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Report on visit to R.D.F group at Esquimalt, B.C. Smith, H. D.

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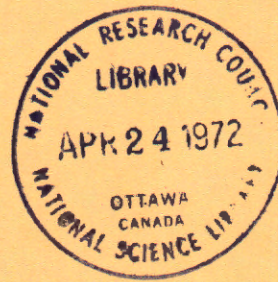
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THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER, CANADA

DEPARTMENT OF PHYSICS

Report on Visit to R.D.F. Group at
Esquimalt, B.C. made at the Request
of Dr R.W. Boyle.

At the request of Dr R.W. Boyle,
Director, Division of Physics and Electrical
Engineering, National Research Council,
Ottawa, the writer visited the Navy
R.D.F. group at H.M.C. Dockyard,
Esquimalt B.C. on October 24th - 25th,
1942. Discussions were held with
Lieut. J. Moon, in charge of R.D.F.
installations at Esquimalt, Lieut.
Coy, who is responsible for maintenance
of R.D.F. equipment, and Lieut Schierbeck,
R.D.F. officer at Prince Rupert, B.C.,
who was visiting the Esquimalt Base
at the time. In addition, a
number of installations were examined,
and one unit, - type SN3C, situated
on a fairmile was observed in
operation.

The following information was

gained during the visit, -

Installations to date

Fifteen installations have been made to date, consisting of three SW1C, eight SW2C and four SW3C units. As far as is known all units are still in operation although no report has been received on the performance of sets on ships sent to Prince Rupert, the Aleutian Islands, and other distant points. The SW1C and SW2C sets have been installed on PT Type corvettes, and on minesweepers, while SW3C units are being used on Fairmiles. Antenna heights are 45 ft. above the water line for the first two types, and approximately 20 ft. above the water in the case of the SW3C installations.

The R.D.F. group is fortunate in having excellent targets available for calibrating and checking sets when the ships are in dock. Local ranges of hills provide targets at 4000 and 8000 yds., while the Olympic Mountains in the State of Washington, across the Strait of Juan de Fuca

provide clear-cut targets at 36000 and 40000 yd. All four calibration targets give echoes to cut-off on the C.R. tubes, when the set is functioning properly. All sets are checked against these targets before and after test runs are made with new installations.

Performance of Various Units.

Lieuts. Coy and Moon report that on a corvette in open water, (that is, at least 2 or 3 miles from steep mountains or cliffs that would give rise to a "back-echo" interference) one is fortunate to detect a 10000 ton merchant ship at any distance over 8000 yd. Instances have been recorded in which such a target has been picked up at 10000 - 12000 yd, however.

At Esquimalt few tests have been made with planes as targets, but aircraft have been followed to distances of 20 miles.

Tests with the SW3C units on Fairmiles have shown that, under average conditions, another Fairmile can be picked up at 2000 - 3000 yd., while a 10000 ton merchant ship may be detected at 4000 - 5000 yd. Aircraft have been observed at 36000 yd. and mountains at 40000 yd. In exceptional case quoted

was that in which a SW3C picked up a 4 ft. diameter log floating on the water at a distance of 3000 yd.

On only one occasion have tests been carried out on a surfaced submarine. A U.S. sub was detected at 3000 yd. by a SW2C unit on a minesweeper.

Lieut. Schierbeck, R.N.R. officer from Prince Rupert, who was visiting the base had made only a few tests on surface craft, but had obtained ^{results} in substantial agreement with the work at Esquimalt. He was very enthusiastic however, about the tests on planes, made near Prince Rupert with a SW2C installed on a minesweeper. He had conducted a careful series of trials with R.C.A.F. blimps, sharks, and had picked up his targets at an altitude of 9000 ft., 18 miles from the ship. He had obtained a considerable amount of data, had plotted curves, etc., and offered to write up and send his results to the Navy Section at N.R.C., if they ^{are} were interested.

As navigational aids in fog and darkness the sets were highly praised by the R.N.R.

Officers. During the patrolling of the narrow-channels and inlets of the Coast between Victoria and Prince Rupert, the R.D.F. equipment has been found extremely useful. A recent case was cited in which one of their mincweepers returned to the base through a very dense fog, depending almost entirely on its SWL unit, but land was not sighted during the trip.

Comparison with performance of British sets & similar type

Lieuts Coy. Moon and Scherck, drew comparisons between the sets installed here and the British sets used by them during the period May 1940 - May 1942, when they acted as chief R.D.F. officers on various ships of the Royal Navy. They were of the opinion that the sets being installed here were very similar to the British 286 PQ, but thought that this British set was superior to the Canadian unit in detecting surface ships. They stated that the 286 PQ could locate 10000 ton merchant ships and light cruisers with ease at 10000-12000 yd. (Antenna height above water was not given - H.D.S.). In detecting planes

both sets gave equally good results. Lieut. Roy attributed the success of the British unit in surface work to the fact that it was a higher-powered set, and suggested that the tubes now used in the Canadian units might be operated successfully and efficiently at a considerably higher voltage than the 8KV (1) used at present. For example, the same tubes used in the transmitter of the English 285 sets are operated at 12KV or even higher voltages.

Comments on Present Equipment.

All three Officers praised the mechanical design and construction of the present sets, mentioning particularly the accessibility of the various components of the sets, and the comparatively small amount of servicing required to keep everything in good running order. The blower motors have been giving trouble, but R.E.L. has taken steps to remedy this defect. The antenna rotating mechanism on present sets does not permit the operator to obtain high bearing accuracy. However, the recent work carried out by the Navy R.D.F. staff in

Ottawa on a new antenna drive is expected to provide a solution to this problem. On the other hand, the range accuracy was more than sufficient for the guns on the Fairmiles, corvettes and minesweepers being fitted with R.D.F. equipment at Esquimalt.

All things considered it appeared to be the consensus of opinion that the sets were well designed and well made and were of particular value as navigational aids and in locating planes, but that an increase in range for surface craft detection was desirable.

Report

H. D. Smith

P.S. According to the one wavemeter possessed by the Esquimaux Group, the sets received from R.F.L. transmit at a frequency about + MC too high, that is, at 218 MC instead of 214 MC. Perhaps a new wave meter could be provided by the Navy or R.F.L. for checking reasons?

It might be helpful to send the results of any tests carried ^{out} on surface craft, ^{with 5 MC. etc} by N.R.C. or the Navy or Halifax to Licent's Room + Log. This is merely a suggestion - Perhaps they have already been provided with this data

R. S.