The SR.N2 Hovercraft has recently completed a series of demonstrations. This interesting vehicle, which so far has achieved speeds of 70 kts, and can accommodate sixty passengers, is equipped with both Decca Navigator and Decca Radar.

Inset: The cockpit of the SR.N2 showing the Decca installations on the starboard side.
EDITORIAL

As we go to press we learn that the Norwegian Storting has approved the setting up of Decca coverage along their western coast, extending as far north as the Arctic circle. The project calls for five Decca chains to be used primarily as a navigational aid for the Norwegian fishing industry.

In the crop of spring exhibitions Decca Navigator and allied equipment has been displayed in places as far removed as Seattle, Hanover, Poznan and Monte Carlo. At this latter exhibition Hi-Fix was demonstrated to most of the world’s hydrographers gathered for the 8th International Hydrographic Conference.

Our story of the successful recovery of the damaged cross-Channel power cable is evidence of the important part that a permanent Decca navigational chain can play in the many specialised operations that lie outside the sphere of routine navigation.

The evaluation of the Harco project for Eurocontrol is running according to plan. Equipment, including the Mark 1 Omnitrac computer and Mark 3 Self-setting Flight Log, has been fitted in a Potez aircraft of the Centre d’Essais en Vol at Bretigny and the flight trials programme has commenced and will continue for a period of some months. Later this year an aircraft of the Royal Aeronautical Establishment at Boscombe Down will be equipped to carry out very high altitude trials of the system.

With our eyes on Europe we have recently been participating in proving trials for the London-Brussels-Paris helicopter route which B.E.A. may fly with their new Vertol 107 helicopters.

The success of the Doppler 62 equipment continues. In this issue we publish a letter from British United Airways commenting on the successful trials of this equipment over a long period of intensive use under a tremendous range of climatic conditions.

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Important progress towards the establishment of the Decca Navigator System along Norway's west coast was made on Saturday the 17th March when a demonstration took place in Frederikshavn on board the Danish trawler Jens Christian Nordfisk. A number of Norwegian Government officials from Oslo, amongst which six members of Parliament headed by Mr I. K. Eikrem, Captain A. Groeningsæter, the representative of the Ministry of Fisheries Mr E. Aas, the representative of the Fishery Directorate Mr V. Dahl, Captain O. P. Araldsen of the Fishery Protection Unit of the Royal Norwegian Navy, Captain M. K. Skaar of the Naval Institute of Navigation and Mr K. Lundquist of the Norwegian Polar Institute, upon invitation from the Decca Navigator Co Ltd and accompanied by Mr F. I. Willoch, as Managing Director of the subsidiary Decca Company in Norway, took passage on the previous Friday night on the Oslo-Frederikshavn ferry. They joined the 120-ton steel trawler at Frederikshavn in order to gather first-hand experience with the Decca Navigator at sea.

Weather conditions were perfect when the vessel put to sea at 10 a.m. and a triangular track of about 30 miles was covered before she returned to harbour a few hours later. During that time the positions of various buoys were checked by Decca, and, simulating a trawling haul, a predetermined track followed with great accuracy on the Track Plotter. The demonstration gained an even greater sense of reality with the sudden appearance of fog which for some fifteen minutes limited visibility to a few yards. It was this fog which showed so clearly
the confidence of skipper Nielsen in his Decca equipment as he proceeded with unfailing certainty on his Decca chart to the next buoy which at exactly the estimated time loomed up only a few yards away. As he explained later, he had been using the Decca Navigator and the Track Plotter for the last 2½ years during herring fishing and he was convinced that apart from the greater safety aspects these aids had helped him to increase greatly his total catch during the previous year. As the Norwegian newspaper Arbeiderbladet quotes: 'Skipper Nielsen realised with his vessel during last year a gross income of Kr. 430,000 and he is convinced that without the Decca he could not imagine making it such a profitable operation'.

The demonstration left the visitors with a clear impression of the great potential merits of the Decca System for Norway's fishing industry as well as of its very useful aspects as a coastal and medium range navigational aid to shipping in general.

A luncheon in Frederikshavn where the Danish Decca Navigator Company acted as hosts completed this interesting day, and, as this article goes to press, the news has been received that the plan for electronic navigational aids for Norway which called amongst others for five Decca Chains was unanimously approved at a meeting of the Norwegian Parliament on the 19th May. This important decision is the first step towards the introduction of Decca in Norway and it is hoped that within a few years time Norway's west coast will be fully covered by Decca chains from its southern tip to the Russian border in the north.
During the summer of 1961 negotiations were opened with British United Airways with a view to fitting Decca Doppler in one of their troop-carrying Britannias. These aircraft have a very high utilisation rate and are currently operating between Gatwick and Entebbe in Uganda. Nav aids on this route are few and far between, the surface of the Mediterranean is frequently calm and the poor conducting qualities of the desert areas make it an obvious route to test any Doppler to its limits.

In due course it was agreed to fit a Britannia, the installation planning was commenced, and the ‘black boxes’ were finally fitted in October 1961. It is of interest here to note that owing to the high utilisation rate of these charter aircraft it was extremely difficult to ‘ground’ the Britannia long enough to get the Doppler installed, and the aircraft took off for Africa without carrying out a test flight for the Doppler equipment.

The performance of the Doppler equipment under these arduous conditions is summed up in the letter printed alongside.
DMP/KHA
Your ref: DGTH/T.

The Decca navigator Company Ltd.,
Air Division,
Decca House,
9, Albert Embankment,
London S.E.1.

For the attention of S/L D. G. T. Hayes.

Dear Sir,

Trial Installation of Decca Doppler Type 62.

The Decca Doppler Type 62 was installed in Britannia G-APMA for evaluation in October, 1961. This aircraft has been engaged upon scheduled services from Gatwick to East, Central and West Africa operating at altitudes varying between 18,000 and 35,000 feet.

After six months the Doppler has flown 1760 hours, during which time there has been no unserviceability of this equipment. Furthermore the total time spent "on memory" did not exceed 7% of the overall flight time.

As regards accuracy, under the flight conditions in which the Doppler was operated we are satisfied that the claims of the manufacturer were fully met.

Yours faithfully,
BRITISH UNITED AIRWAYS

D. M. Page,
Chief Navigator.
The Cross-Channel cable previously featured in our September 1961 issue recently suffered severe damage when it was fouled by a ship's anchor. This incident resulted in the withdrawal from service of the cable link and initiated an urgent fault-location survey and repair operation.

Decca played a vital role in these operations and was the basis of a decision which, if wrong, could have resulted in serious delay and additional costs of thousands of pounds.

The nature of the fault indicated the possibility of the cables being substantially displaced from their original position in the area of the damage which would considerably affect the planning of the cable repair programme. To establish the situation with certainty the m.f.v. White Seahorse was chartered and immediately fitted with the Decca Navigator and B.I.C.C. submarine cable search coil equipment. Special test signals from the cables were picked up at short range by the search coil which was towed over the ground, and the Decca co-ordinates were noted at the same time. The vessel used the original Decca Track Plotter chart which had previously recorded the track of the cable when it was originally laid.
and it was quickly established that the cable had indeed deviated from its known position. A methodical search of the area produced a large number of Decca positions of the cable and revealed a pattern which indicated a large bight in the cable track. This information completed the survey phase of the operation and the Decca equipment was then transferred to the cable repair ship Dame Caroline Haslett.

During the repair operation and before the damaged cables were lifted extensive use was made of skin divers. They had the particularly difficult task of attaching explosives to the cables under conditions of zero visibility, adverse tidal effects and at depths greater than 100 feet. The explosive charges would cut the cables and greatly reduce possible damage by strain as the cables were brought to the surface.

The Decca Navigator contributed greatly to the repair operation by facilitating a successful grappling contact on the first crossing of the cable and at the same time avoiding contact with adjacent cables in the area. Of even more importance, was the information from the Decca Navigator indicating that the underwater explosive charges had successfully cut the cables, which fact was registered by the drift in the ship's position of some 60 yards whilst still secured to the grappling line. This enabled the repair team to commence immediately with lifting operations rather than wait for the examination from the skin divers which would have taken valuable time allowing seawater to damage the cable.

The damaged section has now been relaid, using the Decca Navigator to check positions and as this article goes to press normal service has been resumed.
Among many vessels using the Decca Navigator in the Persian Gulf is this magnificent yacht Naief, owned by the Ruler of Qatar. An Arkas automatic pilot is also fitted.

A new demonstration aircraft, a Hunting 'Prince', has replaced the Anson which served the Company for over eight years. Up to eight passengers may be carried on demonstration flights, when as many as four separate Decca installations may be seen operating simultaneously.
A new executive aircraft fitted with Decca was recently commissioned by the National Coal Board. The aircraft, a De Havilland Dove 8 is already one of the busiest in Britain, and operates at a cost of about 7d. per passenger mile, 'less than the cost of a mini minor', according to its Captain Mr Basil Alum. Our photograph shows Lord and Lady Robens at the commissioning ceremony.

To meet the increased demand for Navigational Equipment this Company and Decca Radar Limited opened a new Sales and Service Depot in Glasgow on the 21st March. This depot is the principal Sales and Service Depot for Scotland providing facilities for the 1,100 Scottish-owned vessels which are Decca equipped.

Tremendous interest was shown in the Decca Navigator exhibit at the Century 21 Exhibition, Seattle, where Decca is featured in the U.K. Pavilion.

The Vickers VA3 Hovercraft, shown left, will inaugurate the world's first scheduled Hovercraft service this month between Hoylake and Rhyl—Navigated by Decca.
production and testing

Setting up a Wiedemann press—the birth of a radio chassis.

The punched chassis is taken from the press for folding.

The punched and folded chassis undergoes inspection.

Final assembly of a special Decometer display.

Testing a Mark 10 Decometer.

Further tests on a Decometer for marine use.

Final stages in the assembly of a unit which will have to operate for thousands of hours without attention.

Checking the assembly of an analogue computer.

Checking out a Flight Log display head.
Day by day our lives become more and more dependent upon electronics. From electronic computers for wage calculations to the complex systems in modern aircraft, the scope is unlimited. It is therefore more than ever essential that such equipment should be as reliable as modern methods can ensure.

On these pages we show some of the manufacturing and inspection processes which go to make Decca Navigator equipment among the most reliable in the world.

Checking a receiver case for accuracy.

Setting up a coil winding machine. These machines are specially adapted for the close tolerances required.

To ensure the necessary characteristics, coils are self-supporting and require special techniques in their manufacture.

Assembly nearing completion on a Decca chassis.

In order to test Decca equipment special test apparatus has to be designed and made.

In this and the previous picture test equipment is nearing completion.

The final inspection of a Mark 8 ATR computer.

Assembly of test gear in the laboratories.

The test gear used for checking a survey transmitting control rack.
HYDROGRAPHERS IN MONTE CARLO
Glittering in the Mediterranean sun, Monte Carlo has always been a centre of world-wide interests. With the passing of the years its fame has spread from its Casino and its International Holiday Centre to become a centre for international business. The Museum of Oceanography was founded there long ago and now, through the I.H.B., Monte Carlo has become a centre for hydrography.

At five-yearly intervals, hydrographers from all over the world have visited Monte Carlo for an interchange of technical information and for the co-ordination of the hydrographic interests of the various nations. This year the 8th meeting took place with representatives from no less than 38 nations taking part. The meetings commenced on the 8th May and lasted for 10 days during which time demonstrations of technical equipment were given by various manufacturers in addition to the discussions.

As a leading supplier of radio position equipment for hydrographic purposes, Decca regarded the occasion as one of great importance and a special stand was built in the Exhibition Hall provided by the International Hydrographic Bureau. Additional demonstrations of Decca equipment were given aboard a small launch which enabled hydrographers to see Decca equipment in operation.

At the Decca stand items of Decca equipment were on show together with illuminated panels describing the functions of the various systems. Brochures were available and a special tape recording device gave descriptions of Decca in eight different languages.

The stand included normal Decca Navigator, Two-range Decca, Lambda, and Hi-Fix equipment and announcements were made of two new Decca systems, ‘Mini-Fix’, a new miniaturised survey system, and ‘Sea-Fix’, a new survey system with the stations built in moored or free floating buoys.

On board the Gallus V, the demonstration launch, was a Hi-Fix receiver driving a Track Plotter. This launch was able to demonstrate the extremely accurate repeatability of the Hi-Fix system. Great interest was shown by many hydrographers, particularly the American, Canadian, Australian, New Zealand and Far Eastern representatives.

The launch which was using Hi-Fix in a two-range configuration, utilized transmissions from two Hi-Fix stations one at Cap d’Ail and the other at Monte Carlo Beach. It is interesting to note in passing that these stations were operating unmanned and that Decca personnel were in attendance only for the switching on and off of these stations.

In addition to the demonstrations given aboard the launch, Admiral Irving of the Royal Hydrographic Office invited the hydrographers aboard the Vidal, the Royal Navy’s new survey vessel which was in Monte Carlo for the conference. As the Vidal is equipped with Lambda equipment the observers were able to see the installation and had the opportunity of discussing with the officers the performance of the equipment which is now the standard two-range installation for the Royal Navy’s hydrographic surveys.

The conference provided an opportunity of showing Decca equipment under the most pleasing conditions and it is hoped that a similar demonstration will be possible at the time of the next International meeting.
The B.E.A. Helicopter Unit

carry out an evaluation of Decca for the proposed

London-Brussels-Paris helicopter service
The purpose of these trials was to establish the feasibility of the Decca Mark 8A lightweight equipment as the primary navigational aid for the intended London-Brussels-Paris scheduled helicopter service by British European Airways using Vertol 107’s.

The flying was carried out by the B.E.A. Helicopter experimental unit, and the trials themselves were the responsibility of M.o.A. CND3 (Control & Navigation Development).

The equipment, standard production Mark 8A and Flight Log, was installed in a Bell 47J. Fifty flying hours were allotted for these trials to be carried out in the London sector only.

A number of problems likely to be experienced in connection with this new helicopter service were investigated during these trials. All flying had to take place under similar conditions and designated tracks as might be used by the Vertol 107’s; radar coverage on the Paris leg between Mayfield and Battersea Heliport and the Brussels leg between Manston and Battersea Heliport were investigated; suitable ‘Gate’ position had to be established 10-15 miles east of the heliport over which climbs and descents to and from en-route altitude could be carried out. These were but a few of the problems that had to be investigated during the Decca trials. However, Decca accuracy was of prime importance.

The tracks and that portion of the Thames in and out of Battersea Heliport from the ‘Gate’ position were printed on the Flight Log chart. The scale of the river had to be large enough for the pilot to steer the ‘pen’ along the north bank going into the heliport and the south bank on departure.

A navigation officer from the M.o.A. was carried on each flight to maintain a continuous visual plot of the helicopter’s position on an inch to the mile ordnance survey map. During the early stages of these trials minor alterations such as the printing of additional information or varying the scale of charting were made and the various pilots who flew the helicopter were timed in their operation of the equipment. All this, and more, in order to try and establish some measure of ‘Navigator Accuracy’ and general performance. The results of these trials, now completed, will be issued by the M.o.A. and will include an analysis of the navigator’s plotting to establish the helicopter’s overall track-keeping accuracy. This will be done by measuring the lateral error at one nautical mile intervals over the whole route for each flight, further, an analysis of the deviation of the pen trace from the printed Flight Log track will be made, giving an indication of the pilot’s ability to maintain the required track on the Flight Log chart.

Although the official results have yet to be published it has been made known that the overall performance of the equipment was well within the required limits.
'After experience with the ARKAS Automatic Pilot during the very severe winter gales I have been amazed at its sterling performance. On one voyage passing Lands End towards the Smalls we encountered a severe westerly gale, force 10-11, with a very heavy and confused sea when the Arkas performed its duties with a very high degree of accuracy. Only twice did the vessel fall off 5 degrees when she was struck by exceptionally heavy seas, under the prevailing circumstances an experienced helmsman would have been hard put to have kept the vessel within 20-30 degrees of her course.

I find our speed is increased due to the Arkas ability to keep the vessel on a good course, and wear and tear of steering gear has considerably lessened. I am greatly impressed with this trouble-free instrument that increases ships efficiency.'

W. J. Jarvis, Master, m.v. Similarly.
At the end of the 19th century Frederick T. Everard, a barge builder of Greenhithe, saw that there was a greater future in barge running than in barge building. From these beginnings there has grown what must be one of the most progressive shipping companies in the world.

The company were first to introduce diesel power for coasters, and to introduce steam coils to permit hard oil to be carried in bulk instead of in barrels as had previously been the custom; they were also the first to provide a separate cabin for every member of the crew.

Today the company operates a large fleet of coasters and tankers on short sea routes, to the Baltic, Casablanca and the Mediterranean. The company also have other interests in oil storage, stone quarries, stevedoring, wharfing and in a liner company.

In 1948 F. T. Everard & Sons Ltd of Greenhithe took part in the Ministry of Transport Decca trials. Immediately after the official adoption of the system they equipped their fleet of coasters with Decca.

Fifteen years after pioneering the introduction of a new navigation system, they are once again among the first to install new equipment.

As a result of recent trials in m.t. Astrality they have ordered twenty Decca Arkas Autopilots for their fleet and will progressively fit over 50 vessels.

Reports from their masters during the trials tell of the increase in efficiency and speed, simplicity of operation and saving of labour brought about by the installation of this equipment.

As a link with the past, Everards still operate two sailing barges, the Cambria and the Will Everard, which at 280 tons d.w.t. is the largest Thames sailing barge built.

'Since fitting, the Arkas has operated with remarkable steering efficiency and has actually increased the vessel's average speed by 0.3 knots. This, combined with the amount of labour saved, is economy-plus.

On one occasion, recently, the vessel was hove-to for 36 hours, in a westerly gale. In those adverse weather conditions the Arkas equipment worked perfectly, keeping within 10 degrees of the set course. A splendid performance in this type of vessel and in my opinion, better than a helmsman.

The simplicity of operating the equipment is outstanding, being completely free of any complicated adjustments, its use has been quickly appreciated by the deck officers. The tiller steering has been especially useful in executing rapid manoeuvres and berthing the vessel.

I regard the Arkas Autopilot a most valuable addition to the vessel's equipment.'

J. C. Jewsbury M.I.N., Master, m.v. Supremity.
The four Decca Navigator chains in Canada form an important part of our world coverage for shipping. The Lambda equipment operating in the Canadian Arctic has also been particularly satisfactory. Now Canada evaluates Hi-Fix for helicopters and hydrography.
Canada has always played an important part in the development of Decca Navigation systems. The permanent coverage of the four Decca Navigator chains in Canada forms an important part of our world coverage for shipping, whilst the Lambda equipment operating in the northern latitudes has been particularly satisfactory.

Soon after the introduction of Hi-Fix some two years ago, equipment was sent to Canada in order that evaluation should take place in that country. As reported in the Decca Navigator News of July 1961, tests were carried out by the Canadian Hydrographic Office, the Department of Mines and Technical Surveys and the Marine Services Department of Transport. These demonstrations took place in October 1960 and representatives of the Royal Canadian Navy, the Dominion Hydrographer and the Polar Continental Shelf Project were present. Following reports of these representatives, orders were received last year for the supply of Hi-Fix chains, both for the Dominion Hydrographer but one was loaned to the Polar Continental Shelf Project.

For both requirements medium power Hi-Fix equipment was ordered. In March this year, two chains with full lane identification facilities (Duplex Operation with Lane Identification) were supplied. One chain was supplied with standard Hi-Fix Series III receivers whilst for the second chain, the receivers were of the Series III high-speed type. These high-speed receivers permit satisfactory operation at speeds up to 80 baseline knots and were necessary as the Polar Continental Shelf Project requires equipment to operate in helicopters.

Soon after delivery, an evaluation took place near the CDC plant at Bells Corner, making use of the Hi-Fix chain to assess the feasibility of towing a depth-sounding machine by a helicopter at a speed of 35 knots. This evaluation was successful and shows great possibilities for future development. The chain was then set up around the Kenney Strait and has just started actual operations with the helicopters.

The second chain is being used by the Canadian Hydrographic Survey on the coast of Nova Scotia and it will be moving off to Smith Sound later in the year. The operation will include an extensive evaluation and this will cover not only the application of Hi-Fix for survey work but also its suitability for minesweeper operations. It is hoped a great deal of valuable data concerning Hi-Fix performance in these areas will be collected and thus will assist in our planning the future operations.
Long before man learned to fly he had learned that getting from one place to another without becoming lost was quite a problem. The position relationship between 'here' and 'there' was very difficult to figure out unless the route of travel was very familiar and fairly short. Then when the flying machine came along, this problem of position fixing and navigation became even more obvious and needful of solution.

Back in the early days of barnstorming, when flying was done with goggles, white scarves, and the seat of the pants, various methods of position fixing and navigation were excellent topics for 'hangar flying,' but for little else. Soon, however, with more and faster aircraft filling the sky, the need for a pilot to know his exact location and how to get to his destination became an urgent matter. The military pilot in particular has a very special need for position fixing and navigation information. This is a vital tool of tactics to meet an endless variety of conditions in a constantly changing combat environment.

The increasing necessity for a reliable positioning and navigation instrument soon gave birth to all kinds of devices. An incomplete but somewhat historical list includes bonfires, en route lights, nondirectional transmitters, four-legged ranges, visual-omni-ranges, and radar. Each device led to further progress. In recent years specialized radar equipments, charts, and various other visual display types of equipment have been devised which gives the pilot a 'picture' that bears some resemblance to the terrain over which he is flying. All these visual type equipments are generally classified as pictorial display systems.
One of the most recent advancements in pictorial display is a system now being fabricated by Bendix-Pacific Division by the Bendix Corporation under contract to the United States Army Electronic Proving Grounds at Fort Huachuca. This system, labelled PFNS (Position Fixing and Navigational System—pronounced pffins), will soon be available to Army Aviation for evaluation. It is scheduled for delivery to Fort Huachuca early this year.

The equipment to be delivered for evaluation includes receiving systems for wheeled and tracked vehicles, map packs for the foot soldier, systems for aircraft, and is usable at speeds up to 750 knots. The PFNS system provides the pilot with a clearly visible moving map of the terrain below him. This map is mounted in the cockpit directly in line with the pilot's normal area of vision. The moving map represents the terrain over which the aircraft is flying. A stylus representing the aircraft automatically pinpoints the aircraft's position with uncanny accuracy.

PFNS, which does not depend on line of sight, is a low-frequency, area coverage, position fixing and navigation system which, for all practical purposes, reduces the terrain to fit right inside the pilot's cockpit. This enables the pilot to 'fly' the aircraft over the map—just as he would fly the aircraft over the ground. This is an area coverage system which does not require transmitters to be located near or on the point of intended termination of flight. The operating coverage spreads over an area of 150,000 square miles. Its low-frequency characteristic eliminates the stringent limitations associated with line-of-sight aids. The system is reliable on the ground, in valleys, behind buildings, hills or mountains. Its effective altitude coverage is unlimited.

The aircraft system offers two methods of utilization. One is manual plotting, whereby a continuous set of coordinates is read out to the pilot for reference to a map. The second method utilizes a moving map of the terrain with a stylus representing the aircraft's position. The stylus may inscribe the track made good for a permanent record of the flight, if this is desired. Pilots will be able to see designated holding patterns on the display. It will not be necessary for him to enter into mental gymnastics usually required for computing time outbound, time to turn, and other such factors. Pilots flying a tactical mission requiring treetop navigation will be able to see their present position and route ahead. Enemy concentrations may be plotted on the cockpit display and the stylus and aircraft flown around potential enemy groundfire. Night flights may be conducted over a completely blacked out area while the pilot has in front of him 'a picture' of the ground below him.

Helicopter vertical envelopments may be conducted with safe clear lateral aircraft separations at treetop altitudes. Flying to and from the drop zone will be a relatively simple task of 'flying' the stylus within a specified corridor which will be plotted on the cockpit display.

One of the greatest advantages of the system is its utilization in air traffic control. Airways may be changed or altered in a few minutes without concern to repositioning ground transmitters. Reporting points and holding patterns may be added or deleted at the discretion of the ATC without significant thought to transmitting location. Because of the system's nondependence on line of sight, ATC can control the entire area for a field army from ground level up.

Weight is always a prime consideration in airborne equipment. PFNS receivers are lightweight and compatible with Army weight requirements. Manpack receivers for the foot soldier weigh 21 lbs. Transmitters are completely transportable by light cargo helicopter and can be erected, ready for operation, in less than 4 hours. It can be dismantled in 2 hours.

A unique system of leapfrogging the transmitting stations permits operation for an indefinite period of time to provide continued coverage during a break-through or fast moving combat situation. One chain of transmitting stations will provide en route and terminal guidance facilities to every point within a 150,000 square mile area. In fact, using the Korean operations as an example, one set of transmitters would give coverage over most of the entire peninsula. This would permit every airfield, including company level helipads, to have en route and terminal aid navigation facilities.

* Bendix-Pacific are licensees of Decca Navigator System Inc.

### OPERATIONAL TO USERS

Since the last edition of the Decca Navigator News the following Admiralty charts have been published.

**New Charts**

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<td>L(D) 191</td>
<td>North Sea</td>
<td>1:50,000</td>
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<tr>
<td>L(D) 305</td>
<td>Gulf of St. Lawrence, Little Mercantia I. to St. Genevieve I. including S.E. portion of Anticosti I.</td>
<td>1:300,000</td>
</tr>
<tr>
<td>L(D)1177</td>
<td>England E. coast. The Wash, approaches to King's Lynn.</td>
<td>1:25,000</td>
</tr>
<tr>
<td>L(D)2205</td>
<td>St. Lawrence, River Entrance, St. Genevieve Island to Pte. des Monts, including the North West portion of Anticosti Island</td>
<td>1:300,000</td>
</tr>
<tr>
<td>L(D) 283</td>
<td>W. Coast of Newfoundland, Codroy Road to Cow Head Harbour</td>
<td>1:249,000</td>
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<td>L(D) 307</td>
<td>River St. Lawrence, Pointe des Monts to Father Point</td>
<td>1:150,000</td>
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<tr>
<td>L(D)2705</td>
<td>France, N. Coast, Cap Frehel to Pte. de la Houle</td>
<td>1:50,000</td>
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<tr>
<td>L(D)1132</td>
<td>Gulf of St. Lawrence, Mingers Channel</td>
<td>1:75,000</td>
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<td>L(D)1135</td>
<td>River St. Lawrence, Seven Islands Bay</td>
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<tr>
<td>L(D)2658</td>
<td>Lannion to Erquy, including Guernsey, Sark and the Casquets</td>
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**New Editions**

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<tr>
<td>L(D)284</td>
<td>Gulf of St. Lawrence, Cow Head Harbour to St. Genevieve Bay</td>
<td>1:240,000</td>
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<tr>
<td>L(D)338</td>
<td>Wales, Barmouth to South Stack</td>
<td>1:72,800</td>
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<td>L(D)2034</td>
<td>Gulf of St. Lawrence, Northumberland Strait</td>
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**Large Corrections**

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<td>England E. coast, approaches to Great Yarmouth and Lowestoft</td>
<td>1:37,500</td>
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<tr>
<td>L(D)112</td>
<td>North Sea. Zeegat van Terschelling and approaches to Harlingen</td>
<td>1:50,000</td>
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<tr>
<td>L(D)1127</td>
<td>England, S. Coast, Dodman Point to Start Point</td>
<td>1:75,000</td>
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**The Canadian Hydrographic office have published the following:**

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<td>Northumberland Strait</td>
<td>1:300,000</td>
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<tr>
<td>L(D)4040</td>
<td>Tyrone shoals to Cape Egmont</td>
<td>1:75,600</td>
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<tr>
<td>L(D)9125</td>
<td>Pointe des Monts to Saguenay River</td>
<td>1:260,000</td>
</tr>
<tr>
<td>L(D)4480</td>
<td>Cape Whittle to Anticosti Is. (West Pt.)</td>
<td>1:354,500</td>
</tr>
</tbody>
</table>

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