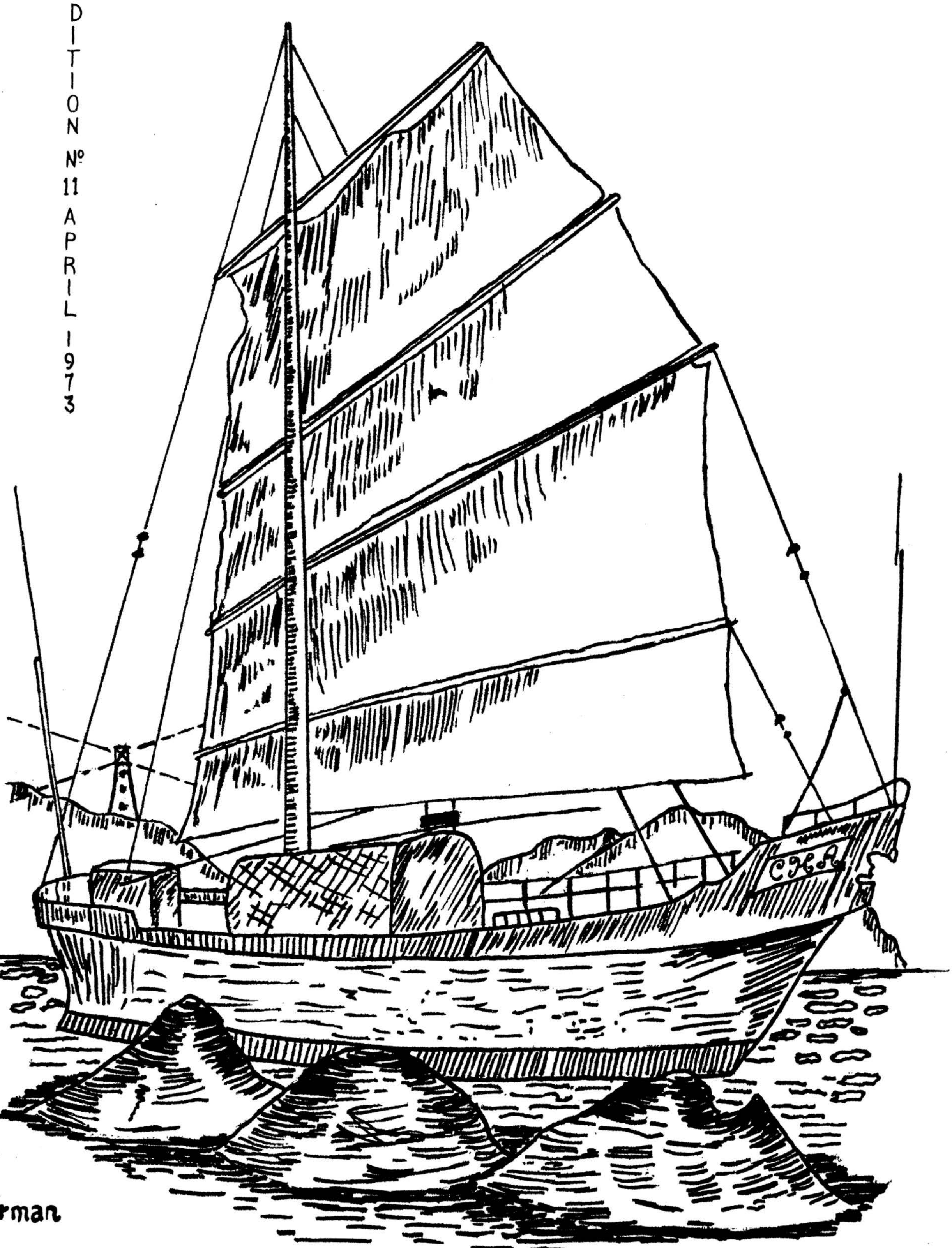
LIGHTHOUSE

EDITION No 11 APRIL 1973



Ian Norman

With the arrival of spring, the anxious field hydrographer is ready to "hit the high seas" in his never ending quest for knowledge. When the journey is over, and the experiences lived, the editors feel confident that members from all across the country will recollect their adventures in LIGHTHOUSE for all to enjoy.

Articles for Edition 12 of the CHA LIGHTHOUSE should be submitted before June 30, 1973.

Send any submissions to:

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TABLE OF CONTENTS

REPORT

ON

MINI-FIX OPERATIONS

JAMES BAY

1972

BAFFIN BAY
Devon Island
Lancaster Sound
Philpots Island
Melville Bay
Upernavik
Godhavn
Disko Bugt
Egedesminde
Søndre Strømfjord
Ice thickness 7020 ft.
Ice thickness 9710 ft.
Denmark
King Christian IX Land
Frederik VI Coast
Kap Farvel (Cape Farewell)
DAVIS STRAIT
Cumberland Sound
Exeter Sound
Cape Mercy
Frobisher Bay
Resolution Island
Button Islands
Killinek Island
HUDSON STRAIT
Ungava Bay
Akpatok Island
Payne Bay
Payne Lake
Chimo
Hebron
Nain
Hopedale
LABRADOR SEA
LABRADOR CURRENT
Cape Harrison
Hamilton Inlet
Sandwich Bay
Cartwright
Battle Harbour
Belle Isle
St. Anthony
Goose Bay
North West River
Schefferville
Knob Lake
Lac Bienville
Great Whale River
Little Whale
Clearwater Lake
Lake Minto
Port Harrison
Povungnituk
Povungnituk Bay
Cape Smith
Magnet Point
Ottawa Islands
Hopewell Islands
Sleeper Is.
King George Is.
North Belcher Is.
Belcher Islands
Cape Henrietta Maria
HUDSON BAY
FOXE BASIN
Foxe Channel
Foxe Peninsula
Cape Dorset
Southampton Island
Coats Island
Mansel Island
Nottingham Island
Salisbury Island
Charles I.
Wakeham Bay
Chubb Crater (New Quebec Crater)
Cape Southampton
Chesterfield Inlet
Baker Lake
Baker Foreland
Rankin Inlet
Eskimo Point
Ennadai
Nueltin Lake
Caribou
North River
Cape Churchill
Churchill
Cape Tatnam
York Factory
Fort Severn
Mid-Canada Line
Shamattawa
Gillam
Split Lake
Nelson House
Thicket Portage
Norway House
Grand Rapids
Berens River
Winnipeg
MANITOBA
ONTARIO
Winisk
Lake River
James Bay
Fort George
Attawapiskat
Fort Albany
Moosonee
Big Trout Lake
Big Beaver House
Lansdowne House
Red Lake
Pickle Lake
Pagwa River
Hearst
Kapuskasing
Cochrane
Timmins
Kirkland Lake
Coral Rapids
Lake Superior
Lake Michigan
Lake Huron
Fort William
Port Arthur
Nipigon
Duluth
Superior
Marquette
Sault Ste. Marie
Sudbury
North Bay
Ottawa
Pembroke
Kingston
Toronto
Hamilton
London
Windsor
Detroit
Chicago
Milwaukee
Grand Rapids
Kalamazoo
Cleveland
Buffalo
Rochester
Syracuse
Utica
NEW YORK
PENNSYLVANIA
Newark
Long Island
New Haven
Bridgeport
Providence
RHODE ISLAND
BOSTON
Cape Cod
New Bedford
Nantucket I.
Portland
Concord
Manchester
Georges Bank
Browns Bank
New England
St. Paul
Minneapolis
MINNESOTA
St. Cloud
Rochester
Mankato
Duluth
Des Moines
IOWA
Waterloo
Dubuque
Sioux City
Ft. Dodge
Omaha
QUEBEC
Quebec
Trois Rivieres
Shawinigan
La Tuque
Chicoutimi
Chibougamau
Mistassini Post
Lake Mistassini
Rupert House
Eastmain
Nemiscau
Sherbrooke
MONTREAL
Montreal
Gaspé Peninsula
Anticosti I.
Natashquan
Sept Iles
GULF OF ST. LAWRENCE
Magdalen Islands
PRINCE EDWARD ISLAND
NEW BRUNSWICK
Moncton
Fredericton
Saint John
NOVA SCOTIA
Halifax
Lunenburg
Bridgewater
Liverpool
Shelburne
Cape Sable
Yarmouth
Bay of Fundy
Sydney
Cape Breton Island
Sable Island
Port Hawkesbury
Strait of Canso
Corner Brook
NEWFOUNDLAND
Cabot Str.
Strait of Belle Isle

DATA SUMMARY

Mini-fix Positioning System

James Bay Survey

1972

Mode: Hyperbolic, multi-user.

Transmitter Frequency: 1702 KHz.

Transmitter Sites:

Master:	Station 72-1	Lat. 53 48' 43.137"	Long. 79 10' 28.708"
	UTM, Zone 17	N. 5,963,931.820	E. 620,188.046
Slave I:	Station 72-9	Lat. 53 18' 16.154"	Long. 79 39' 46.929"
		N. 5,906,759.490	E. 589,092.460
Slave II:	Station 72-12	Lat. 54 18' 19.039"	Long. 79 28' 55.768"
		N. 6,018,335.497	E. 598,764.294

Pattern I Baseline:

65.098798 Km.
35.151 Bautical miles
40.451 Statute miles

Pattern II Baseline:

58.484735 Km.
31.579 Nautical miles
36.341 Statute miles

Lane Counts (Observed):

Pattern I	739.75
Pattern II	664.60

Mean Propagation Velocity: 299,553.67 Km/sec.

Baseline lane width: 88.00049 metres.

INTRODUCTION

In order to provide a multi-user positioning system, affording a high degree of accuracy across a large expanse of water, the modified Mini-fix system was introduced into the 1972 James Bay survey.

The new system had been re-engineered to generate a 50 watt output as opposed to the standard 10 watt output. Only the transmitter sections of the control units were altered. All other components remained identical to the low powered standard system. Both digital 9435 receivers and mechanical 9425 receivers were used with the chain. The transmitter sites were powered by diesel generators connected to 24 volt battery banks. The standard 30 foot transmitting antenna and ground mat assembly were used. Receivers were installed into ship, launch, and helicopter platforms. A monitor assembly was located at Fort George. The baselines were of a 30 mile magnitude.

PROLOGUE

The northeastern coast of James Bay is a shoal-strewn, inlet indented piece of topography draining a portion of the Canadian Shield. Rivers and streams of varying magnitude mark their final mile into James Bay with numerous sand flats and estuary shallows. The pre Cambrian coastline is dotted with white spruce, profuse as far north as Fort George, but rapidly thinning from there to Cape Louis XIV. The coastline is generally low. Few hills surmount 200 feet of elevation. The offshore islands are generally swept bare of forest and shrub. The few sheltered areas that exist along the coast are usually reached through a labryinth of narrow channels.

James Bay protrudes thumb-like from the southern end of Hudson Bay. With a total water area of 21,000 square miles, roughly equivalent to Lake Erie and Lake Ontario combined, it is over 200 miles in length and close to 100 miles in width. Straddled between latitudes 49^{o} and 55^{o}, the bay lies across the transitional zone where arctic and temperate conditions coalesce and interact. It also straddles the geological border between the pre Cambrian development of the Canadian Shield and the paleozoic layer of the Hudson Bay plain.

Insufficient charting has taken place in James Bay. The southern end, in the Moosonee and Rupert Bay areas, has received some charting. Also, a few beach surveys have been conducted to accommodate military requirements. In the early sixties, the North Star IV did some reconnaissance work across the bay. But 90% of the bay remained an anonymous body of water.

The 1972 survey was initiated to fill an urgent requirement for charts to facilitate ship traffic into Fort

George from Hudson Bay.

A giant hydro project along 300 miles of La Grande Rivière necessitated moving thousands of tons of equipment, fuels, supplies and living quarters into the area. This could only be accomplished by large shipments from southern ports. A staging area was developed six miles up La Grande Rivière to accommodate the seaborne inflow of materials.

As with most remote stretches of water, a demand for charts usually precedes charting. Thus it was with James Bay. This shallow, shoal strewn basin was to provide an avenue for ships progressing from Hudson Bay into the Fort George area. A few reconnaissance tracks criss-crossed the bay, and these lines were closely followed by ships penetrating the bay. Often the tracks followed circuitous routes and passed alarmingly close to unknown hazards.

The charting scheme was to survey a corridor between Fort George and Cape Louis XIV, hugging the east coast as close as possible to take advantage of shoreline and island features which would provide strong radar and visual targets. (see plate I) Because of the irregular, unpredictable nature of the bottom topography, charting was planned at 1:25,000 and 1:50,000 scales. This would afford the capacity to clearly delineate hazardous areas, and define narrow chanels.

Thus the goal was defined, "to provide an access route from the southern end of Hudson Bay into La Grande Rivière." Charting would be conducted within the accuracy standards of Standing Orders 70-4. This would be realized using the modified Mini-fix system.

CHAIN INFORMATION (SEE PLATE 2)

Master Transmitter

The Master transmitter was located on Loon Island, a 500 acre chunk of land located at the mouth of La Grande Rivière. The island was treeless, yet had a profuse carpeting of reindeer moss, sedges, and small shrubbery, overlaying its granitic structure. The transmitter antenna was erected over a control point on the highest point of the island (60 feet elevation). (see plate 3).

Slave I

The transmitter antenna for pattern I was located on the highest point of Walter Island. (see plate 4). Walter Island is a moss carpeted feature, with 100 feet of elevation, lying 25 miles off the coast. The island had been controlled by trilaterating from coastal points. An unobstructed water path lay between this transmitter and the master transmitter.

Slave II

The transmitter for slave II was located over a control point at Attiquane Point, approximately half way between Fort George and Cape Louis XIV (see plate 4). The topography at this site was roughly moulded granitic rock, supporting sparse vegetation. Strong offshore storms could thrust water and spray across this terrain. The transmitter was at an elevation of 30 feet, and the ground mat spoked outward along a bare rock surface. Between the Master transmitter and

Slave II, the direct path is broken, especially at low tide, by numerous sand bars and shoaling areas. At high tide, approximately 5% of the baseline is intersected by land fingers stretching seaward.

POWER SUPPLIES

The Mini-fix transmitter units required 3.5 amperes of current at a 24 volt pressure.

The 24 volt pressure was established from two standard 12 volt 70 ampere/hour auto batteries connected in series.

The 24 volt battery bank was continuously charged using three systems:

1) At the slave sites, Petter 3.5 h.p. diesel units, coupled to Niehoff 24 volt 35 ampere alternators were employed (see plate 5). 6. In order that the diesel could run continuously unattended, it was fitted with a six quart base oil sump, and a pressure activated solenoid cut out switch. Thus if the oil pressure dropped below a certain pressure, the switch was automatically tripped and this shut off the engine.

The Niehoff alternator was coupled directly to the main shaft of the diesel. A voltage regulator and ampere gauge completed the electrical system.

The complete unit (batteries, diesel and electrical equipment) was housed in a compact, ventilated plywood structure. This prevented rain or stray animals from coming in contact with the system. (Plate 6)

The diesel would run for 15 days unattended on a 45 gallon drum of fuel. This is recommended as the longest period the system should be left prior to a general inspection and maintenance. Usually after 15 days, the sump was becoming low on oil.

2) The Master transmitter battery bank was charged by a standard battery charger connected to a 115 volt source supplied by 2.5 h.p. Kohler diesel plant. (see plate 3). Now why a Kohler, which weighed over 400 pounds as compared to a Petter which weighed about 100 lb? At Loon Island a water level telemetry system has been installed which required 115 volts. The inverters which we possessed could not keep up with the current requirements of the telemetry system if a 24 volt Petter system were to be used, and so to "kill two birds with one stone", a Kohler 2500 watt power unit was installed, and it easily furnished enough power for both the telemetry and Mini-fix transmitters. It is of interest to note that no interaction was evident between the telemetry transmitter (40.56 MHz) and the Mini-fix transmitter (1702 KHz).

The Kohler diesel would operate for 10 days unattended on a 45 gallon drum of diesel fuel.

3) The northeastern coast of James Bay has for centuries been a favourite goose hunting area for the local Indians. In spring and fall, their decoys and hunting canoes were as regular as the migrating birds. The drying marshes, the shallow ponds, and the clusters of sedges, mosses and lichens which blanket the undulating coast provide natural feeding and resting areas for the migrating geese.

Since time began, the Indian hunter has known no noise along this coast, save the rustling of bushes, the slapping of surf, and the flapping of feathered wings. The coast remains unspoiled and untouched by outside influences. Thus, his ears reacted sharply when an unknown diesel clatter resonated from Pointe Attiquane, the site of Slave II. Also, his natural instincts told him that such an artificial noise would surely frighten away temporarily, if not forever, the normally plentiful geese. His fears were conveyed to the local Indian Chief, who through an intermediary advised us of the problem.

So that is when the third power system came into play. We had on stock three Telan 50 watt propane generators. One generator was insufficient to keep the batteries charged -- the transmitter drew 80 watts of power. Thus, two generators were connected in parallel, rigged to double propane banks and activated. In the north, propane is an inefficient source of fuel. The natural cool environment reduces severely the useable propane from a pressurized cylinder. In addition, it is a delicate and volatile product to transport by air. Nevertheless, we moved propane into Attiquane Pointe and placed four bottles in tandem to drive the generators. Two propane bottles operated a generator approximately 10 days. The greater efficiency of the thermocouples in cold weather was more than offset by the reduction in pressure in the propane bottles.

Slave II was operated for five weeks using a diesel power source, and five weeks using a propane power source.

MONITOR STATION

The monitor site was located at Fort George, approximately five miles up river from the Master transmitter (see plate 2). The direct path from the monitor antenna to each transmitter crossed about 5% of land path.

A digital receiver was paralleled to a Hewlett-Packard two-pen strip chart recorder to afford either spot or continuous records of the pattern performance.

The system operated from a 110 volt charged, 24 volt battery bank.

The antenna was mounted at a height of 35 feet, away from electrical noise and ferrous influences.

The performance of the system was established by closely tracking deliberate pattern shifts, i.e. adjusting the slave gonios and simultaneously watching the monitor pattern shift.

The infusion and recession of the tide (general range 4 feet) did not effect the monitor pattern read-out. Local rain squalls, often isolated along one base-line, gave a pronounced indication of pattern shift. Also, a heavy general downpour caused both patterns to change.

Pattern shifts due to meteorological variables never amounted to more than ±.10 lane.

A general drift of the pattern, often caused by control unit components stabilizing, was not noticeable.

The monitor equipment was set up in a hydrographic office parcoll where erratic or unusual shifts could be closely watched.

Helicopter Installation

A Bell 206A helicopter was used to phase, calibrate, and maintain the Mini-fix system (see plate 3). A retractable antennae system (see plate 6) was mounted onto the helicopter strut. The antenna could be lowered to a vertical position when the helicopter was airborne, and raised to a horizontal position for landing. Extended full vertical, the helicopter was restricted to 60 knots. As the angle approached a horizontal, the speed of the helicopter could be increased. The unit was inspected and certified by M.O.T. prior to installation.

A receiver was mounted into the helicopter directly in front of the port front passenger seat. This allowed the passenger technician to continuously read the receiver and monitor the incoming signal strength. In addition, the pilot could see the display.

Power for the receiver was taken directly from the 24 volt helicopter system.

A warning light device indicated the position of the retractable antenna. To further facilitate the pilot, a regular truck mirror was secured below the forward part of the bubble canopy, and this allowed the pilot to physically see the antenna.

Chain Activation

The chain was activated in early July. This was one month prior to the ship entering James Bay; however, it was determined as necessary to validate the chain's feasibility prior to committing the system to specific requirements.

The winter ice had not completely left James Bay at that time. Slave I baseline was 25% ice covered (rotten ice). Slave II baseline was ice free except for wind carried fragments.

The chain was activated, and immediately gave promising results. Metered AGC readings at either slave indicated a 6.5 strength. This was almost double the strength suggested as necessary for trouble free phase locking.

Range tests using the helicopter showed position locking (strength 4 on the AGC meter) on both patterns at a range of 100 miles from the furthest transmitter. A maximum locking range could not be determined due to range limitations on the helicopter but it is possible and probable that lock could have been held for 200 miles.

The ice along pattern I baseline failed to attenuate or distort the ground wave signal. Similarily, no noticeable pattern shift or distortion could be determined along pattern II baseline where the signal was generated across flooding and drying flats.

At monitor a strong AGC 6 signal was read from each slave, and chart tracking of both patterns commenced and continued under a stable signal.

Phasing and Calibration

The chain was phased by conducting a number of Master baseline crossings, and adjusting the slave goniometers to accommodate a zero reading at Master.

This method afforded two important results. Firstly, a lane count could be taken on both patterns to accurately determine the baseline propagation velocity. Secondly, the lattice which was computed on an assumed velocity would remain highly accurate in the area of Master, i.e. the crucial charting zone.

All readings were taken with the helicopter at an elevation of 200 feet or lower. Baseline extension crossings were taken at one mile increments from the transmitters, until consecutive readings remained identical. This accounted for the induction distortion error. An induction deviation of .06 lane was observed at one mile from the transmitter. This value slowly decreased until at seven miles and beyond extension values remained identical.

At the times of baseline extension crossings, the monitor values were recorded. These values were used as references during the Master zeroing process.

Once the lane counts had been completed, it was possible to compute a mean baseline propagation velocity for each pattern. Pattern I lane counts meaned out to 739.75 which gave a propagation velocity of 299,555.672 km/sec. Pattern II lane counts meaned to a figure of 664.60, which gave a propagation velocity of 299,551.667. Thus a mean propagation of 299,553.67 km/sec. was projected for the area. The propagation velocity along the pattern II baseline, may have been slightly slower than along pattern I baseline, due to the proximity of the coastline and intermittent drying areas.

Once the lane counts were completed, and a monitor value established to hold the Master station to a zero value, calibration of the chain was initiated.

This was accomplished by hovering over established control points with the helicopter, and comparing observed values with computed values. Seventeen control points were interrogated. (see plates 10 and 11).

The results are naturally not only a function of the propagation velocity along the paths between the receiver and the transmitters, but also a function of the ability of the helicopter pilot to hover directly over a point and the stability of the receiver itself.

Points were interrogated at distances up to 80 miles from a transmitter. On the basis of a baseline established propagation value, deviations between observed and computed values were always less than .10 lane.

To supplement the helicopter work, the ship and the launches made a number of baseline crossings. These crossings compared favourably with values determined from the helicopter crossings.

Sounding Techniques

Receivers were mounted into the ship CCGS NARWHAL and three launches, to accommodate sounding procedures. (see plates 7-9)

Six reference buoys were positioned to afford easy referencing checks for launches entering and returning from the sounding area. An established practice incorporated setting the proper lane figures on at one buoy and then proceeding to another buoy, where the Mini-fix position was noted and compared to the correct value. Such a system acted as a double check and thus insured a proper lane setting prior to sounding. At the conclusion of sounding, a similar dual check was taken.

Across the proposed sounding area it was possible to run along one pattern and fix at pre-determined lane intervals of the second pattern. Lines of a 40 mile length were standard. Thus a launch capable of sounding at 10 knots could, in one day, run seaward along one lane for 40 miles, move across to an adjacent lane, and return to the anchorage on this lane. Usually the three launches proceeded together at three mile separations. The proximity of one to another allowed quick cross-referencing, if one launch suspected a loss of lock and subsequent lane count interruption.

Except in emergency, the standard MF/HF radio-telephones on the launches could not be used. Transmitter radiation at this frequency range, induced signal noise into the Mini-fix signal, and thus caused the receivers to jump lanes. This effect was not apparent using VHF equipment.

The Mini-fix receiver on the ship was set correct by launch reference, baseline crossings and helicopter reference.

The launch reference method was the simplest in that the launch would move in abreast of the ship antenna, and radio his particular reading. It would then proceed to the opposite side of the ship and radio in a reading again. The ship's receiver value was compared with the mean value of the two launch readings. It was necessary that the launch remained outside the influence of the ship's hull during this procedure. Once the receiver on the ship had been set correct a further confirmation was achieved by baseline crossings, which were normally made as the ship manoeuvred in and out of the anchorage area. Helicopter referencing was a highly mobile method of checking or re-setting the receiver at any point on the bay. The helicopter would set up its own receiver at a convenient control point, fly out to the ship and hover over the ship's Mini-fix antenna, and radio down his readings. A confirmation would then be made of the helicopter receiver, and a check hovering conducted.

Normally, the Mini-fix receivers on the ship and launches would be left on standby during idle periods. As a cold receiver often takes one-half hour of warm up prior to "locking in" on the signal, it was advantageous to leave the receivers on continuous standby heating.

The antennae aboard the Bertrams were at a terminal elevation of 15 feet above the waterline. The antenna on the SURGE had an elevation of 18 feet. In both cases, signal strength was adequately manifested to allow stable locking 60 miles from a transmitter. The receiver on the SURGE, using a slightly higher antenna, showed AGC values slightly higher than either Bertram.

Lattices

Hyperbolic lattices were drawn up using an assumed propagation velocity of 299,600 km/sec.

The lattice construction was expedited on a Gerber 22 flat-bed plotting table interfaced to a PDP-8/I computer. A program wrote by the Development Section of Central Region regulated the process.

Observations and Conclusions

(I) The "beefed-up" Mini-fix system adequately met positioning and range requirements for the survey in James Bay. Substantial signal strength was evident across the total north half of the bay. Locking strength could probably be carried in excess of 100 miles from the farthest transmitter.

(II) The Petter diesels proved a reliable source of continuous power for the chain. The units could be transported either inside the cargo compartment of a Bell 206A helicopter, or they could be moved in the normal net slinging fashion. The 6 quart oil sump and the 45 gallon fuel drum provided enough consumables to allow up to 15 days of unattended operation.

(III) Phasing, lane counting, and calibration procedures provided an adequate system of chain evaluation. The monitor at Fort George was able to track pattern shifts and drifts.

(IV) The helicopter mounting was an indispensible aid in both evaluation and implementation procedures. Calibration by hovering over control points; baseline extension crossings to effect a zeroing error or a lane count; plus a referencing capacity to afford ship operation flexibility -- all contributed significantly to an efficient use of the chain.

(V) Signal strength on all sounding platforms was adequate to sustain horizontal control across a 60 mile radius from Master transmitter. It appeared that an antenna should be elevated 20 feet or more above the water surface, to obtain the best AGC readings on a receiver.

(VI) The propagation properties of the atmosphere, water surface (12 PPT average salinity) and topography (granite over-laid with moss)were ostensibly agreeable to the Mini-fix frequency (1702 KHz).

(VII) Driving rain storms, on one occasion, penetrated a base coil causing temporary damage. It was necessary to anchor and shield as much equipment and wiring as possible. Tremendous lightning storms prevail during the summer months in James Bay. Therefore, it is wise that all transmitters be adequately grounded.

(VIII) The major drawback of the Mini-fix system is that it lacks a lane-identification feature. This has to be surmounted by positioning numerous buoys or by using a launch or helicopter referencing system. Once the buoys are anchored, the helicopter can quickly ascertain their correct position and run intermittent checks on their stability.

EPILOGUE

The reader is probably asking why calibration was not conducted in the normal precision fashion of theodolite cuts to a survey platform.

The simple answer is that it was superfluous to our requirements. By this, it is implied that taking all probabilities into account, the helicopter calibration would be adequate to insure a horizontal displacement of less than 1 mm at the survey scale.

All charting, except of the area immediately seaward of Master where lattice expansion was minimal and hyperbolae cuts strongest, was conducted at a 1:50,000 scale.

At this scale, 1 mm = 50 metres. On a baseline, one lane = 88 metres. Therefore it can be seen that a 1 mm linear displacement along a baseline would equal greater than a .5 lane error. As the patterns expand, and as lane intersections embrace smaller angles, a baseline pattern error naturally creates a proportionately larger displacement.

At the outermost position of the survey, we experienced a 4X expansion on Pattern I, and a 3X expansion on Pattern II. This was the greatest expansion factor experienced, and also the weakest angular intersection of the two patterns. Using a diamond of error hypothesis, an error of .10 lane on each pattern at this at this point would create a 1 mm position shift at the survey scale.

This shift would occur only when both patterns deviated unknowingly .10 of a lane. Receiver instability or pattern fluctuations unaccountable at the monitor site would create such a condition. In most cases of pattern instability the monitor recorder would clearly indicate a shift which could be applied to recorded launch values.

On the basis of chain performance, and past experience, a double shift of .10 lane was unlikely. However, our charting geometry afforded this latitude as accuracy insurance.

If the helicopter calibration had not interrogated control points in which the transmitted signals had to cross the waters subject to charting, the results would have only partially validated the chain parameters. Since it was possible to calibrate points not only close to the coastline, but as far as 50 miles off shore, a strong evaluation of the chain *in toto* was possible.

The helicopter method of phasing and calibrating is a fast, efficient system which obviates the normal water craft procedures. Much evaluation remains, to determine deviations caused by the helicopter attitude or altitude. On survey scales of 1:25,000 or larger, it should be used with caution. However, if numerous control points exist around the perimeter of a proposed Mini-fix chain, the helicopter can provide enough data to obtain conclusive results on a radiated pattern.

Bruce Wright
February 2, 1973

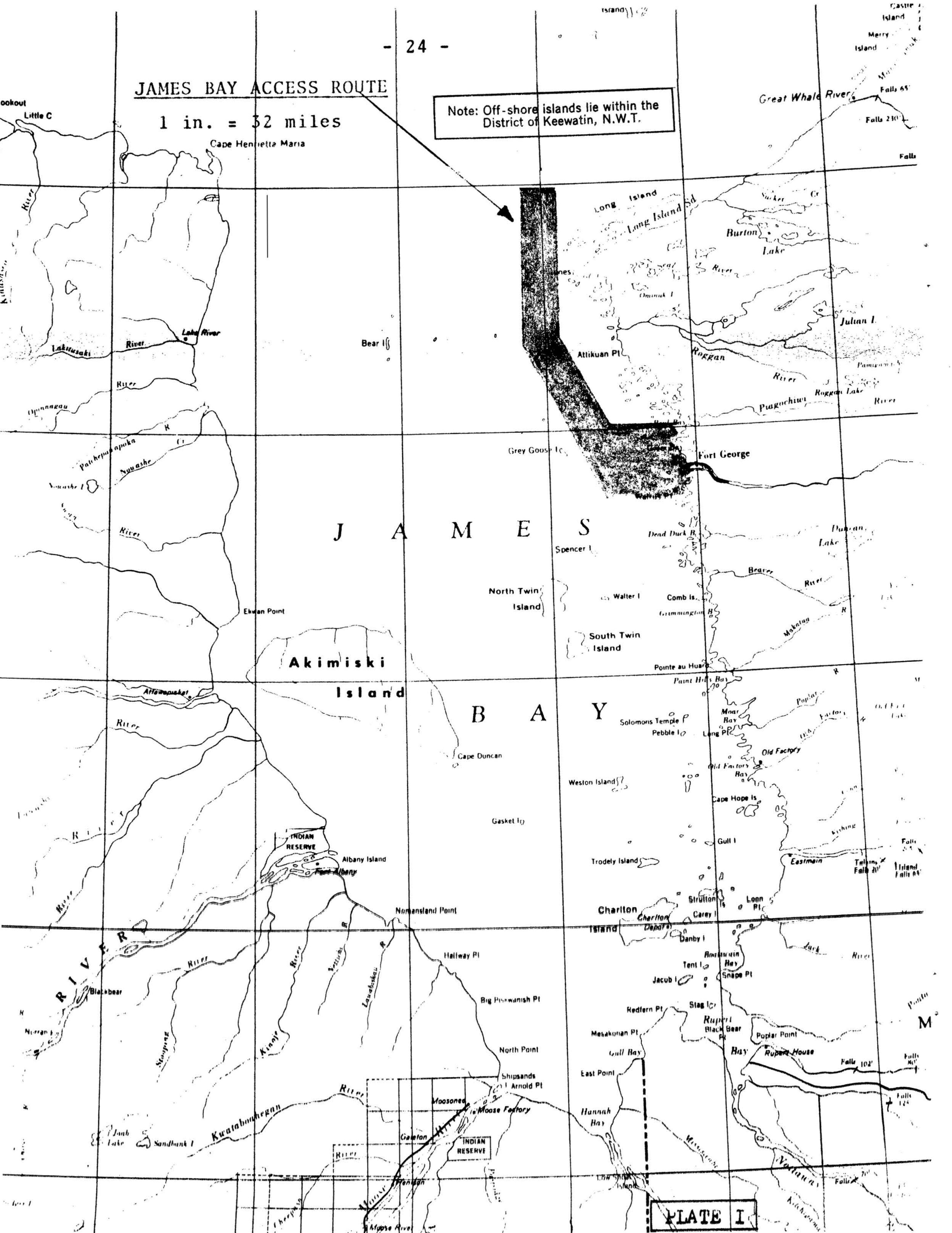
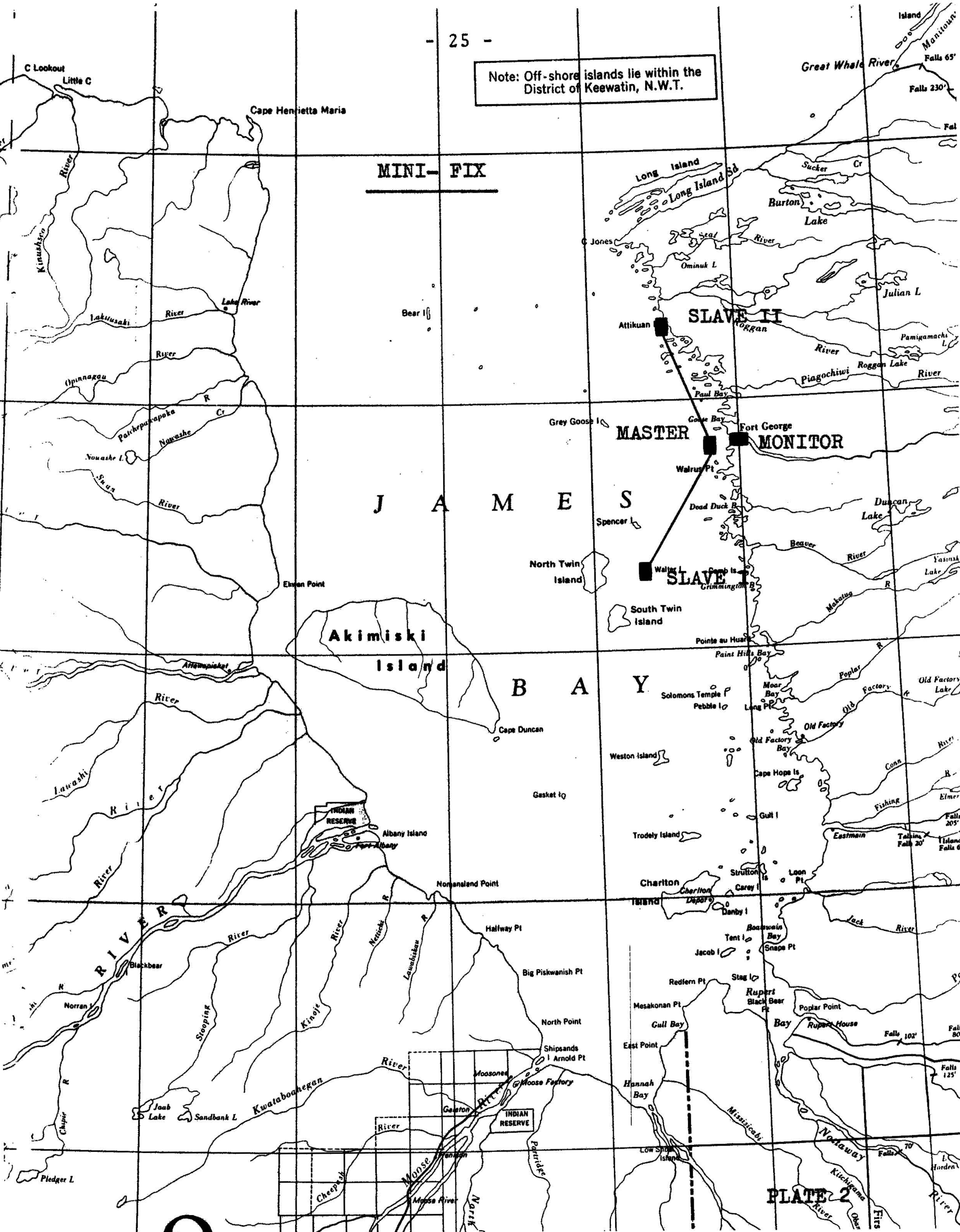
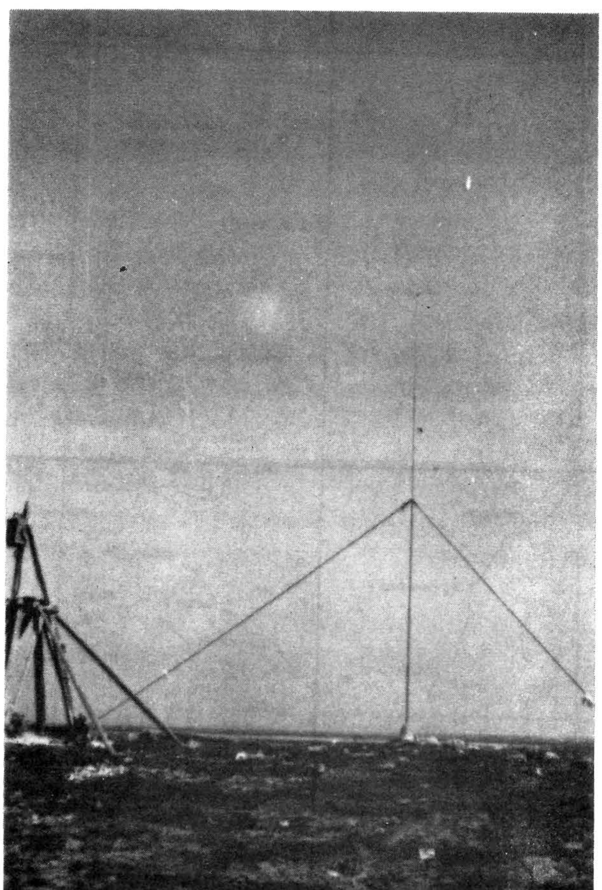

JAMES BAY ACCESS ROUTE
1 in. = 32 miles
Note: Off-shore islands lie within the District of Keewatin, N.W.T.
Cape Henrietta Maria
Great Whale River
Long Island
Long Island Sd
Burton Lake
Julian L.
Attikuan Pt
Roggan River
Bear I
Grey Goose Is
Fort George
Lake River
J A M E S
B A Y
Spencer I
North Twin Island
Walter I
Comb Is.
South Twin Island
Ekwan Point
Akimiski Island
Attawapiskat
Pointe au Huard
Solomons Temple
Pebble I
Long Pt
Old Factory
Cape Duncan
Weston Island
Cape Hope Is.
Gasket I
Gull I
Trodely Island
Eastmain
INDIAN RESERVE
Albany Island
Fort Albany
Nomansland Point
Charlton Island
Charlton Depot
Carey I
Danby I
Strutton Is
Halfway Pt
Tent I
Jacob I
Snape Pt
Big Piskwanish Pt
Stag I
Redfern Pt
Rupert Bay
Black Bear Pt
Poplar Point
Rupert House
Mesakonan Pt
North Point
Gull Bay
East Point
Shipsands
Arnold Pt
Moosonee
Moose Factory
Hannah Bay
Kwataboahegan River
Sandbank I
Blackbear
R I V E R
Moose River
Low Bush Island

PLATE I


Note: Off-shore islands lie within the District of Keewatin, N.W.T.
MINI- FIX
SLAVE II
MASTER
MONITOR
SLAVE I
PLATE 2
JAMES BAY
Akimiski Island
Cape Henrietta Maria
C Lookout
Little C
Long Island
Long Island Sd
C Jones
Attikuan
Bear I
Grey Goose I
Fort George
Walrus Pt
Goose Bay
Paul Bay
Dead Duck B
Spencer I
North Twin Island
South Twin Island
Walter I
Comb Is
Grimmington B
Ekwan Point
Pointe au Huard
Paint Hills Bay
Solomons Temple
Pebble I
Long Pt
Moar Bay
Old Factory Bay
Cape Duncan
Weston Island
Cape Hope Is
Gasket I
Gull I
Trodely Island
Albany Island
Fort Albany
INDIAN RESERVE
Nomansland Point
Charlton Island
Charlton Depot
Strutton Is
Carey I
Danby I
Loon Pt
Boatswain Bay
Tent I
Jacob I
Snape Pt
Stag I
Redfern Pt
Mesakonan Pt
Gull Bay
Rupert Bay
Black Bear Pt
Poplar Point
Rupert House
East Point
Hannah Bay
Halfway Pt
Big Piskwanish Pt
North Point
Shipsands I
Arnold Pt
Moosonee
Moose Factory
Moose River
Low Bush Island
Blackbear
Norran I
Joab Lake
Sandbank L
Kwataboahegan
Pledger L
Great Whale River
Burton Lake
Seal River
Ominuk L
Julian L
Roggan River
Roggan Lake
Piagochiwi River
Duncan Lake
Beaver River
Makatua R
Poplar R
Old Factory R
Old Factory Lake
Eastmain
Jack River
Missisicabi
Nottaway
Kitchigama River
Lake River
Lakitusaki River
Opinnagau R
Patchepawapoka Cr
Nowashe L.
Swan River
Attawapiskat River
Lawashi River
Kinoje
Stooping
Lawabiskau R
Nettichi R
Partridge
Cheepash
Chipie R
Kinushseo River

MINI - FIX OPERATIONS , JAMES BAY, 1972

Kohler diesel generator, Master transmitter, Loon Island

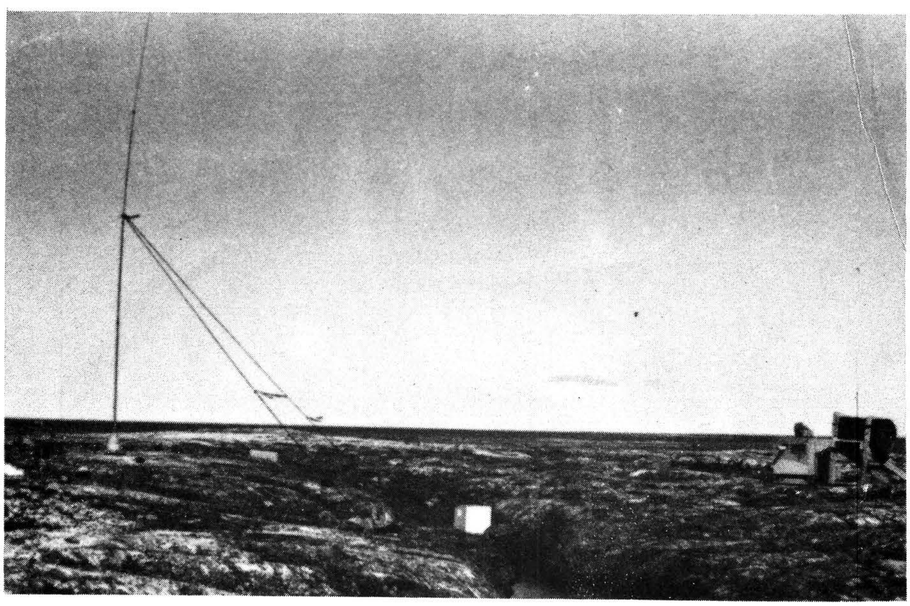


Master transmitter , Loon Island

PLATE 3

MINIFIX OPERATIONS, JAMES BAY SURVEY, 1972

SLAVE 1, WALTER ISLAND



SLAVE 11 , ATTIQUAN POINT

24 volt Power Source , James Bay Survey

3 H.P. PETTER DIESEL COUPLED TO
24 VOLT NIEHOFF ALTERNATOR

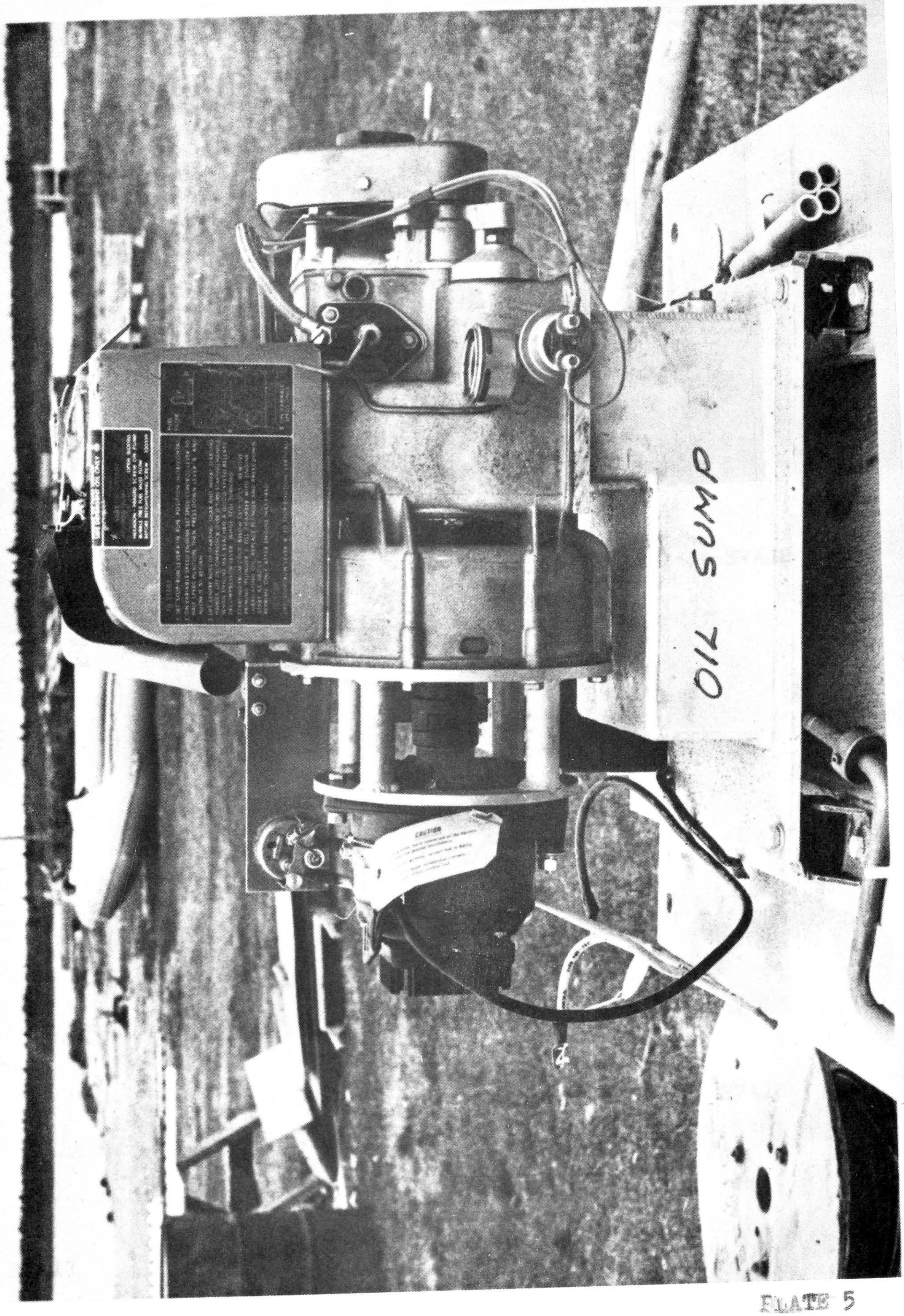
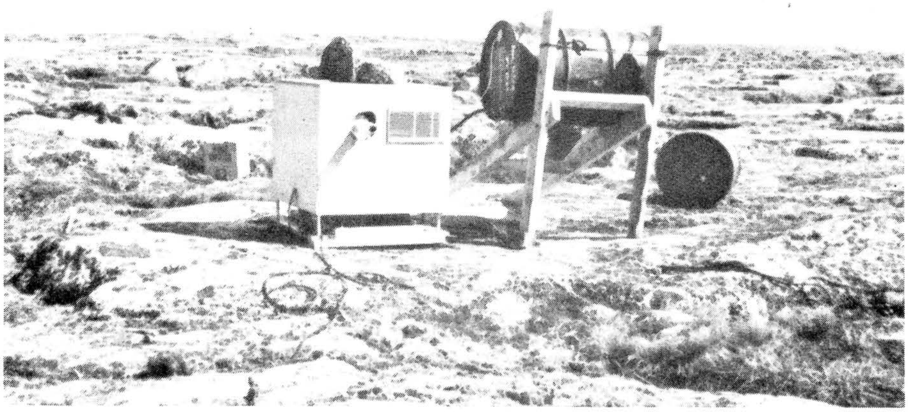
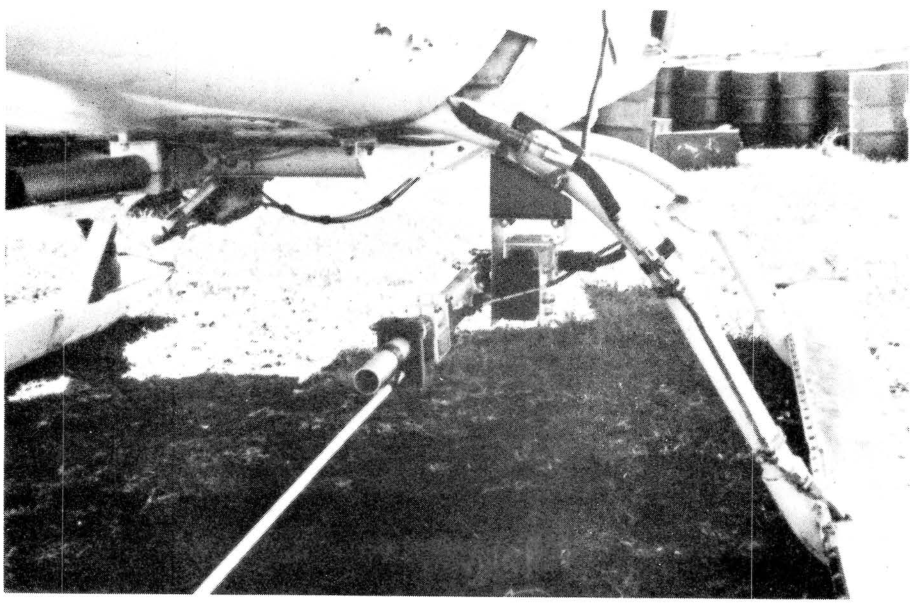


PLATE 5

MINIFIX OPERATIONS , JAMES BAY SURVEY, 1972

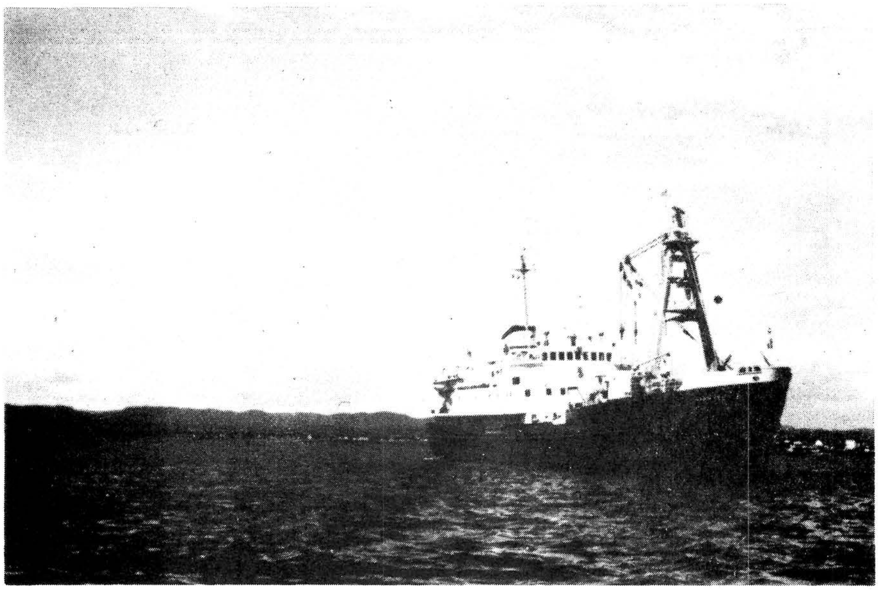


24 volt diesel generator system on site

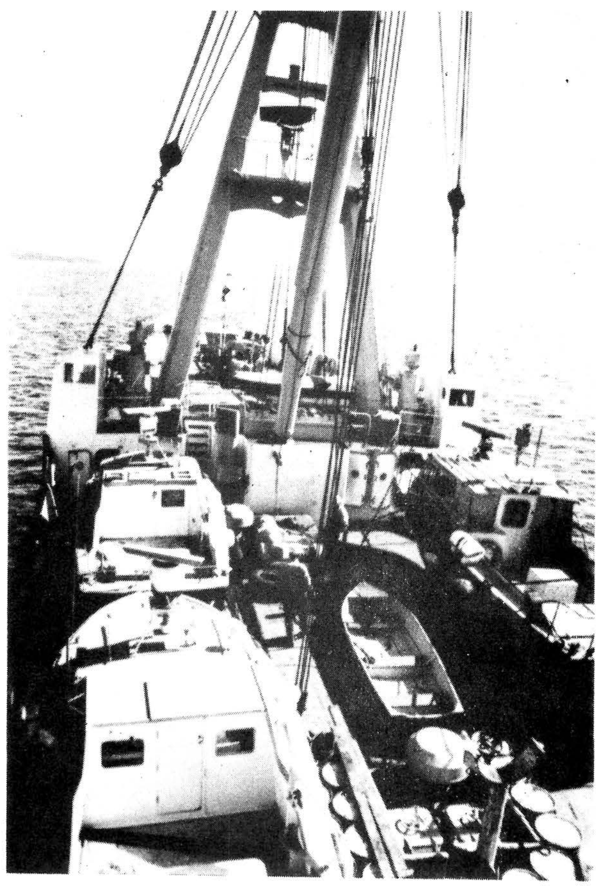


retractable Mini-Fix antenna mounted on helicopter strut.

PLATE 6



250 ft. C.C.G.S. NARWHAL

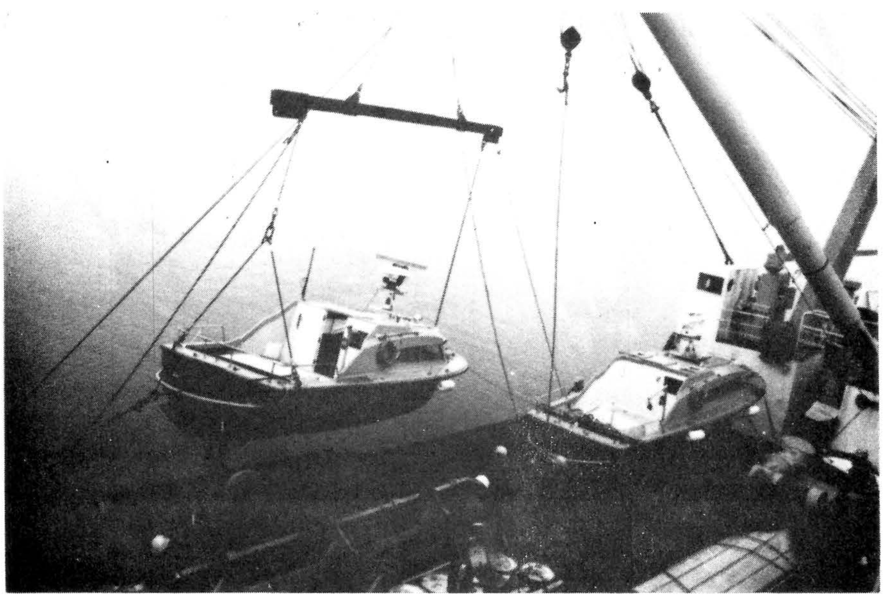


Deck cargo of launches heading north

PLATE 7

LAUNCHES - JAMES BAY SURVEY

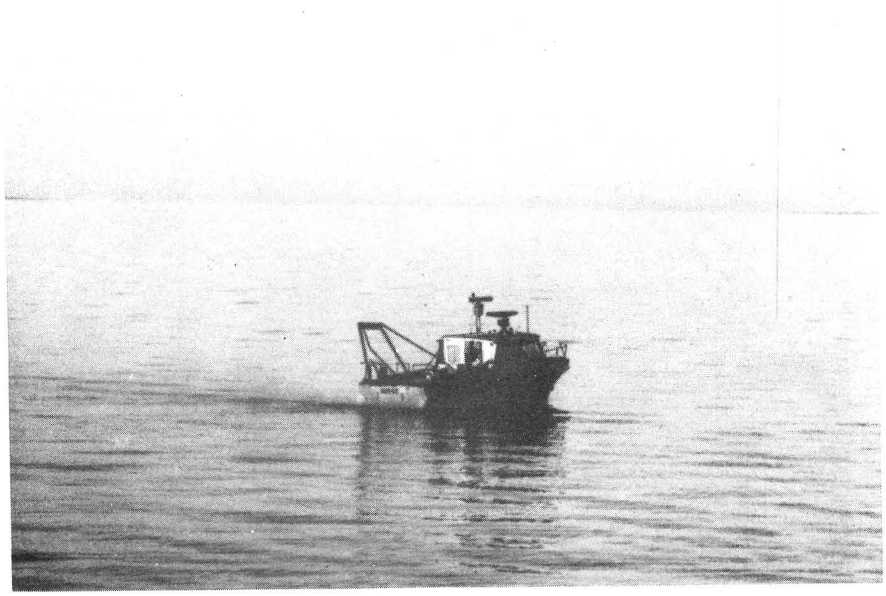
Diesel Powered , fibreglass hulled, 25 ft. BERTRAM



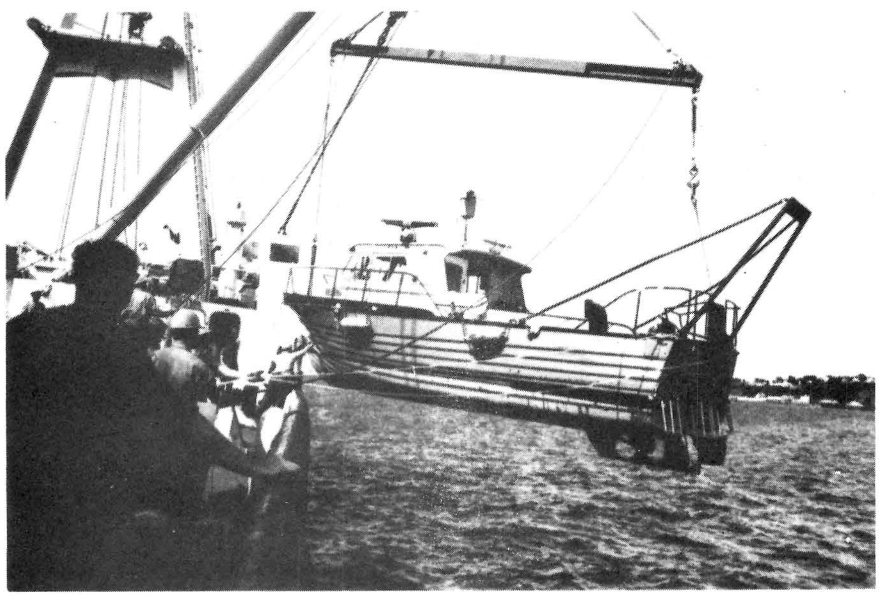
Hoisting a BERTRAM launch

PLATE 8

LAUNCHES - JAMES BAY SURVEY



36 ft. Diesel Powered , steel hulled SURGE



Using a bar spreader to lower SURGE

PLATE 9

MINIFIX CALIBRATION POINTS - 1972

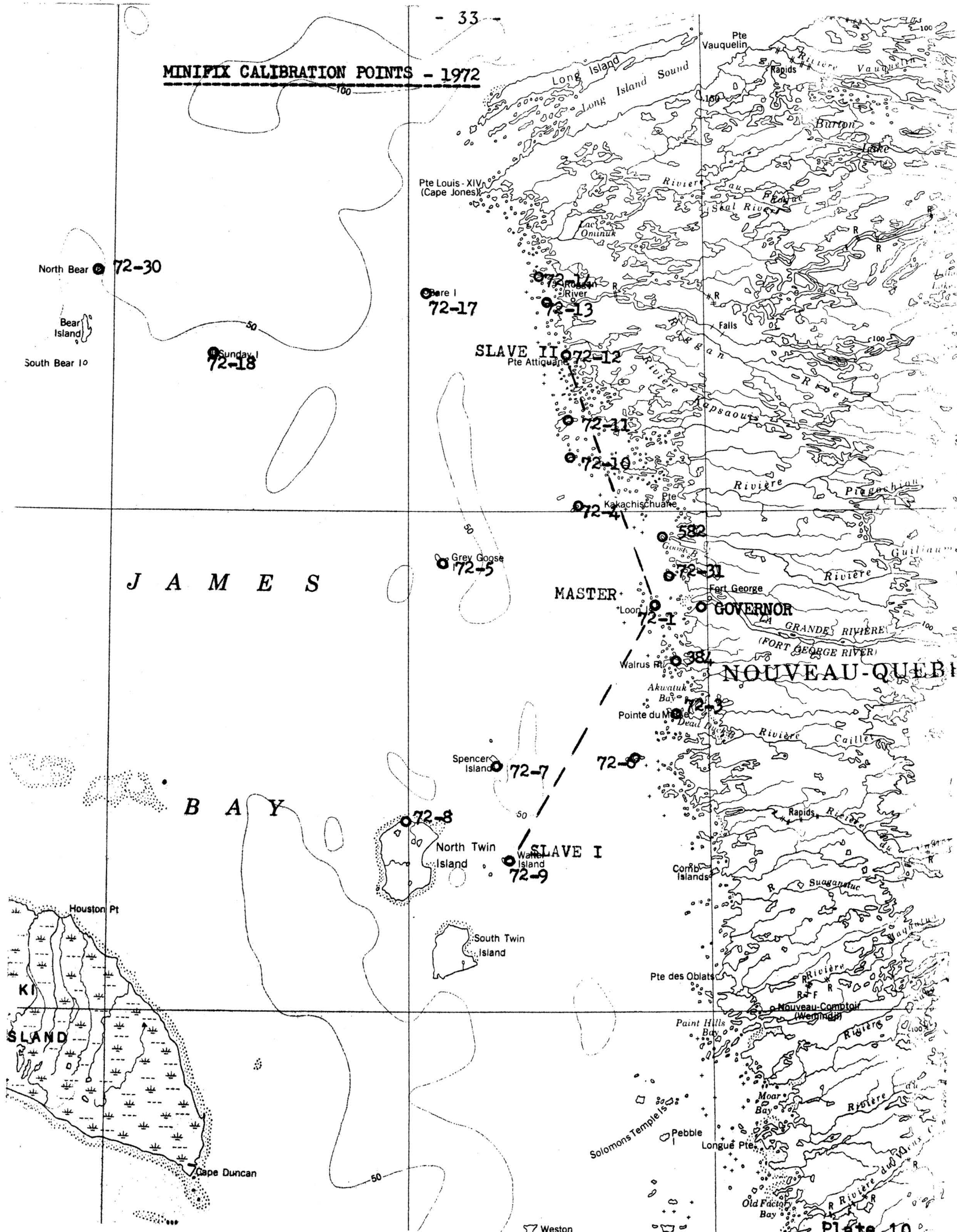


Plate 10

MINIFIX CALIBRATION - 1972

Control Point	Observed		Computed		Residual	
	Patt I	Patt II	Patt I	Patt II	Patt I	Patt II
72-1	Master Transmitter					
72-3	225.31	01.06	225.33	00.98	-.02	+.08
72-4	72.13	314.70	72.11	314.71	+.02	-.01
72-5	258.98	306.63	259.03	306.60	-.05	+.03
72-6	351.87	13.69	351.95	13.67	-.08	+.02
72-7	526.72	94.78	526.80	94.70	-.08	+.08
72.8	639.52	132.87	639.52	132.84	NIL	+.03
72-9	Slave I Transmitter					
72-10	72.25	424.38	72.19	424.33	+.06	+.05
72-11	65.33	512.02	65.32	511.98	+.01	+.04
72-12	Slave II Transmitter					
72-13	68.48	664.02	68.42	664.07	+.06	-.05
72-14	71.59	664.22	71.53	664.29	+.06	-.07
72-17	133.81	629.72	133.76	629.77	+.05	-.05
72-18	275.90	419.39	275.83	419.40	+.02	-.01
384	110.94	00.12	110.90	00.11	+.04	+.01
GOVERNOR	25.29	35.78	25.26	35.82	+.03	-.04
582	5.75	160.43	5.69	160.51	+.06	-.08
72-30	280.36	555.48	280.42	555.58	-.06	-.10
72-31	0.57	64.00	0.57	64.05	NIL	-.05

Plate 11

Lane Count Method of Determining Propagation Velocity

(1) Conduct master baseline extension crossings at incremental distances until the minimum recorded readings are constant. Note time of crossing for monitor reference. At the lowest reading, both patterns should read 000 lanes plus a fraction.

(11) Conduct slave extension crossings by intersecting the extension - ie. imaginary extension of a line drawn from master through the slave - at increments until the maximum recorded readings are constant. Do this at both slaves. If done by helicopter, insure that the flying elevation is constant at all transmitter locations.

(111) Fly or travel back to master and check that the master extension crossings read identical to the 000 plus a fraction read initially. If the reading is not identical, the monitor recorder should provide a shift correction.

(1V) From the total lane count of each pattern, subtract the lane fraction recorded on the respective extension at master. This will give the full lane count of each pattern.

(V) Then:

$$\text{Lane width} : \frac{\text{baseline length (geographic in metres)}}{\text{baseline count}}$$

Mean propagation velocity : lane width x 2 x pattern frequency.

or

$$V_{pm} : \frac{B_1 \times 2 \times P_f}{Bc}$$

where

V_{pm} : mean propagation velocity for baseline in kilometres/sec.

B_1 : baseline length in metres

P_f : pattern frequency in kilohertz

Bc : baseline count to closest hundredth of a lane.

APPENDIX I

Calibration Using a Helicopter Hovering Technique

(1) Select third order or better control points within the proposed area of charting. The helicopter can move quickly from one point to another, so take as many readings at different points as possible.

(11) By adjusting the slave goniometers, bring master to read exactly zero. This is confirmed by baseline crossings at master. When master is at a zero value, note the readings at monitor. All future corrections will be made on the basis of deviations from this value.

(111) Set the helicopter receiver on the correct lanes by either hovering over a pre-calibrated control point, or setting the lane counters on zero along the master extensions.

(1V) Hover over the control points, recording the time and mini-fix values of each point. The ability of the helicopter pilot to hover directly over a point will decide whether it is necessary to mean a number of hoverings on the same point. It is noted that it will be necessary to hover momentarily so that any receiver lag is eliminated. The hovering elevation should be as low as possible (ie. 20 feet) with the antenna extended fully vertical.

(V) After the control points have been interrogated, reduce the values to a zeroed master reading.

(V1) Use the lane count propagation value for all computations.

The computed reading for a point is determined from the following formula:

$$r : \frac{ms + (a-b)}{\lambda}$$

where: r : pattern reading in lanes

ms : baseline length in metres

a : distance from point to master in metres

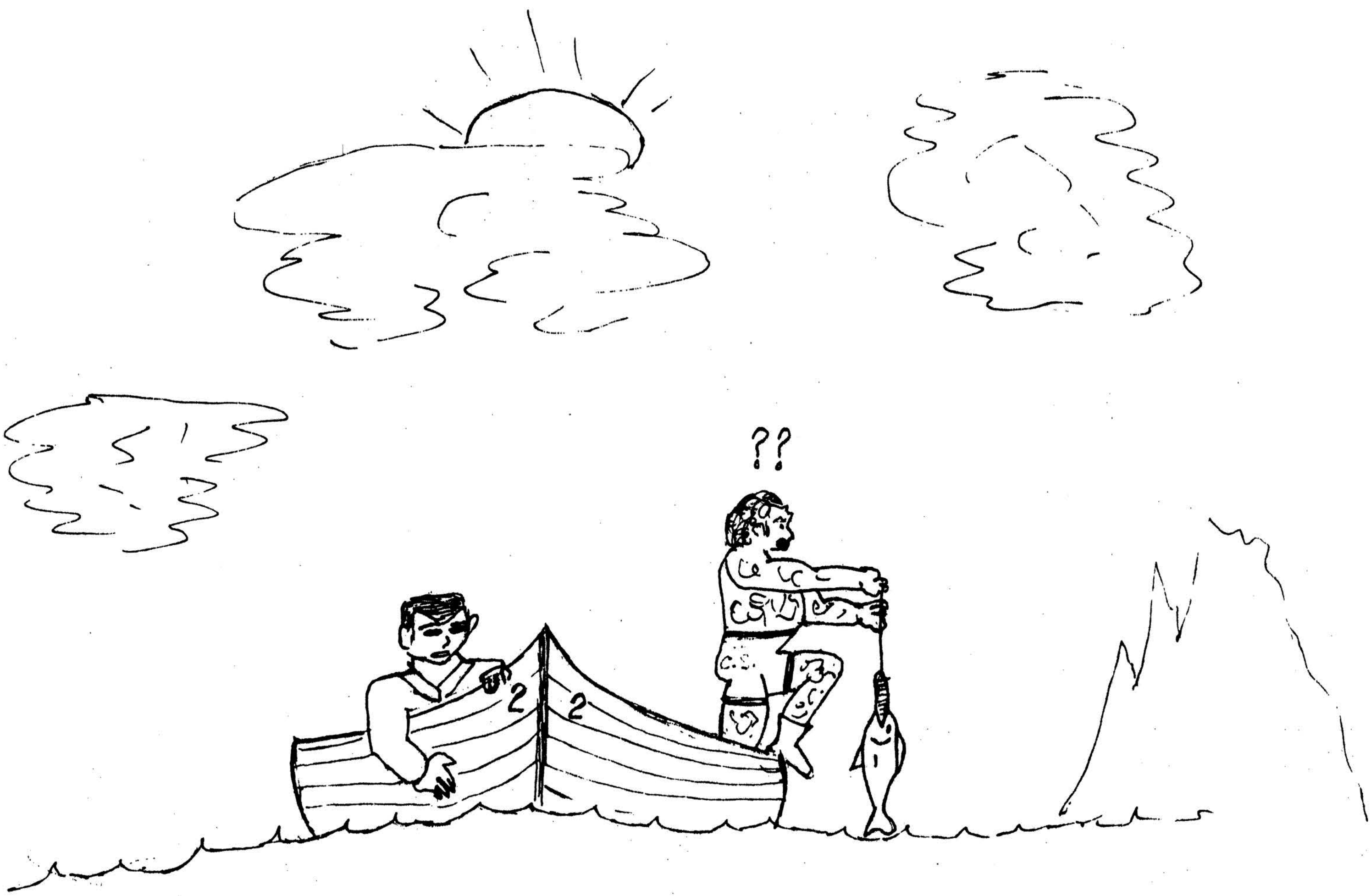
b : distance from point to slave in metres

λ : wavelength : $\frac{\text{mean propagation velocity*}}{\text{pattern frequency}}$

APPENDIX II

* obtained by meaning propagation velocities for each baseline.

Note: All distance values are in true geographic metres.



What are you getting
on the lead ??

THE SECOND INTERNATIONAL OCEAN DEVELOPMENT CONFERENCE AND EXHIBITION, TOKYO

The oceans remain one of the few areas that are relatively untouched as far as resource development is concerned, although the tempo of ocean development has increased dramatically during the last decade. The purpose of this ocean development conference and exhibition was to promote and enhance the international technical interchange of ideas, methods and technology in the sphere of ocean development. The conference and exhibition were held in Tokyo from October 4-9, 1972.

The Marine Sciences Directorate of DOE was asked to participate in two ways. First we were invited to send speakers and delegates to the Conference; second we were approached by the Department of Industry, Trade and Commerce and asked if we could send a Canadian scientific ship to participate in the Exhibition.

For the first request, there was little problem. Dr. Sus Tabata and myself submitted papers and both were accepted for presentation at the Conference. The second requirement, ship participation, was more difficult to rationalize and to fulfil.

However, after careful consideration we concluded that the Canadian scientific ship PARIZEAU, based in Victoria, could participate in the Exhibition without undue costs to the Canadian tazpayer, and with little disruption to the planned scientific program. PARIZEAU was originally scheduled to carry out survey operations in the Western Arctic during last summer and, on completion of the program in mid-September, would then return to Victoria. By routing her home from Pt. Barrow, Alaska, via Tokyo, rather than the direct route, an additional 4,000 miles of steaming was involved. This may seem like a rather long detour; however, to offset this extra mileage a trans-Pacific chemical oceanographic program, to be conducted from Tokyo to Victoria, was planned.

At the Conference over 180 papers were presented by various authorities from 22 countries. About 1,000 people registered representing 35 nations. Topics of papers presented ranged from the theoretically scientific through to the pragmatically industrial with all shades of variation between. To give some indication of the scope of the Conference session titles included "Marine Environment", "Research and Survey of Oceans", "Submersible Research Vehicles", "Marine Structures" and "Marine Resources".

Some indication of North American interest in this Conference may be garnered from the fact that there were 34 papers presented by speakers from the United States and 14 by Canadians.

Three sessions were run concurrently during the three days of the Conference. Simultaneous translation, Japanese-English or English-Japanese was provided for all sessions.

The organization throughout was excellent. Sessions commenced and finished on schedule. The meeting halls were large, had good acoustics and, most importantly, the chairs were soft enough to be comfortable and yet hard enough to keep you awake.

Although the Japanese are keenly interested in the exploitation of the world's oceans in every economic sense, it is quite apparent that they are also deeply concerned about the environmental aspects of this potential development. We were asked many times about our pollution problems and what we are attempting to do about them. Tokyo is a prime example of uncontrolled industrial development. The air and the water are extremely polluted. It is quite common to see pedestrians in the streets of Tokyo with gauze masks across their faces attempting to obtain some relief from the thick smog which pervades the city.

The Ocean Development Exhibition, which ran concurrently with the Conference, was held at the Tokyo International Trade Centre, which is large enough to house about five exhibitions simultaneously. In fact, there were four different international shows taking place during the period of the Ocean Development Exhibition. The Exhibition was officially opened by the Crown Prince of Japan.

The displays were predominently Japanese. Canada was represented by 10 companies, sponsored by the Federal Department of Industry, Trade and Commerce. The Canadian display compared favourably with the other exhibits, and one of the main features of this display was a life-sized model of PISCES III, the latest manned submersible being produced by International Hydrodynamics Co. of Vancouver.

There were many excellent models on display, including models of sophisticated drill rigs, large super-tankers, dredges, fish farms and underwater habitats. Sophisticated land survey instrumentation, mini-computers, sonar equipment, submersibles, current meters, magnetometers and almost every conceivable instrument required for ocean exploration were on exhibit. Heavy exploitation gear, such as a large bulldozer capable of operation in 200 feet of water, was prominently displayed. There were over 700 booths in the exhibition hall and it was impossible to cover all the exhibits in depth in the limited time available.

IT&C and the commercial group attached to the Canadian Embassy had given the visit of PARIZEAU extensive publicity and considered the ship to be an integral part of the Canadian exhibit. Consequently there was considerable interest in the ship, stimulated no doubt by the fact that the Embassy hosted two receptions aboard. The first, held on the opening night, was hosted by the Canadian Ambassador, and had the Japanese Minister of the Environment as the honoured guest.

The ship had set up a display of hydrographic and oceanographic instrumentation and held open house during the length of the Exhibition for all those interested. From various reports it would appear that PARIZEAU was one of the hits of the show, which may be indicated by the fact that well over 10,000 people visited the ship during the 5 days of the Exhibition.

Once the Conference ended on October 9, PARIZEAU departed Tokyo immediately to commence the chemical oceanographic cruise mentioned earlier. The ship had to return to Tokyo Bay for 24 hours to shelter from a typhoon but then proceeded. The primary purpose of the cruise was to gather data which will aid in understanding the role of the ocean in absorbing CO_2, or in effect the buffering effect of the oceans in this absorption process. This is an extremely important study as CO_2 is a natural by-product from the burning of fossil fuels which is released into the atmosphere. Over the last few centuries there has been an enormous acceleration in the amount of fossil fuels (coal, oil, natural gas) burned, hence the amount of CO_2 released into the atmosphere.

If the CO_2 cannot be reabsorbed by the oceans but remains in the atmosphere, there is a possibility for a distinct climatological change and a gradual heating effect on the earth. Atmospheric warm up may melt polar ice caps which could raise the levels of the oceans and possibly submerge coastal cities within the next century. The data collected are now being analyzed.

A second purpose of the cruise was to examine and collect "tar balls" floating in the North Pacific. "Tar balls" are the residue from unburned fossil fuels - oil - which are being spread into the sea, presumably from ships, and give some indication of surface pollution. There are a significantly greater number in the Eastern Pacific than the Western Pacific, although some have been found in such places as Tofino.

After completing 19 oceanic stations spaced systematically along latitude 30°N across the Pacific Ocean, PARIZEAU returned to Victoria on November 2 for a well earned rest, having steamed a total of 22,000 miles since leaving Victoria in early July.

In retrospect, this has been an interesting, educational and most informative period. I think all those who participated in the Conference, the Exhibition and the cruise made significant contributions and gained corresponding benefits.

Thoughts of a Field Hydrographer!

In Ottawa the tape worms thrive
In Booth Street they are all alive
and slimy tracks mark where they crawl,
in and out along the hall

When I am dead and yield my ghost
mark my grave by a survey post
Let mild earth worms with me play
but keep vile tape worms far away

And if I deserve to rise
To a good place in Paradise
May my soul kind angels guide
and keep it from the official side.

With apologies to Edward Forbes
Marine Geologist 1815-54

"Whitewash"

REPRINTED FROM THE GLOBE AND MAIL

FEBRUARY 21, 1973

BOATS

BIG INCREASE IN FATALITIES ON THE WATER

JAMES PERRIN

There was a whopping 37.5 per cent increase in pleasure boating deaths in Ontario in 1972 over the previous year.

Total boating fatalities reported by the Ontario Safety League, were 121 deaths in 1972 compared to 88 in 1971. This is the highest since 1964 when 135 were recorded.

Small runabouts accounted for 66 deaths, large powered craft 14, canoes 28, rowboats and other non-powered craft 13. Fishermen numbered 28 of this total and hunters seven.

These figures show that too many boaters ignore safety regulations and take fool-hardy changes. There were 26 drownings from falling overboard and 67 from swamping and capsizing.

All boaters who have not done so, should take advantage of the remaining winter days to enrol in the Canadian Power Squadrons courses.

There is also a home study course prepared by the Canadian Boating Federation.

This family-type course can be purchased for $10, with additional family packs for $3 each. Write the Canadian Boating Federation, 67 Yonge Street, Toronto 1, Ontario.

ON THE LEVEL?

A discovery with potentially far-reaching implications for the hydrographic art has recently been announced by the Lake of the Woods survey party. Though a mathematical proof of the thesis is presently unavailable, we feel that the concept is sufficiently established and contains enough intrinsic merit to warrant a brief outline here.

Basically the theorem asserts that a far water horizon is level, (north and south if looking east or west), and that the eye of the observer remains in a level, (horizontal plane as defined by the horizon, (left and right) and the observer, (to and fro). This condition reputedly holds true within wide limits of working elevations. A possible application of this knowledge might lie in the field of rock elevation determination. The authors theorize that a bare island of elevation less than ten feet can be accurately measured from a launch, using only the standard ten foot sounding pole. The procedure, it seems, would be to manoeuvre the launch close to the rock or island in question, (for accuracy the closer the better), to place the foot of the sounding pole on the water's surface, then to align the horizon, the top of the rock, and the observer's eye. The pole, held close alongside the line of sight, is now read and the result recorded.

Refinements to the basic system have been suggested. Known fractional reductions might be compensated for by the holder of the pole. Differential levelling techniques might be used for obtaining elevations of higher islands. (This would probably involve landing two men on the island, though elevations of up to twenty-eight feet have reportedly been obtained with this system by a lone hydrographer ashore.) For differential levelling it would, of course, be necessary to read the pole to the nearest tenth of a foot. Prudence would indicate that this procedure should be carried out in both directions. Binoculars might prove useful.

The proponents of this theory concede that its use will result in no saving of time over present practices but anticipate that the consistent accuracy experienced may eventually result in its replacing the accepted standard procedure of guessing.

LIGHT HOUSE JOKES

HYDROGRAPHIC ANONYMOUS

When you get the urge to go into the field they send someone around to drink with you until the urge passes.

SMOG EXPERT

One who can cut through the smoke and find his wife at a Saturday night beer party.

MINUTE MAN

A fellow who double-parks in front of a house of ill repute.

HIGH FIDELITY

A drunk who goes home regularly to his wife.

EXPERIENCE

The wonderful knowledge that enables you to recognize a mistake when you make it again.

PROOFS

A sweater girl proves that man can keep his mind on two things at once.

ECSTASY

Something that happens between the Scotch and Soda and the bacon and eggs.

FALSIE SALESMAN

A *Fuller bust man.*

SCIENCE FAIR

If, as the scientists say, sex is such a driving force, why is to much of it nowadays found parked.

LIGHTHOUSE INTERVIEW

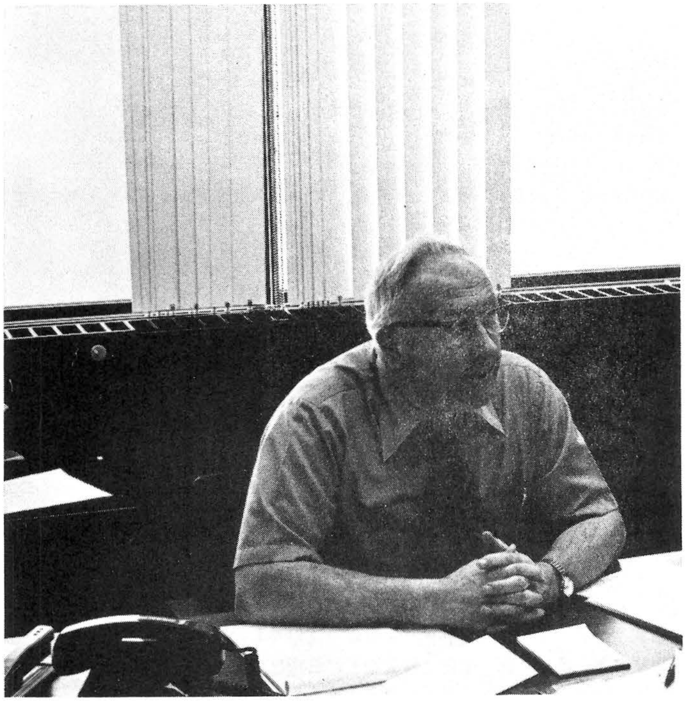
This is the first in what we hope will be a continuing series of interviews which LIGHTHOUSE will conduct with various personalities involved in the art of surveying Canada's waters.

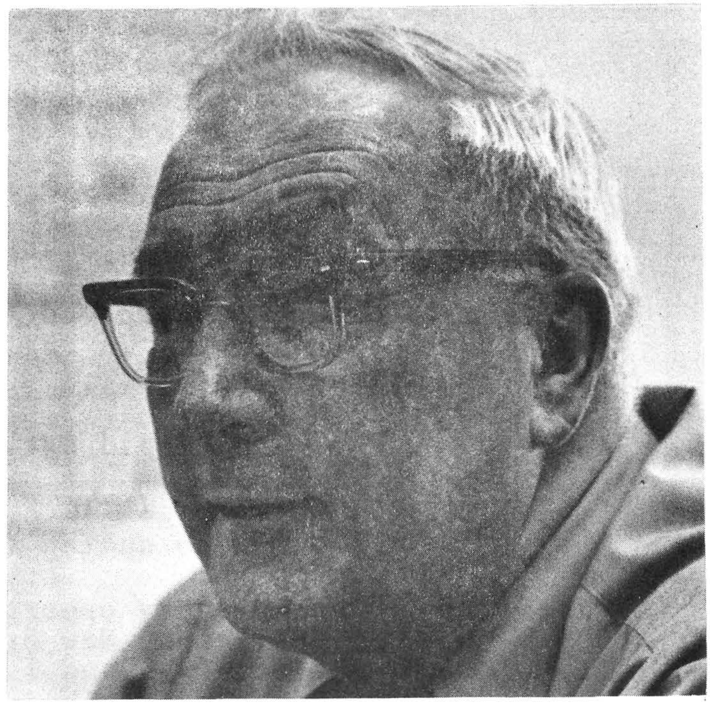
An interview of this type is not new nor is the format unique. However, we thought it was a good idea and well worth a try. In the early phases, when the interview was still in the planning stage, our primary concern was -- "Who do we interview?" As this was the first interview we would hold, we weren't quite sure what we should ask -- obviously LIGHTHOUSE is not the place for expounding upon government planning or theories of management. What we wanted, we felt, was to talk about what this particular person had done, what he would like to do, his likes and dislikes -- generally who he was. For our first interview then, we wanted someone who has had an interesting life, who could talk freely about it and at the same time (to ease our stage-fright) someone whom we knew quite well and could easily "rap" with.

We decided to approach Gerry Wade, a Central Region Hydrographer -- late of the Polar Continental Shelf Project (Now Arctic Surveys) as he seemed to be just the person we were looking for. Gerry was more than co-operative and supplied us with a well documented resumé of his life and career up to the present time. We were delighted and from this drew up a series of topics which we wanted to discuss.

So one day at noon, armed with a cassette tape recorder and our questions, we moved in on Gerry and the following interview was the outcome. We have done very little editing and the little we did do was to preserve continuity.

Gerry Wade was born in Fredericton in 1922 where he received his primary and secondary schooling. After the war, he attended Mount Allison University and graduated in 1949. As Gerry's qualifications, which include a B. Sc. from Carleton University, a DLS, and two provincial survey licences (Nova Scotia and Prince Edward Island) are an integral part of the man, we felt this was a good place to start.





Lighthouse: *You graduated from Mount Allison University in 1949. What did you study?*

Wade: I graduated with what you'd call an Engineering Certificate. In the maritime university group there are very few of them give a degree in engineering. So we have what we call the associate colleges or universities and most of the graduates of these universities go to Nova Scotia Technical College or McGill to complete their last two years of specialization. Mount Allison was an associate university. U.N.B. was the only one in New Brunswick at that time that gave a full degree in Engineering.

Lighthouse: *So your first introduction to surveying was at Mount A, or had you previously had some experience?*

Wade: I had some experience before the war but it was mostly involved in installation of telephone lines in the backwoods of New Brunswick, through to the different forestry towers in the forestry camps they had in those days.

Lighthouse: *Was this a summer job?*

Wade: I was in High School.

Lighthouse: *Were you involved in surveying during the war? You weren't in the Engineering Corps or anything like that .....*

Wade: No, I'm afraid not.

Lighthouse: *I hate to ask such an obvious question, but what did you do during the war?*

Wade: Ran -- every opportunity!! I joined up in Fredericton, New Brunswick Battery -- the 104th Anti-tank -- and I went over as a reinforcement, to the 2nd Division and joined the 2nd Anti-tank Regiment. From there I went on a driver-operators course - which was driving any type of armed forces vehicle - and radio operator. I came out of that a driver-operator and there was a push on then for the Mediterranean. The 1st Division had already landed and when we left I was assigned to the 5th Division. I didn't get back to my own unit at all and we left England supposedly for Northern Ireland. We ran into our first bit of excitement when we passed through Gibralter which was under attack then by the dive bombers of the German Reich. We landed at Naples, reorganized and drew equipment from units of the British 8th Army 5 R.H.A., 7 British Armoured Division, which was being relieved by the 5th Canadian Division. We joined action at Ortona. This was our first action, one of the more famous scrapping spots of the war, I guess.

Lighthouse: *So was Naples under the allies when you landed there?*

Wade: Yes, we thought it was a very convenient time to arrive, after the other fellows had cleared it out.

Lighthouse: *And then you were also involved in the war in Western Europe?*

Wade: Yes. When they moved the Canadians out of Italy we went across through Leghorn and up through Marseilles, and through Paris into Belgium. We put in our first action at Nijmegen and we ended up in Emden.

Lighthouse: *When did you go through Paris?*

Wade: It was in February, 1945.

Lighthouse: *So you were involved in the final push towards the Rheine.*

Wade: Belgium had been pretty well cleared out but not Holland. Nijmegen is pretty well the southern part of Holland; we moved from there right through to Emden on the Baltic Sea. In fact, that's where the last of them took off back home from, the Germans that we didn't catch. My operation as a soldier was as a FOO, a forward observation outpost and that was my duty from the time I struck Italy until we completed our operation in Northern Holland. We were the eyes of the artillery, and we directed the fire onto what was holding up our tanks and infantry. We travelled with the infantry (Toronto Irish) and armoured regiments (8 N.B.H.) and gave them covering fire as they advanced from one position to the next. It had its privileges.

Lighthouse: *It had?*

Wade: Well we were usually among the first there.

Lighthouse: *Did you stay with the occupation forces in Germany?*

Wade: No. We all had pretty well all we wanted of it. We were pretty eager to get home, I guess, and I had been there longer than most and was one of the first boys relieved from the 17th Field Regiment. There was a great supply of conscripts We got a large number of those in towards the end of the war, and those were the boys who mostly took over our particular area. Some of the older boys stayed on but most of them were the newer boys who hadn't been there that length of time. The big push then was to see if we wanted to go fight against the Japanese.

Lighthouse: *How did you become involved in surveying and why did you choose this particular outfit.*

Wade: Well, there was very little doing in the Maritimes. There was no chance of employment at all, so I cashed in my insurance policy and moved up to

Ottawa where I had a friend I had gone to school with in Mount A. I moved in on him and after getting down to the stage of borrowing some of his money, I finally had an offer with the Mines and Resources with Topographic Survey. I joined the Air Photography Section with Mr. A. Gammon. There wasn't much chance of getting to the field from there although I was fortunate enough to get out the first year with Mr. A.C. Tuttle. My friend, Matt Wuhr and I, asked what chances there were to get ahead and become a field officer. We were advised to write our D.L.S. which we started getting ready for. Matt got his and transferred to Legal Surveys, just after he articled, I joined the hydrographic and articled to Ralph E. Hansen and completed my articles under him.

Lighthouse: *So while you were in the hydrographic service you were articling?*

Wade: Oh yes. I did't article until after I joined the hydrographic.

Lighthouse: *Is this in fact still possible for the young hydrographer?*

Wade: Yes, it's still possible. The only problem now is that they stipulate if you choose to write your D.L.S. from here you'd have to serve one year with Legal Surveys as part of your articles, and two years with the hydrographic, because they have their own particular methods of plans, laws -- you would have difficulty learning the laws, normally, without a great deal of effort, unless you're working with them, and they are. That's their stipulation now. Of course things have changed a great deal since I wrote mine, there's a lot of offshore activity, and there's electronic positioning systems involved. That is why they are quite willing to go along with us. I think they appreciate the fact that we've got that bit of experience and knowledge (expertise).

Lighthouse: *So you got your D.L.S. while you worked for the hydrographic service. How long were you a topographical surveyor?*

Wade: Just one year. Actually I wasn't a surveyor when I was with topographic. I went to the field, fortunately, but I was only going to be allowed that one year.

Lighthouse: *Which I guess brings us to where you've been and what you've done in the Hydrographic Service.*

Wade: I joined the hydrographic in the spring of 1951 and Chuck Leadman and I went on the ALGERINE together. He joined about the same time as Dusty DeGrasse, Mike Bolton -- Bob Golding came a year later I believe. Quite a few of us came down from Topographic Surveys and our first year was in Frobisher Bay, Acadian Cove around Resolution Island in the Arctic. From there I moved onto the KAPUSKASING where I began my articles with Ralph Hansen. In 1955 I took over the survey from Ron Logan at Canso and I worked from Canso through to Sherbrooke till '58. In '59 I took over the St. Lawrence Seaway Survey. That was the year that the BRITANNIA sailed through the Seaway with the Queen and the President of the United States, for the grand opening. We did the survey in L. St. Louis including the approaches to the locks at Beauharnois and we swept the area opposite Beauharnois and Isle Perrot for the combined American-Canadian Naval Fleet which stood by and fired a salute as the BRITANNIA went by in the fog. We had quite a good year, Sid Van Dyck, Bob Golding and myself, and a chap from the east coast who now has his doctorate, S.D. (Stuart) Smith. He was our student assistant that year. As a result of that survey I have a very nice letter on file from the Queen's Representative thanking me on the Queen's behalf, and pictures of the Queen and Prince Philip were included as momentos. As a matter of fact, the day they went through the fog was so thick, we had our levels and transits mounted on top of the hotel so we could see the big passage, but you couldn't see across the street. We didn't see them at all. That was about the time I was getting interested in going back to university. From the seaway on, I went on the bigger ships on the east coast and was allowed to come home early each year. I went on the BAFFIN the first spring. When she went north I transferred to the ACADIA. I stayed on the ACADIA for three years, then back on KAPUSKASING for a year and in 1964 I had my rotation year, which was with Water Levels Section. That was the year of the all-time low on the Great Lakes. My assignment was with Mr. G.C. Dohler. I enjoyed it very much. They gave me a free hand to dig into the causes, effects and preventive measures. We supplied between us, the information to the House of Commons through the Minister. In 1965, I went back out in the field again with Chuck Leadman. 1967 was a rotation year. 1968 and 1969 were on the Ottawa River and 1970 on Revisory Surveys on Lake Huron and Lake Superior. In 1971 I went to Polar Shelf, 1972 Polar Shelf again, and this year on rotation with a short stint with Polar Shelf. Next year hopefully, Polar Shelf again with the Danish Group. 1971 was perhaps the biggest chance to see the inter-action of oceanography and hydrography, that we've had yet. With the A.I.D.J.E.X. (Arctic Ice Dynamics Joint Experiment) people, I had one of the most remarkable field seasons I ever remember. I enjoyed it, and I enjoyed the people I associated with. ----- Lots of girls!!

Lighthouse: *When did you finally get your university degree, then?*

Wade: Let me see. 1967 I believe.

Lighthouse: *So how many years were you working at it?*

Wade: I started that about 1960 but there are one or two years when I went out to the field and didn't come back in early, so I skipped one or two years. I was only taking a course, maybe two courses, at a time. During the year I was in, 1964, I took two courses winter and summer. In the meantime they changed the number of courses I had to take which was very crafty. Some of them were half courses, but so far as I'm concerned you work just as hard on a half course as you do on a full course!!

Lighthouse: *Where did your provincial survey licenses come into it? Did you have to article to get those after you got your D.L.S., or can you just write some exams?*

Wade: You just write the law papers. They would, at that time, give you credit for your D.L.S. Now you have to article for a year to a provincial Land Surveyor in that province. But in those days they gave me credit for all my articles and most of the credit for surveying experience. It was just a case of law. I thought they would be useful, first of all because we were operating mainly out of Nova Scotia in those days, and later on when offshore activity became a little more important, I went after my P.E.I. papers and New Brunswick papers. New Brunswick have a little stiffer stipulations now, so I've more or less given up on that.

Lighthouse: *And during this time you took a course in electronic positioning systems in California.*

Wade: That was the year I came off the Ottawa River. We had a concentrated course given by Mr. Thomas J. Hickley, retired Director, Eng'g. Development Lab., of the U.S., Coast & Geodetic Survey and Admiral Sir Edmund G. Irving, retired Hydrographer of the Royal Navy of the British Admiralty. They conducted the course at U.C.L.A., a seven day course during the winter. I went down there with a top coat, sweater, long johns --- everyone was running around in shirt sleeves and shorts. It was beautiful. And my one and only trip that far south.

Lighthouse: *Who else was taking this course?*

Wade: Mr. S. Van Dyck and the United States Navy engineers were on this course, salesmen and some of the representatives of the electronic positioning companies. Really all with a good deal of experience in electronic positioning systems. And the chap from the U.S. Geodetic Surveys was a remarkably well informed fellow. Admiral Irving provided a lot of standard survey-type background as well as providing a lot of humor. He is a very witty chap. He'll be here this year for the Survey Institute Convention, as a matter of fact.

Lighthouse: *The combined Canadian-Danish survey in the Arctic sounds interesting. Could you tell us something more about this?*

Wade: Well, when we had the survey going into Nares Strait and this minor problem of shoreline, particularly on the Greenland Side, and the question of the location of Hans Island. The Danes knew that we were going in to position the island, and do control surveys down the Greenland shore and they expressed an interest in our operation and asked if they couldn't join in. They sent two chaps along - a former hydrographer

Dr. Milan Thamsborg, Oceanographer, and a Geodesist, John K. Ekholm, who were good people to have along on a party, good workers with lots of experience, and good people in camp -- you know, easy to get along with. They worked well with us and we supplied them with all the information we obtained on the traverse, aerial photography, and the whole lot. And once they found out we planned to go in there and do the surveys, particularly in Kane Basin which is just above the north water (which is open water all year round, pretty well) Dr. Thamsborg said his government would be interested in taking part in a combined oceanographic-bathymetric operation. We agreed that we would, for this, cut down the cost for both parties of course. They have suggested a total of 12 people they propose to send along as the delegation - an equal number of hydrographers. The main stipulation was that it should be a Canadian in charge of the operation, Polar Shelf will still co-ordinate it and supply whatever materials they need in the way of camp supplies and food and so on. They thought it was a good idea and asked if I would be interested in going along as camp commander again. I was only too happy to accept -- I thought that was quite a compliment. And I do enjoy life up there.

Lighthouse: *So you forsee this type of combined international operation in the future?*

Wade: Oh, I'm sure of it. A.I.D.J.E.X., for example, was an American-Canadian operation, very elaborate. Actually it was a reconnaissance type of run, they won't start their proper observations until about 1975. They're just testing out their equipment, methods and so on with us. They did that two years in a row (1970, 1971). Last year they went up in their own camp, north of Barrow, Alaska, to which Polar Shelf sent people. Earth Physics sent along some people. They had Russian visitors to their camp and to the Polar Shelf establishment in Tuk. They've been to Polar Shelf headquarters in Ottawa at least on one or two occassions -- to discuss combined operations. The Japanese want to become involved, so I would say in the future - in the not too distant future -- we will have several of these people involved. Thamsborg himself along with other scientists has been involved with the Canadian Navy run up through

Nares Strait to Alert. Last year when the St. Laurent went up to the north water (they didn't get there but they tried) he was aboard. So we have had quite a bit of this in the past. It just hasn't been made too much of. Small groups, mind you, but outside interests nontheless.

Lighthouse: *You mentioned the Russians. They have quite a history of surveying in their own Arctic. Do you ever forsee a joint survey with them?*

Wade: That has been proposed already; I don't know the exact area that they're selecting or dates. They have been involved since the early 20's in the Arctic. They started the Northern Passage prior to the war. In fact they made the northeast passage before the war several times. They had the first ice camp in 1937, North Pole One. They have got a lot of experience in the Arctic, we can learn a lot from them, and they in turn can learn a lot from us. But they have got a lot of good solid background experience in the Arctic. Hans Pulkkinen has worked with them in their hydrographic service before the war, in the Arctic, and was in charge of one of their survey ships. He went along on these meetings with the Russians to act as interpreter. He was rather disappointed at the fact that all the Russians spoke English. But they had a very good visit with them and a pretty open exchange of view apparently -- no holding back.

Lighthouse: *How much of your career have you spent surveying in the Arctic?*

Wade: I had about four years including the year in the Yukon. Now that was a paradise - very different from the other areas north of the circle - heavily timbered, all sorts of game and fish, rugged mountainous country ----- beautiful!!!

Lighthouse: *But you do like working in the Arctic?*

Wade: Oh yes. Sure do!! I haven't had an assignment I disliked yet, but this one I like to think of as special.

Lighthouse: *You are a member of the Regional Offshore Working Committee.*

Wade: Yes, I was asked by Mr. McCulloch to be the local representative, as a matter of fact to represent the whole directorate.

The first meeting was in Edmonton. There were about twelve people there from the different branches of Environment.

We did some research and discussion as to what we knew about Beaufort offshore, e.g. the effects of drilling, the white man among the native population. Also how to preserve the wildlife areas and the sanctuaries. We even discussed this new island that Imperial Esso is building in the Beaufort, how it would affect animal life around it and was it a good idea. We also discussed the problems that might be encountered with oil spills and some preventive measures. We outlined a series of programs that different branches of the department might like to carry out in the future. Not ones that were already planned for this year but new ones entirely as there were funds available for this. Our main submission was that we requested that more studies be made into the unknown factor, i.e. how the wildlife would be effected. We recommended the delay of one year in the issuing of permits to operators so that we could make a more complete study and be better informed as to what we were involved in. We submitted this to the Prairie Regional Board, Dr. MacPherson's Group.

Lighthouse: *What sort of people comprised the committee?*

Wade: Mainly wildlife, fisheries, atmospheric environmental services groups. There were representatives there from the Northwest Territories who were responsible for the issuing of these permits. Marine Sciences, of course, and on one occasion we had a chap there from the west coast, Ralph Wills, who sat with me in the meeting at Winnipeg. I was happy to have his moral support. This is west coast territory anyway (the Beaufort) with the exception of Polar Shelf involvement. They do have several programs already going in that area while we have none. I enjoyed it. It was very informative.

I won't be able to attend the next one for I am going to be up north anyway.

Lighthouse: *You mentioned earlier in passing what you will be doing next year. Perhaps you can expand on this.*

Wade: Well, we will be doing a velocity propagation study in Amundsen Gulf of the Decca 6f Lambda chain. We will be setting up supposedly on Horizon Islets and House Point. However, the description of Horizon Islets is very vague and my only description from any one who has seen it is that it is just a pile of rocks. How big the area is, whether we can put up our tents and our ground mat or whether we will have to choose some alternate sight, I don't know. I haven't got hold of Mike Eaton yet to discuss it with him but we may have to change this site. I think it will be very interesting. We will be going up again in August to measure the same parameters, which is actually the difference in readings between the two monitor stations. We will do the same thing again in August and hopefully we will find out what the ice effect is on the propagation velocity. This, of course, will be restricted to that area because you wouldn't get the same results out on the Beaufort. It will give us some information on the delaying effect of the fresh water ice.

Lighthouse: *How does this tie in with earlier studies of velocity propagation?*

Wade: Neil Anderson has done some Hi-Fix studies up farther in the Lincoln Sea but I don't think there has been a real serious study of this type over the ice. We have had some questions raised on our accuracies especially when we were in the Beaufort in 1971. We had distances of 400 miles from the stations and very poor cuts -- but the best that were available.

Lighthouse: *How feasible do you see this method of obtaining depths through the ice? Would you, for instance, like to see it used in other areas or do you think that this is just one restricted area that it should be used in?*

Wade: Well, actually, as far as hydrography is concerned I am not impressed with the coverage that you get. It's all spot soundings -- not a continuous profile as you would get in open water. It's a reconnaissance type of information. But these surveys serve their purpose, they give you a general picture of what's there.

Lighthouse: *Well, all in all it seems you've had a pretty interesting life.*

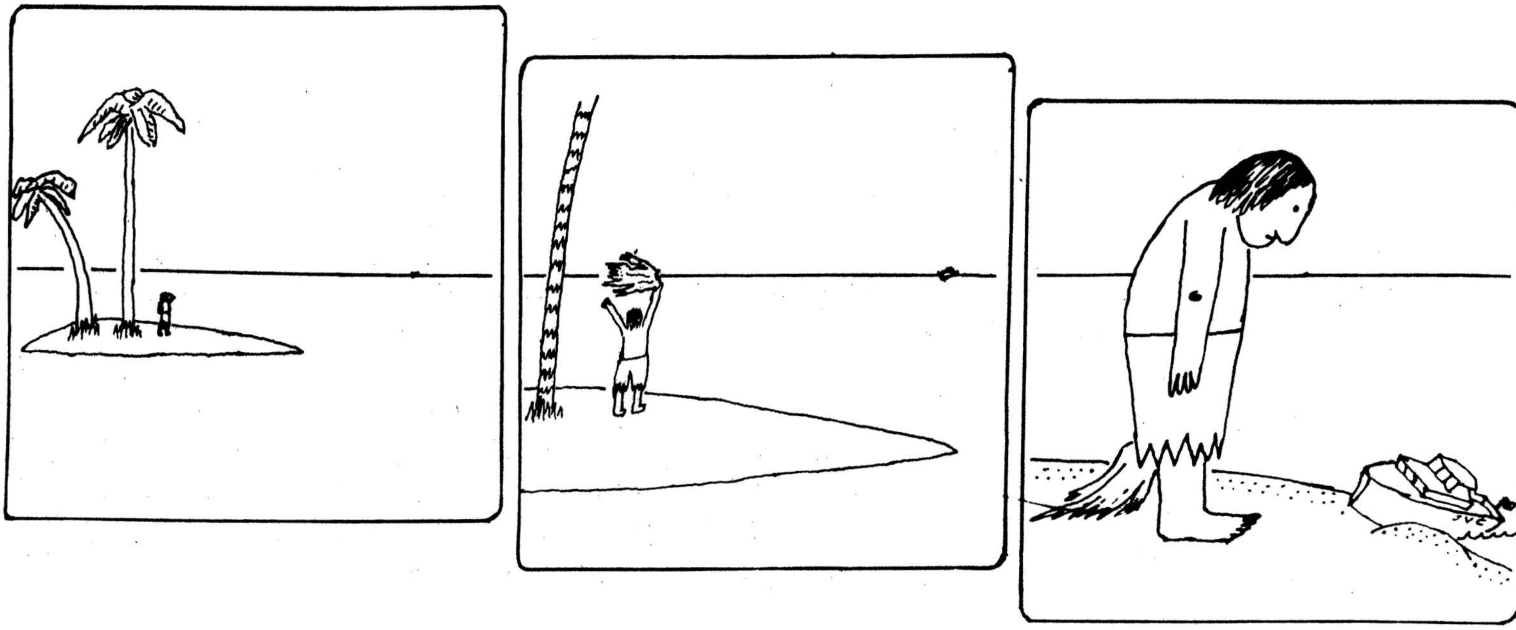
Wade: Oh yes. Looking back on it I've had a pretty good one. I've been fortunate. My wife has encouraged me in everything I've done.

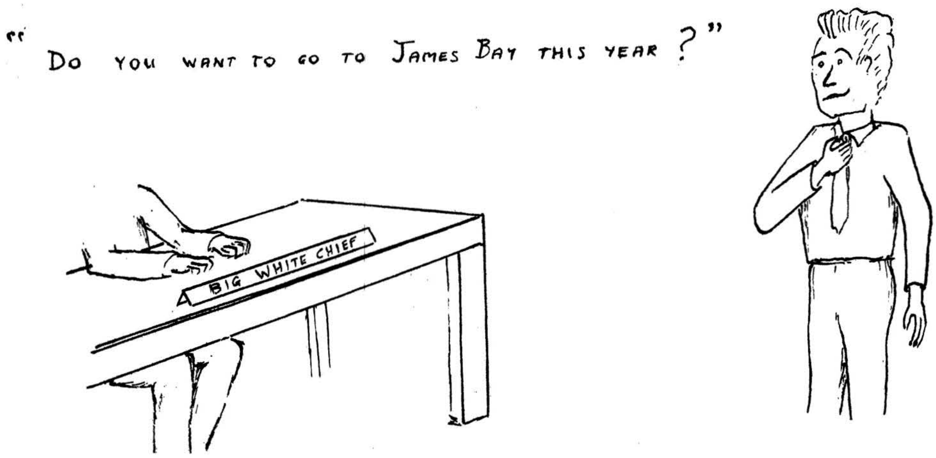
No matter what you get into, I think there will be periods when you are a little dissatisifed. But life has been good to me. I like what I do and I like the people I'm working with.

Lighthouse: *Well, we would like to thank you very much for your time. It's been a real pleasure and an eye opener for us.*

Wade: Well, I appreciate the fact that you are interested in what I am and what I have done. It's not very much -- it's just me.

Lighthouse: *That's quite a bit.*





THE HAPPENING AT JAMES BAY

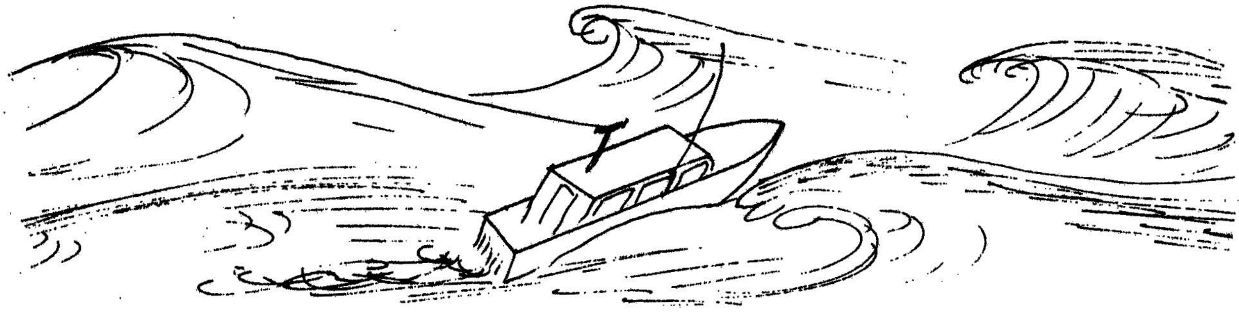
James Bay. The moment we first heard the words we knew that this was not any ordinary place.

James Bay. The words have a ring to them, a feeling, an emotive and evocative taste. Like with such words as Dunkirk, Dallas, Christmas, Friday afternoon, Monday morning, Burlington, there is a quite definite response from our nervous system. Something akin to that excitement you feel when your number is called out for the door prize or bottle draw... Maybe it's like the feeling you get when you spot a police car just behind you... Or perhaps the anticipation of arriving home to find your favourite dish almost ready and candles on the table...

James Bay. This was surely going to be no ordinary survey party. In the event, though, our Field Season up in James Bay this year was not really very much different from any other Hydrographic survey party, but as Gerry Wade says of Another Place: "Everyone who has been there may love it or hate it, but sure won't let you forget that he has been there."

This was certainly the most interesting of all our Hydrographic parties last year, and all of us were secretly rather pleased to be on it ("Yes, I was on the James Bay party...") though when we set out we were quite prepared to do battle with the subarctic conditions there and were almost disappointed to find that despite all those dire predictions of the ice and hideous weather we would have to contend with up there we did manage to get quite a lot of work done in the short season that was left to us between our late arrival there and our early departure. We had more or less thick fog for two days out of every three for our first few weeks, but thanks to the electronic all-weather wonders of our Mini-fix positioning system and our little radar sets we were able to write in quite tremendous mileages on the daily statistics sheets pinned up on Bruce's office wall.

Sometimes, though, it was a little too choppy to do our sounding, and such days became more and more frequent as the short season wore on. On those occasions we would come home feeling a bit ashamed at having to admit defeat. The first day it was too rough to work we just kept going, determined



SOMETIMES IT WAS A BIT TOO CHOPPY ....

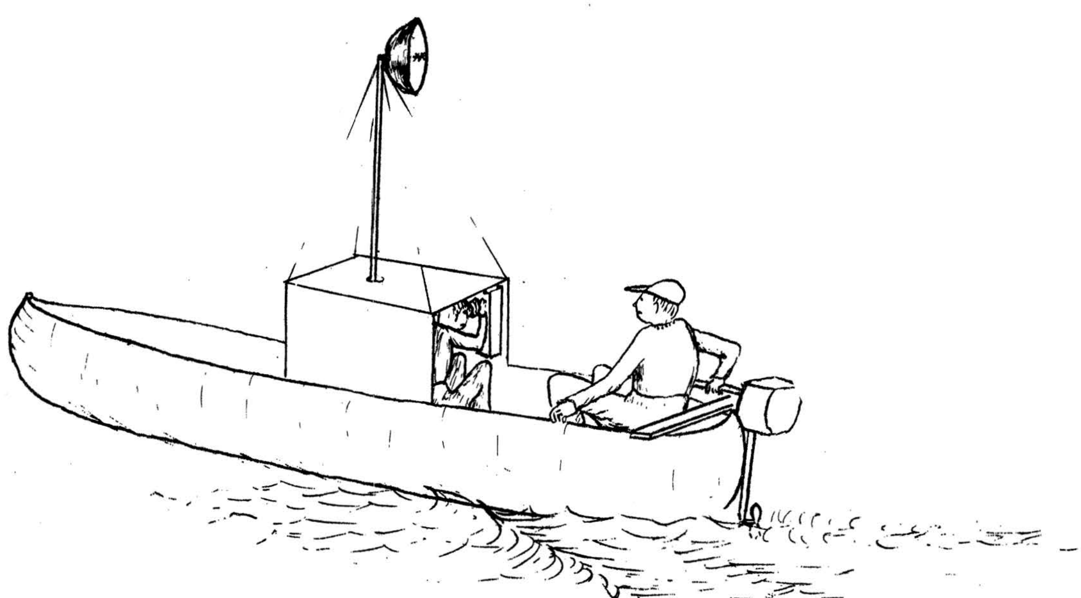
not to give in yet, but at the end of a few sounding lines we (and, no doubt, our equipment) were feeling so battered that we retired behind a friendly looking island to lick our wounds for a while. After a few minutes we tried to do some more sounding but then quite suddenly we realized that not only were the waves breaking over the launch, but they seemed to be inside the boat as well. Indeed they were. With each wave that came over the bow the little escape hatch on the short foredeck of our launch was opening a few inches to welcome the water inside. Then just as we discovered what was happening a bigger wave than the others buried us, the hatch slammed open and the next wave came right in to make itself at home.... A nasty moment.

That decided us and we turned for home. We were not able to get at the hatch to secure it down, but with a bit of anticipation on the part of our coxswain we had no more waves coming inside the boat and our hand bilge pump proved its worth.

We of the 'ship party' lived with our three launches on board the C.C.G.S. NARWHAL which is a 255 ft. arctic personnel carrier and depot ship on loan to us from the Ministry of Transport. The NARWHAL made very spacious and comfortable quarters for us, and for most of the time stayed at anchor among the Loon Islands as we could not take the ship in to Fort George and were thus quite independent of the shore. This meant, however, that in addition to being deprived of the solace of home life we were also unable to enjoy the cabaret and dancing at the Fort George night clubs and hotel which were described so vividly for us by our friends on the 'shore party', but at least the mail arrived in Fort George three times weekly (God Willing, Weather Permitting, People Writing) which our helicopter would bring out to us.

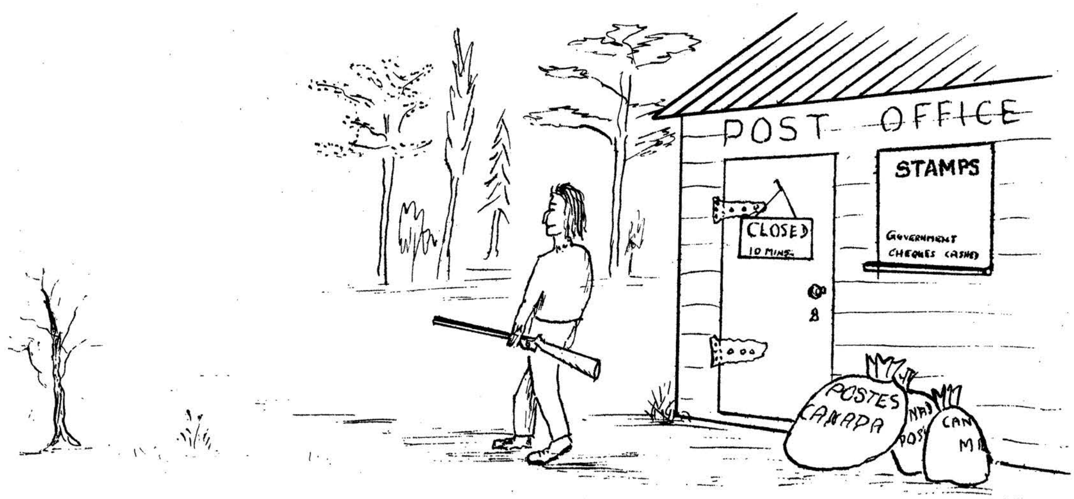
He must have taken pity on us, though, for he sorted out our mail and sent it to us the next day. Merrill -- our electronics boffin -- almost got lynched that day: he received twelve letters from his wife (Count them. Twelve!!!) and most of us felt lucky to get one or two from our wives or girl friends. But then he did write more letters than we did.

But compared with the men of the shore party based in Fort George we were fortunate indeed, despite their tales of the fabulous night life. We had three fully equipped original-and-genuine new-improved-model hydrographic launches with which to do our sounding. They were doing all their work with a pair of old Indian canoes, which was all that was available in the area at the time. Better than nothing, but leaving something to be desired. These old Indian canoes turned out to be surprisingly sturdy and seaworthy craft, but the men decided that a few modifications were called for.



THEY DID ALL THEIR WORK WITH CANOES.

There was one memorable occasion, though, when we had been away with the NARWHAL for several days doing the round of our various Oceanographic Stations, so when we arrived back in our anchorage we were understandably quite eager for our mail as we had missed two or three deliveries while we had been away. To save time we went ashore for the mail ourselves this time, and thought we would also have a look at the night life of which we had heard such wonderful things. Alas, we should have stayed on board the NARWHAL. The night clubs turned out to be entirely ficticious, and the only hotel was quite "dry"... However, there by the door of the Post Office, leaning against the wall outside, was a pile of mail bags. "Big delivery today" we told each other happily, but when we tried the door we found it locked.... The Postmaster had gone off on a hunting

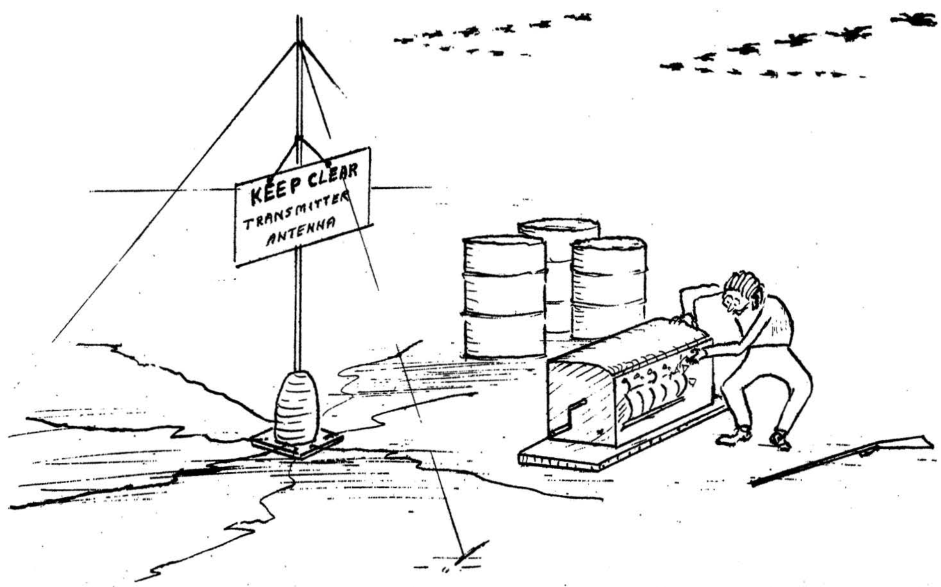


THE POSTMASTER HAD GONE ON A HUNTING TRIP.

and fishing trip, and these mail bags were the accumulation of several days. Unless the hunting was particularly good or the weather stayed fine he was expected back maybe on Friday, the Chief told us. "But don't worry," he said soothingly, "the mail will be quite safe here until the Postmaster returns. No one will touch it....."

They rigged up a little plywood shelter on each canoe and topped it with Hydrodist antenna and brilliant red flag. The original motive power supplied with the canoes was a pair of paddles, but this method proved to be not only a trifle slower than required but also very tiring, so each canoe was given a powerful outboard motor. They then furnished each canoe with a low stool on which the happy hydrographer could seat himself, but even with the addition of all these modern luxuries both canoes were inclined to be a little damp, drafty and dismal in all but the loveliest of weather. Unfortunately these small canoes needed not only quite calm weather to run their sounding lines but also good visibility, so they sometimes got only two or three full day's sounding done in a week. On those days, though, they really extended themselves and would get back to Jake's office tent (Yeah. Tent) with goodly mileages for the Field Sheet. Unless, of course, there were problems with mechanical or electronic breakdowns. These things never seem to happen except on those beautiful calm and lovely days when we enthusiastically set out to cover phenomenal mileages.

With our Mini-fix stations set up in such remote places we really thought that they would not be bothering anyone and that they would be free from meddling by all except inquisitive Polar Bears, but one fine morning our three launches all eagerly set out to get in some sounding before the weather broke. Alas, all three launches were back in a few minutes. One of the stations had gone off the air. Merrill and Bruce went off in the helicopter to investigate and found that all was well with the equipment. What had happened was that a hunter had turned off the generator engine as the noise of the motor



A HUNTER HAD STOPPED THE GENERATOR....

was disturbing the geese and spoiling his day's hunting... After that we rigged up thermal-electric generators which are silent, though needing more frequent servicing.

All in all this season up in James Bay was quite an experience. Never a dull moment. And would you believe that I found myself Volunteering to go up there again next year??

How about YOU coming along too? We guarantee you a Season you'll be boring people with for years to come. Just sign along here. then you too could say: "Yes, I was on the James Bay Party....."

WARREN LANDING BLUES

The DC 3 took off that day
Ninety minutes late.
"It's quite the thing", as Jake would say,
"How certain people rate."

Heading north from Winnipeg
Straight to Playgreen Lake
We can't turn back, no use to beg
"Look at Jackie shake!"

At Norway House we had to wait
To get our chartered flight,
And contemplate our present fate.
"Holy Jumpin' Fright!"

The little aircraft got airborne,
No problem about that!
Warren Landing looked forlorn,
The airstrip wasn't flat.

But we'd find out and have to date
The meaning of forlorn.
Abandoned, fully desolate,
At times, "Why were we born?"

Right away we made a start
To get the place in shape ...
Building desks and other art -
"Reuben, where's the tape?"

The helicopter came one day
The rain was blowing by.
He flew upwind four miles, I'd say,
And there it was "Bone Dry".

In our fleet we've got four boats,
For them our hopes ran high
But hulls were thin, they needed floats
At times we wished they'd fly.

For there are rocks up here, you see.
The bottom isn't flat,
A ten foot shoal is often three
And sometimes less than that.

"Francis Avery, you are where
With surveyor, Dick?"
"Lab Two is down, Lab One is here
And Stewart's getting sick."

"Ray Chapeskie, where are you
With your coxswain, Jack?"
"You say that you are in Lab Two,
And won't be coming back."

Super Coxswain in Lab Three,
With Langford at the wheel,
Blame it on that drinkin' spree.
We know how you feel.

Arnie Welmers in Lab Four
Is heading back to base.
"I can't take wind like this no more ...
I'll say it to your face!"

"Roger Whaler, Whaler Roger
Where are you right now?"
"I'm on a rock, sir, roger dodger,
Unit went 'Kapow!'"

To date the Labs are full of dents
And sometimes there's a hole.
Don't blame it on the survey gents
They have to find each shoal.

But thank the Lord for one day off
In one week out of two
Everybody's had enough
"Now what shall we do?"

The bottle'd roll, the film would play
A thing I wouldn't miss
"You little bitch, come here," he'd say
"And give a guy a kiss!"

But Sunday morning heads were sore,
And we don't really care,
We cannot leave the bloody shore
And go to Church for prayer.

H_2O BONSPIEL

On February 25th, the second annual H_2O Bonspiel was held at the Wentworth Curling Club in Hamilton. As was the first Bonspiel, it proved to be a great success with the participation of 64 curlers. The winning rink was skipped by Dennis St. Jacques.

Listed below are the various prizes:

"A" EVENT

Winning Team			Donated By
D. St. Jacques	1st prize	Car stereos	Motorola
R. Courtnage	2nd prize	Irish Coffee Sets	Misener Marine
H. Comba	3rd prize	Carving Set	ComDev Marine
E. Lewis	4th prize	Lighter & Cards	Taylor Transfer & Tellurometer of Canada

"B" EVENT

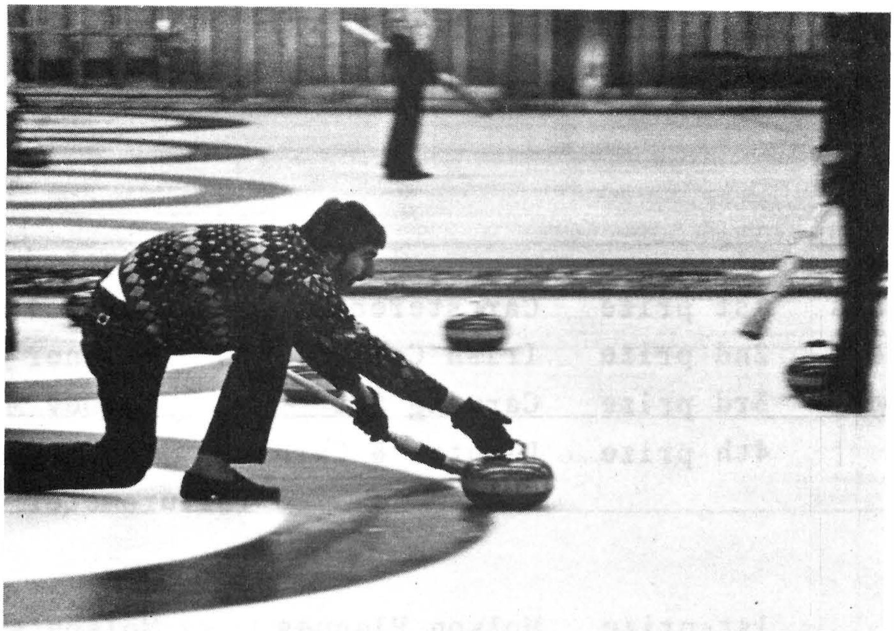
M. Comba	1st prize	Molson Plaques	Molson's
B. Clemmens	2nd prize	Transistor Radios	Fidelity Van & Storage Co. Ltd.
A. Appleby	3rd prize	Tape Measure; Screwdrivers; Cards	Rapid Blue, Vallance Brown, Tellurometer of Canada
J. Delorey	4th prize	Liquor	Wentworth Curling Club
B. Chapil -	Lowest team -	Knives & Cards	Wild; Tellurometer of Canada

We would like, at this time, to express our thanks to all the Companies which donated prizes for this event.

H_2O CURLING BONSPIEL - 1973

Maybe next year they'll have prizes for style.
Including, perhaps, free needles and thread??

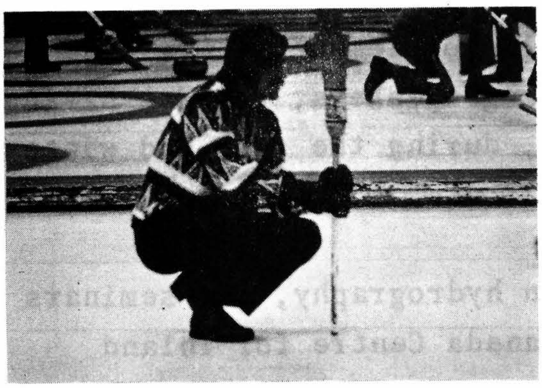
ON YOUR MARK .....



..... GET SET .....

..... RRRIPP!!! .....

H_2O BONSPIEL -- ACTION HIGHLIGHTS



MMM....... *Will it...?* ..... *or won't it...?*

Beautiful Shot, Gerry !!!

SEMINARS

As usual, the Central Region Branch of the Canadian Hydrographers' Association had a full complement of Seminars and Luncheon Meetings with interesting speakers, besides having the usual regular Business Meetings, during the fall and winter of 1972-73.

To further the interest in hydrography, the seminars were open to all personnel at the Canada Centre for Inland Waters, while the luncheon meetings were open to members and those having a close affiliation with hydrography.

The following list will show the variety of interests presented at the meetings:

TOPIC	SPEAKER
New Ideas - Hydrographic Applications	*Hydrographers*
Simple Method for Reproducing Copies of Field Sheets While in the Field	G. Goldsteen, Central Region
Modifications to Boston Whalers	G. Macdonald, Central Region
Sounding from Shore?	J.V. Crowley, Central Region
Code-Lite	A.R. Rogers, Central Region
* Canadian Power Squadrons	D.H. Lennox, Chief Commander, Hamilton Power Squadron

Training of Hydrographers	S. Van Dyck, Chief Training Officer, Marine Sciences Dir.
* Presentation	H.R. Blandford, A/Reg. Hydrographer, Central Region

Arctic Films

Polar Continental Shelf Project	G.E. Wade, Central Region
Russian North Pole Expedition 1966	H. Pulkkinen, PCSP, Ottawa
Hydrographic Application of the Search Sonar	R. Bryant, Central Region, Development Group

Arctic Films

Hudson 70, Phase 8 - The Arctic Voyage	Hydrographers' Association

Arctic Films

Russian North Pole Expedition - 1966	Hydrographers' Association
* U.S. Lake Survey Center (Detroit) Organization (N.O.A.A.)	W. Monteith, Chief, Surveys Branch

* *Luncheon meetings*

Two more seminars are proposed: R. Tripe, HYPOS and HAAPS Systems, and R. Bryant, LORAN C Trials; both speakers are members of Central Region's Development Group.

The Seminar Committee, consisting of Ed Thompson and myself, have appreciated the opportunity to further the interests of hydrography by organizing these seminars. A special note of thanks goes to the speakers and appreciation to others who helped -- especially the projectionists.

A. R. Rogers

E. Thompson

A. R. Rogers

E. F. Thompson