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Contract Nonr-609(02)
covering the period
1 April 1954 to 30 June 1954

30 June 1954
Edwards Street Laboratory
Yale University
New Haven, Connecticut

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SUMMARY REPORT

1. This last quarter of the fiscal year 1953-1954 has produced more study and planning than concrete results reported during the period would indicate. Early in the quarter the firm intention of ONR to extend Contract Nonr-609(02) for an additional year was announced (on 20 April) and a good deal of administrative effort was spent from then on in recruiting new full-time personnel and in arranging for extensions of existing commitments to faculty members, student assistants and others who had only been promised employment until 31 May or 30 June. The recruitment effort was only partially successful, as will be evident from examination of Annex A, concerning Personnel.

2. Negotiations for appointment of Dr. Andrew Patterson, Jr., as the new Principal Investigator and Director of the Edwards Street Laboratory during the fiscal year 1954-1955, under special arrangements as to salary, were successfully completed on 29 June. Meanwhile the transfer of responsibilities from Dr. McKeehan to Dr. Patterson proceeded smoothly to completion on 30 June. As suggested in the last Quarterly Progress Report, Dr. McKeehan will remain available on a voluntary basis, for occasional services.

3. The physical abandonment of the Beavertail Laboratory proceeded as planned. Dates of importance were 19 April when pick-up of underwater installations off Beavertail Point was

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completed, 21 April, when the hut at Ft. Getty was returned to the Naval Radar Facility, 22 April when the radar dish on the high tower was brought to earth, 21 May when Building 9 at the NRF was vacated by the Contract, 26 May when the underwater installation east of the northern end of Conanicut Island was picked up, 21 June when the last material charged to the Contract left the NRF for shipment from the Naval Air Station, Quonset Point, and 30 June when the Harbor Defense Research Unit was disestablished and Lt.Cdr. N.H. Prade vacated the HDRU office in Building 9.

4. Arrangements for field work during following quarters in the New Haven area or elsewhere including services of a small vessel, the VIRGINIA, heretofore used by the Narragansett Marine Laboratory under other ONR contracts, began to take shape during June, but were still incomplete at the close of the quarter.

5. The two meetings of the Mine Advisory Committee during the quarter, held on 12-14 May in the Washington area, and on 28-30 June at the Woods Hole Oceanographic Institution, and attended by Dr. McKeehan, considered matters of direct interest under the Contract. Liason with the Navy Electronics Laboratory continued to be close, as will be noted from details presented in Annex B. Liason with the Navy Radiological Defense Laboratory also continued, furthered by a visit thereto by Drs. Watson, Hutchinson and Rall on 20-21 May.

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6. The only active sub-contractor, Melpar, Inc., has prepared a draft of its final report, which has not yet been approved for formal submission.

7. It is regretted that the services of Prof. C.W. Miller, of Brown University, employed under the Contract since 1 June 1952, terminated on 31 May 1954 before any action had been reported to him or to us regarding our application for his SECRET clearance.

8. In concluding his last Quarterly Progress Report the retiring Principal Investigator wishes to express his appreciation of the loyal support of his colleagues employed under the Contract during the past three and one-half years and to assure the Office of Naval Research that the new Principal Investigator and all his staff are well qualified to forward the tasks they have undertaken.



L. W. McKeehan
Director

Contract Nonr-609(02)

Progress Report

30 June 1954

ANNEX A

Personnel

Working days paid for by Contract. (Figures after dash are working days at Beavertail Laboratory 1 April to 21 May, inclusive or at Naval Radar Facility 22 May to 30 June, inclusive.)

	Apr.		-1954- May		Jun.			
<u>Administration-General</u>								
1. L.W. McKeehan	12.5	-	5.5	12	- 5.5	12.5	-	5.5
2. A. Patterson, Jr.	4			3.5		13		
3. Maude Purdue	22			22	- 1	22		
4. R.V. Vallera	20	-	3	19	- 6	20	-	1
5. Virginia Withington	22	-	13	21	- 7	22		
<u>Administration-Beavertail</u>								
6. Miriam Newbauer	22	-	22	21	- 21	12	-	12
<u>Technical Service</u>								
<u>Supervision</u>								
7. C.S. Robinson	22	-	17	21	- 6	22	-	2
<u>Technical Staff</u>								
8. R.E. Barrett	22	-	1	21		22		
9. E.R. Beringer	-----			-----		-----		
10. C.H. Dench	4	-	1	9.5	- 7.5	10	-	6
11. A.A. Evett	5.5			5.5		5.5		
12. H.A. Fairbank*	-----			-----		-----		
13. W.R. Guild	5.5	-	1	5		5.5		
14. F. Hutchinson	5			4.5		6		
15. C.T. Lane	3			3		3		
16. H.A. Lepper, Jr.*	-----			-----		-----		
17. C.T.G. Looney*	-----			-----		-----		
18. J.K. Major	5.5			5.5		14		
19. H. Margenau	2.5			2.5		2.5		
20. C.W. Miller	3.5	-	2.5	3.5	- 2.5			
21. L. Onsager	2.5			2.5		2.5		
22. W.C.G. Ortel	22	-	5	21	- 9	22		
23. G.F. Pieper, Jr.*	-----			-----		-----		
24. E.C. Pollard	3			2.5		5		
25. W. Rall	5			4.5		5		
26. F.G. Robley*	-----			-----		-----		
27. H.L. Schultz	3.5			3.5		3.5		
28. W.W. Watson	2.5			2.5		12.5		
29. M.L. Wiedmann	3.5			3.5		3.5		
30. H.J. Wiens	4.5			4		4.5		

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	Apr.		-1954- May		Jun.
<u>Technical Assistants</u>					
31.					18
32.	22	-	1	21	
33.					18
34.	12			11.5	17
35.	12			11.5	17
36.	12			11.5	12
37.					11
38.					18
39.	12			11.5	
40.					7
41.	7.5			10.5	1.5
<u>Technical Service Assistants</u>					
42.	22			21	- 3
43.	11	-	3	10.5	
44.	22	-	2	21	22 - 1
<u>Clerical and Custodial Service</u>					
45.	22			21	- 1
46.	22			21	
47.	22			21	
48.	11				
49.	22	-	22	21	- 21
50.	22			21	
51.	22			21	
52.	22	-	22	21	- 21
					5 - 5

*Unpaid

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ANNEX B

REVIEW OF SUB-PROJECTS AND OF RELATED
ACTIVITIES

1. ARRANGEMENT OF SUBJECTS

The numbered and lettered heads and sub-heads of this review are arranged in the order used in the last quarterly progress report, except as indicated.

2. LONG-RANGE LOCATION OF AIRCRAFT-LAID MINE ENTRY POINTS

a. Radar Mine-Spotting

(1) It was intended, at the close of the last quarter, to dispense with further mine-drops for the rapid scan selected sector radar set on the high tower at Beavertail, and the components of the set had been disconnected.

When, on 7 April, it was decided to stage a demonstration for the Navy Electronics Laboratory on 20 April. This was done, the test being viewed by I.L. Emig of NEL, and D.F. Ream of BuShips. After discussion of NEL and BuShips interest in this subject the shipment of the radar to NEL was authorized on 11 June. The components are now at NAS, Quonset Point. Shipment is awaiting the availability of an extra wide railroad flat car.

(2) Laboratory work on the distance-only non-scanning radar is proceeding at the Edwards Street Laboratory. Field tests are planned to be conducted at the Naval Reserve Training Center in New Haven and the Commandant

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of the Third Naval District has authorized this use of the local Naval facilities.

b. Photographic Mine-Spotting

Construction and test of new clocks is still not completed.

3. MEDIUM-RANGE LOCATION OF AIRCRAFT-LAID MINE ENTRY POINTS

a. Sound-Ranging

Equipment at Beavertail was salvaged, but not all hydrophones and cables were recovered. All salvaged cable (a special design of 7-pair cable) has been transferred to USN/USL, New London. A paper on this subject was presented at the Ninth Underwater Sound Symposium in Washington on 17 June. (See Annex C.)

b. Sono-Sono Spotting

As noted in the Summary Report the sub-contractor on this technique has not yet produced a satisfactory report on feasibility and design parameters.

4. MEDIUM-RANGE LOCATION OF PLANTED MINES

a. Leader-Locator Cables

Closed out as an active sub-project.

b. Sonar Search Gear

Closed out as an active sub-project. Proper sonar

equipment of a small mine-hunting boat is under study.
(Study Group Seminar of 25 May discussed this topic.)

5. SHORT-RANGE LOCATION OF PLANTED MINES

Nothing to report except that short-range location equipment will probably be included in specifications for a small mine-hunting boat. (Study Group Seminar of 25 May discussed this topic.)

6. NAVIGATION BY MINE-COUNTERMEASURES VESSELS

A study of relative advantages and disadvantages of various methods is in preparation. No experimental work is planned except in connection with other needs for 2.a.(2) and 2.b. (Study Group Seminar of 25 May discussed this topic.)

7. ACTUATION OF MINES BY SHIP-SIMULATORS

(Pressure-Mine Sweeping)

A Study Group Seminar on 4 May was devoted to this problem. It was led by Drs. Margenau, Lane and Ortel and reviewed all known methods of any promise.

a. Vertical Vortex Sweep

The report on this sub-project has not yet been completed.

b. Bubble Sweep

Closed out as an active sub-project.

c. Pressure and Flow Measurement

Field work on this sub-project continued at Station

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OUT on the east side of the northern end of Conanicut Island until just after the middle of May. Flow and pressure data were obtained for several passages of aircraft carriers, of different sizes, entering and leaving the channel to NAS Quonset Point. The report is not yet completed.

8. NEUTRALIZATION OF MINES

No progress is to be reported except that equipment of a mine-hunting boat for "hand" neutralization of mines by swimmers was mentioned as possibly desirable in the Study Group Seminar of 25 May, and a special Study Group Seminar on this phase of neutralization is being arranged for the latter part of July.

9. STUDY GROUP ACTIVITIES (New)

Several references to Study Group Seminars have been made in previous paragraphs. The meetings of the Study Group during the quarter are noted here:

6 April: Anti-Submarine Warfare, with emphasis on the tracking of submarine mine-layers in deep water. The principal speaker was Capt. A.L. Shepard of the Naval War College.

13 April: NEL Activities, with emphasis on underwater sound. Those who visited NEL in March (Drs. Watson, Hutchinson and Guild) reported on

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different phases of ESL-NEL joint interest.

- 27 April: Consideration of program changes made necessary by Contract extension. This was a general planning session attended also by Lt. P.R. Newcomb of ONR(463).
- 4 May: Pressure Mine Countermeasures. This review was conducted by Drs. Margenau, Iand and Ortel.
- 25 May: Mine-Hunting Boat Equipment. The Committee of the Study Group which is working on this problem presented a kind of interim report. Discussion was led by Dr. Major (Chairman of Committee). Cdr. F.B. Tucker, Cdr. A.E. Lundgren and Lt. P.R. Newcomb, all of ONR(463) attended this meeting.
- 21-23 June: Review of Progress and Plans for Future Work under the Contract. This meeting had seven technical sessions including one during the evening of 22 June. Its report will soon appear and summary of its proceedings, report on which is being prepared by a special committee, will not be attempted here.

ANNEX C

ESL Technical Reports and Memoranda

(None issued during the quarter. Several are in preparation and may issue as appendices to a more comprehensive report of work under the Contract since its inception)

Special Reports

Patterson, A., Jr., and Elliott, S.D., Jr., "Acoustic Disturbances Produced by Dropping Missiles into Water." (Abstract of paper presented at the Ninth Navy Underwater Symposium, Naval Research Laboratory, 18 June 1954)
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(The paper has been submitted for publication in the Journal of Underwater Acoustics)

McKeehan, L.W., "Progress Report, Contract Nonr-609(02) Covering the period 1 April 1954, to 30 June 1954" (ESL:100:Ser. 0696) dtd 30 June 1954.
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