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QUARTERLY REPORT OF THE APPLIED ENGINEERING DIVISION, JANUARY ---ETC(U)
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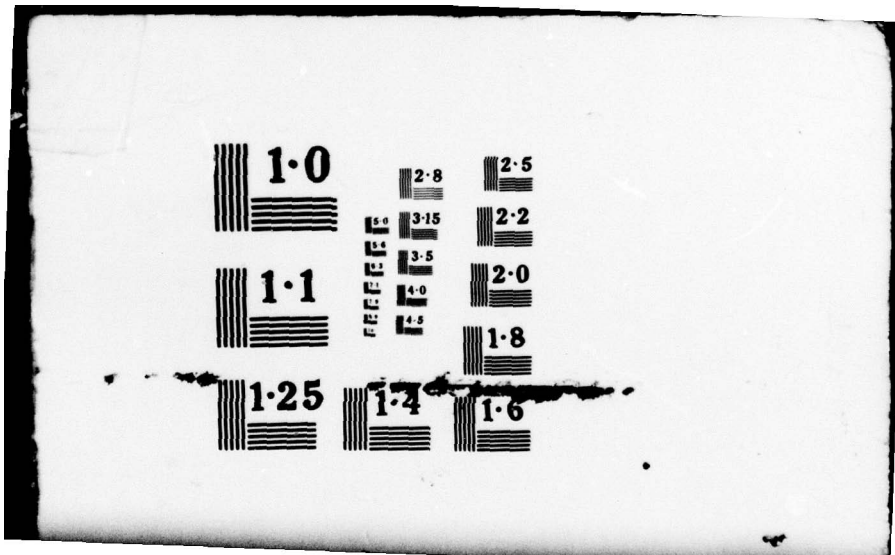
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LEVEL II

MOST Project -4

TM No.
EA31-30-73

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NAVAL UNDERWATER SYSTEMS CENTER
New London, Connecticut 06320

14 NUSC-EA31-30-73

9 Technical Memorandum

1973

JANUARY/FEBRUARY/MARCH

QUARTERLY REPORT OF THE APPLIED ENGINEERING DIVISION

6 Quarterly Report January-March 1973

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AN/BQR-7() SYSTEM IMPROVEMENTS

T11000

Joseph Zirin

The polyethylene encapsulated BQR-7/DT-276 hydrophones have been sent to NRL/USRD for receiving response tests at variable temperature and pressure. These tests will complete the evaluation of these hydrophones.

The Ithaco BQR-7B Coupling Amplifiers have satisfactorily met the specification requirements after re-submission. These coupling amplifiers are acceptable for use in the AN/BQR-7B.

The Melcor BQR-7 Equalization Amplifiers are not acceptable. The test for distortion showed that these amplifiers exceeded the specification limit. The amplifiers have been returned to Melcor for correction. Code EA311 has been informed by Melcor that the company is unable to correct the problems and intends to withdraw from military product contracting.

The DSS-3 cable shield evaluation will commence during the third week of April 1973.

The Interface Device documentation has been completed and issued to the interested assembly groups. A new version containing eight outputs has been designed and has been accepted by NAVSHIPS PMS-302-1. It is planned that the eight output device will be the desired interface device for installation aboard ship.

The ATF yoke field change kits are being produced by the vendor. One complete set of pieces have been received by NUSC, Code EA33 for inspection purposes. The original plan that entailed issuance of this kit as one complete assembly that could be installed by Ship's Force has been changed because of technical problems that surfaced when federal stock items were received. It has been determined that these stock items need work to prepare them for inclusion as integral parts of the assembly. The new plan is to train shipyard and tender personnel to handle this field change installation.

The ± 28 vdc regulated power supply field change package to replace chassis 6A2 will be manufactured by Edo Corp. The vendor will produce 40 kits for \$98,000. and testing will be completed by early October. Installation of one kit will be accomplished into an NUSC available AN/BQR-7B system for test purposes. If these tests are satisfactory a ship installation will be accomplished.

Visits to thirty-three ships have been completed. The problems and component discrepancies have been noted visually and crews have been queried about the systems.

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AN/BQR-7() SYSTEM IMPROVEMENTS (cont)

T11000

Commencing July 1, 1973 NUSC Code RA41 will undertake responsibility for the AN/BQR-7() System Support Program. Mr. Willis Lawler, Code RA416 will become Principal Investigator.

AN/BQQ-5 IN-PLANT TEST SUPPORT

T12051

Willard C. Schimmel/Richard O. Carson

Activity of the AN/BQQ-5 In-Plant Test Support Group during the months of January, February and March included a DSARC TIGER TEAM meeting at IBM, Owego, N.Y. on 3 January 1973. The purpose of the meeting was to discuss SDCT status and assign priorities to the remaining tests.

A meeting was held at PMS-302, NAVSHIPS on 24 January 1973. Representatives of NUSC, IBM, EB and NAVSHIPS were in attendance. The purpose of the meeting was to discuss mounting of Units 7/124 and 5 on a submarine. The 3-D mock-up at Newport News has been inspected and the specifications have been reviewed. The 7/124 problem should be resolved and reported on in the near future. The Unit 5 mounting problem will be acted upon after completion of side to side vibration testing.

A Joint Test Group meeting was held at IBM, Owego, N.Y. on 14-15 February 1973. The main topics of discussion included the surface inspection of Unit 119, Serial No. 3; status of open items; discrepancy report summary sign off on Units 119 and 176; preproduction test status; structureborne/airborne noise ECP; preproduction test plan and discussion of ISN 11; FACR plans and schedules; reliability demonstration test prerequisites, plan update and PM/FL software status; SDCT test status and plans for completion; systems test procedures, in-house verification and system test matrix; sonar target simulator, sea states, and dynamic range; shipyard test procedure and lack of interlock on Unit 5.

Representatives of NUSC and Raytheon met at Portsmouth, R.I. to discuss the unresolved test malfunction reports. Preliminary agreement has been reached in all but one, which will be discussed after inspection of the recommended fixes in the hardware.

A Joint Test Group meeting was held at IBM, Owego, N.Y. on 14-15 March 1973. The main topics of discussion included surface examination discrepancies; preproduction test status; system preproduction procedure schedule; sub-contractor test status; status of Government review of updated T.M.I.s; reliability demonstration test plan - discussed Government comments on base line test; STP schedule and format - NUSC comments on material reviewed for source documentation; SDCT plans and schedule, P.I. test matrix; distribution of D.R.s and PM/FL discussions.

Acceptance testing of the Passive Beamformer, Serial No. 5 was completed at Hughes Aircraft Co. of Fullerton, California.

AN/BQQ-5 IN-PLANT TEST SUPPORT (cont)

T12051

Precision Data Recorder No. 5 passed acceptance tests at Raytheon, Portsmouth, R.I. and has since been shipped to IBM, Owego, N.Y. Airborne acoustic noise tests were conducted on this Unit at IBM, Glendale, N.Y. according to the revised requirements; the results were within specifications in 3 of the 6 positions.

The classification SDCT has been completed at IBM, Owego, N.Y.; the passive broadband, DIFAR LIKE and active functions SDCT are still in progress. Unit 116 SDCT has been completed; passive concurrency 3 IMC (informed) has been completed; Unit 5 and 170 surface inspection has been completed.

At IBM, Owego, N.Y., the PM/FL console unit level tests, magnetic drum storage inclination tests, and Unit 111 airborne acoustic noise test have been completed.

A retest of the ECI produced FS/FL printer at TII, College Point, L.I., N.Y. revealed no appreciable improvement in the structureborne noise levels as compared with previous test results. The medium weight shock test of the printer has been completed and will be considered to have passed shock testing upon resolution of several minor discrepancies.

At E.C.I., St. Petersburg, Florida, the FS/FL (fault status/fault locator) Printer enclosure test has been completed. The first attempt failed due to a faulty R.F.I. gasket. After replacing the gasket, the second test was successful.

Vibration of Unit 178 was completed at IBM, Owego, N.Y. on Wednesday, 21 March 1973. The Unit was then shipped to T.I.I., College Point, N.Y. for shock tests. Shock tests were completed on 27 March 1973. A number of D.R.s must be resolved before the final acceptance of Unit 178 through shock and vibration can be made.

Two hundred hours of salt spray testing has been satisfactorily completed on an AN/BQQ-5 representative sample at IBM, Owego, N.Y.

MULTI-PURPOSE SUBSYSTEM (MPS) AN/BQS-13 TEST & EVALUATION

C12300

Willard C. Schimmel

During the period January - March 1973, no environmental tests were performed on the MPS; several meetings were held to discuss the present status of the program and plans for the future. The emphasis of the meetings was on possible problem areas, both for equipment and testing, and acceptance criteria. The preproduction contract, for two systems, was awarded 21 February 1973.

MULTI-PURPOSE SUBSYSTEM (MPS) AN/BQS-13 TEST & EVALUATION (cont) C12300

Currently, the first system is scheduled for completion on 15 OCT 1973. System test is scheduled to begin 15 AUG 1973. The Console (Unit 2) Environmental testing will probably begin the first of the year (1974) rather than the 1 SEP 1973 called for in the contract.

TUBA IMPROVEMENT PROGRAM SUPPORT

A12600

A. Michael Schindler

AN/BQS-8 Array Evaluation

During the past quarter, the following progress was accomplished:

1. The contract let to Edo Corp. to design and construct interface electronics to slave the AN/BQS-8 compensator to the AN/BQS-12 compensator was completed. This unit will be installed aboard SSN 637 prior to mid-June sea trial.

2. A reference omni hydrophone was obtained from NISC for loan during sea trial. The hydrophone is an Ametek/Straza SB161CA-2. It will be mounted on top of the sail on the AN/WLR-9 multi-mode hydrophone foundation. The Engineering Division is planning the hydrophone installation including all associated cabling. The installation will take place in mid-May.

TRIDENT SONAR TEST & EVALUATION

A18002

Richard O. Carson

Trident

Quality assurance provisions of the prime item development specifications are in the process of review and study. This effort is in preparation for contractual negotiations.

A matrix sheet has been prepared which lists all sub units as part of the overall Trident Sonar System. The matrix will provide progressive information concerning each individual sub unit status.

TRIDENT COMPONENT SHOCK QUALIFICATION PROGRAM

A18015

Edward G. Marsh/Richard R. McNamara

Continued work on the Government Furnished Equipment (GFE) list resulted in a second issue being distributed under NUSC letter Serial

TRIDENT COMPONENT SHOCK QUALIFICATION PROGRAM (cont)

A18015

Serial EA31-20. The response from this publication is very encouraging and indications are that much of the equipment is, or will be, shock qualified.

A solid foundation for the proposed Submerged Shock Test Vehicle (SSTV) test at NSRDC/NERD at Norfolk, VA in 1975 has been set. This test concerns an underwater shock test of the Trident fairwater and all of its equipment, along with two missile tube hatches. Equipment for the test has been made available, and scheduling set ups for its procurement and installation. Cost estimates are presently being calculated and a complete proposal package will be presented to PMS-396 for funding consideration in fiscal years 1974 - 1975.

AN/BQN-17 (XN-2) PROCESSOR AND RECORDER TEST & EVALUATION

C19201

Willard C. Schimmel

The status of events for the BQN-17 (XN-2) for the period January - March 1973 is as follows:

A Maintainability Demonstration was performed on the BQN-17 (XN-2) System 1 at Raytheon, Portsmouth, R.I., during the period 11-17 January 1973. The purpose of the test was to demonstrate a meantime-to-repair (MTTR) of 1 hour as specified in the AN/BQN-17 Performance Specification.

The system under test was located in Bldg. 3 at Raytheon, Portsmouth, R.I. The repair actions were performed by a technician who was mutually acceptable to Raytheon, NUSC/NL and NAVSHIPS PMS-302-153.

It was determined that the 1-hour MTTR requirement was successfully demonstrated. The geometric and arithmetic MTTRs were calculated to be 0.40 and 0.76 hours, respectively.

As a result of a reported heat problem in Unit 1 (receiver-transmitter cabinet) a trip was made to the USS TREPANG SSN 674 to verify heat study measurements performed there by the contractor. The system has since been sent to Raytheon where further studies will be made.

Preproduction testing is to start late in April.

AN/BRD-7 TEST & EVALUATION

K55203

Alexander J. Santos/Edward G. Marsh

A review of the Preliminary Qualification Tests has been made. The comments will be discussed with the contractor and the necessary changes to the procedure will be made. Qualification Tests are scheduled to begin the first week in May.

AN/BRA-34 TEST & EVALUATION SUPPORT

B55600

Alexander J. Santos

The static loading tests have been completed on the Antenna in the fore and aft plane only. The Antenna was removed from the facility to insert into a modified bearing cartridge prior to being subjected to Underwater Shock Test. The remaining tests will be completed when the Antenna is returned to the Laboratory.

IACS/QRP SUPPORT

A61633

John H. Mascarenhas

During this reporting period, the Test and Evaluation effort included FAT witnessing on the following equipment: General Electric's Communication Beamformer Ser #4-6; Sanders' WQT-2, Ser #1005, 2005-2008; Spectral Dynamics' WQR-2 Ser #4; Honeywell's HX-90S Transducer Ser #7-10. The test results were within the equipment specification limits.

The only significant problem occurred during testing of General Electric's Unit 103 (System Ser #5-6): the bearing bug assembly had excessive oscillations after warm-up. The cause of the malfunction was investigated and the problem eliminated by inserting a 470-pf capacitor across R1 in the Servo Repeater circuit.

Since Factory Acceptance Tests have been completed on all portions of the IACS system, the T & E participation in the IACS/QRP Program was terminated as of 5 March 1973.

HYDRODYNAMIC SHOCK EXPERIMENTS

A72005

Milford E. Evans

Hydrodynamic Shock Simulator

The shock simulator was used in this quarter for one contractor and one in-house project.

Honeywell, Inc., Seattle, Washington used the simulator to evaluate the design of an experimental element and mounting stave.

Transducer S/N-HX391; the test consisted of six shots. The element was subjected to 650, 1200, (2) 2,000 and (2) 3,000 psi shock pulses. The element appeared to suffer some shock damage after the first 3,000 psi shot. The design of the stave appeared to be satisfactory.

The in-house project was conducted for Code TD123. A spherical hydrophone was shock tested a total of 19 times with pressures ranging from 500 to 3000 psi. This element was free field mounted. The element appeared to be somewhat downgraded after the shock test series although no catastrophic failures were evident.

FLEET FATHOMETER PROGRAM

A72800

Philip G. Danforth

AN/UQN-1H - Additional source data for the AN/UQN-1H Simm Technical Manual has been sent to Dustin Associates. The source data covers operation, installation, and parts list. NUSC generated the operating instructions and made major corrections to the installation data.

AN/UQN-1K - Additional source data for the AN/UQN-1K Simm Technical Manual has been sent to Dustin Associates. The source data covers operation, installation, and parts list. NUSC generated the operating instructions and made major corrections to the installation data with the help of NAVSEC/San Diego. NUSC delivered 9 muting assemblies for the AN/UQN-1K to NAVSEC/San Diego in February and 56 more assemblies in March. This completes NUSC's production of muting assemblies with 65 units delivered; five more than required. The entire design, breadboarding and production including all parts procurements, was completed in 5 months. Code EA311 also modified a muting assembly and installed it on the USS STURGEON's (SSN 637) AN/UQN-1H for testing during the WLR-9 sea tests.

AN/UQN-4 - The final iteration for the new 1A4A3 card was completed, along with the MIL-D-1000 drawing set. A formal fabrication specification for 1A4A3 was also prepared. All the parts for the new printed circuit card have been received except the crystals. All the integrated circuits, approximately 10,000, have been tested on a test set designed and constructed for this purpose. A contract for 280 1A4A3 cards, with an override for 300 additional cards for E.S.O., was let to Meletronics Mfg. Co., Bristol, Pa., on 14 April 1973. All components required for manufacture of these cards are ready for shipment to Meletronics pending first article approval of the cards. The test specification and test simulator for these cards is in progress.

One complete Field Change 4 was installed on the AN/UQN-4 located at Dustin Associates in order to write the technical manual in mid-January. Source data for FC-4 to Dustin Associates has been revised to show the deletion of Field Change 1 to the AN/UQN-4's. Dustin Associates has been sent all source data - parts, schematics, installation data, operation - for the new technical memorandum except overall operation of the AN/UQN-4.

4-AN/UQN-4 - A preliminary field change bulletin for 4-AN/UQN-4 has been completed and evaluated with two installations. One installation of FC-1N using the bulletin was made by NAVSEC/NORDIV. The field change AN/UQN-4 was then deployed to SSN 688 in March. This unit has FC-1 deleted. The other FC-1V installation was made on the YP 669 as part of the at-sea evaluation of the field change. This installation has not yet been revised to show the deletion of FC-1. The field change was successfully sea tested on the YP 669 during the 1st and 2nd of March in Newport Bay. Preliminary results are that FC-1V definitely improves the AN/UQN-4 performance. In particular, the Discriminator is effective in stabilizing the digital display, the Electronic Keying is effective, and the AN/UQN-4 has been demonstrated to be accurate and reliable in shallow water operation. The sea test also indicates that the TVG adjustment in the receiver card is critical for successful AN/UQN-4 operation where transducers may be installed

FLEET FATHOMETER PROGRAM(cont.)

in a less than optimum manner. A report on the sea test has been postponed until the crush of other aspects of this program are over. The assistance of the Navy personnel associated with the YP 669 greatly helped Code EA311 to conduct a good sea test. Production of all the wiring harnesses and front panel switches and all incidental hardware for 240 Field Change 4 Kits was commenced during this time period. Approximately 50% of the hardware items for Field Change 4 were completed at the end of March. A test specification for the 1A4A13 card was written and needs final typing before completion.

AN/UQN-() - Discussions were held with NAVSHIPS PMS-302 which highlighted overall program approach to generate a new fleet fathometer.

TECHNICAL ASSISTANCE FOR SUBMARINE LAUNCHED EXPENDABLE
BATHYTHERMOGRAPH SYSTEM

A16400

Thomas G. Bucko/Philip G. Danforth

During January, Code EA311 and PMS 302-3 reviewed Sippican's program plan for redeveloping the SSXBT probe at Sippican. Code EA311 collected a quantity of data required to define the interface requirements for the SSXBT recorder. A program plan highlighting all technical aspects of the SSXBT system was submitted to NAVSHIPS at the end of the quarter. The program plan will be published as a technical memorandum in the fourth quarter.