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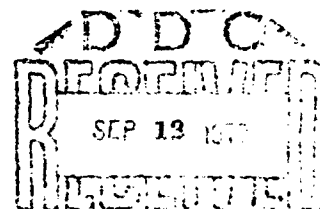
AD-748 000

**PERFORMANCE FACTORS IN
UNDERWATER ENVIRONMENT**

A DDC BIBLIOGRAPHY

DDC-TAS-72-42

AUGUST 1972



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DEFENSE SUPPLY AGENCY**

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Security Classification

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	16						

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**PERFORMANCE FACTORS IN
UNDERWATER ENVIRONMENT**

A DDC BIBLIOGRAPHY

March 1942 - September 1971

DDC-TAS-72-42

AUGUST 1972

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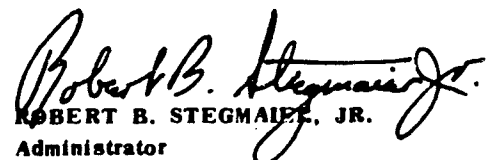
FOREWORD

This bibliography consists of 154 references to reports processed into the Defense Documentation Centers data bank covering the period from January 1953 through January 1972, on *Performance Factors in an Underwater Environment*. It includes the physiological effects on divers and the human factors aspects of engineering activities.

Corporate Author-Monitoring Agency and Subject Indexes are included.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL


ROBERT B. STEGMAIER, JR.
Administrator
Defense Documentation Center

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-135 631

PSYCHOLOGICAL CORP NEW YORK

ARRANGEMENT OF EQUIPMENT IN A SUBMARINE COMBAT
INFORMATION CENTER

(U)

MAJ 48 IV
REPT. NO. 151 1 12
CONTRACT: NAURI-151

CHANNELL, RALPH C.; TOLCOTT, MARTIN A. I

UNCLASSIFIED REPORT

DESCRIPTORS: •COMBAT INFORMATION CENTERS, HUMAN
ENGINEERING, SHIPBORNE, SUBMARINES

(H)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-231 390

NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA

UNDERWATER ESCAPE PROGRAM. TESTS OF F4U-1 PILOTS'
SURVIVAL EQUIPMENT FOR POSSIBLE USE IN NADEVEN
AUTOMATIC DITCH SYSTEM

(U)

UCT 58 IV LORCH, DANIEL L.:
REPT. NO. ED 5826
PROJ: ADL AE 6307

UNCLASSIFIED REPORT

DESCRIPTORS: •BREATHING APPARATUS, •LIFE PRESERVERS,
•OXYGEN EQUIPMENT, •PILOTS, •SURVIVAL, •UNDERWATER
EQUIPMENT, BAILOUT, JET FIGHTERS

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-255 684

GENERAL DYNAMICS CORP GAITHERSBURG ELECTRIC BOAT DIV

TRANSFER OF TRAINING AS A FUNCTION OF TASK DIFFICULTY
IN A COMPLEX CONTROL SITUATION (U)

JAN 61 IV GOLUSTEIN, DONALD A.; INETON, JOHN H. I
REPT. NO. U411 61 J07
CONTRACT: NONR3075J0

UNCLASSIFIED REPORT

DESCRIPTORS: *CONTROL SYSTEMS, *TRAINING, *TRANSFER OF
TRAINING, CONTROL, DEPTH FINDING, EFFECTIVENESS,
PERCEPTION, STATISTICAL ANALYSIS, SUBMARINE HULLS,
SUBMARINE PERSONNEL, SUBMARINES, TESTS, TRACKING,
TRAINING DEVICES, VELOCITY (U)

TWO SUBMARINES, DIFFERING WITH RESPECT TO THEIR
DYNAMIC RESPONSE CHARACTERISTICS AS A FUNCTION OF
DIFFERENCES IN HULL SIZE, WERE SIMULATED AT EACH OF
TWO SPEEDS (SLOW AND FAST). FOUR GROUPS OF 20
SUBJECTS WERE TRAINED ON A DEPTH-KEEPING TASK, ONE
GROUP ON EACH OF 4 HULL-SPEED COMBINATIONS.
FOLLOWING TRAINING, 3 SUBGROUPS OF 5 SUBJECTS FROM
EACH GROUP WERE TESTED ON THE OTHER 3 HULL-SPEED
CONDITIONS, WITH THE REMAINING 5 SUBJECTS TESTED ON
THE SAME SYSTEM. THIS WAS DONE TO DETERMINE THE
DEGREE TO WHICH TRAINING ON ANY 1 OF THE 4 SYSTEMS
TRANSFERS TO THE OTHER 3 SYSTEMS. IT WAS FOUND
THAT, ON THE BASIS OF MEAN TIME ON TARGET SCORES PER
FIVE-TRIAL BLOCK, THE MORE DIFFICULT SYSTEMS TO
CONTROL WERE THOSE WITH THE LONGER CONTROL LAGS.
THESE WERE THE SMALL HULL AT SLOW SPEED AND LARGE
HULL AT SLOW SYSTEMS. IT WAS ALSO FOUND THAT
TRAINING ON THE MOST DIFFICULT CONTROL SYSTEM, THE
LARGE HULL AT SLOW SPEED SYSTEM, PRODUCED GENERALLY
BETTER TRANSFER EFFECTS THAN DID TRAINING ON ANY
OTHER SYSTEM. (AUTHOR) (U)

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ODL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-257 361

GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

PROJECT SUBIC. SHIP CONTROL A11. AN EMPIRICAL
EVALUATION OF QUICKENING IN A CONTACT ANALOG
DISPLAY

(U)

UCT 60 IV PLATH, DEAN W.; BLAIR, WESLEY C.;
REPT. NO. SPD 60 131
CONTRACT: NONR251200

UNCLASSIFIED REPORT

DESCRIPTORS: *SUBMARINE SIMULATORS, *SUBMARINES, ANALOG
COMPUTERS, ANALOG SYSTEMS, AUTOMATIC, CONTROL SYSTEMS,
DISPLAY SYSTEMS, SIMULATION, SUBMARINE PERSONNEL,
TRAINING, TRAINING DEVICES
IDENTIFIERS: SUBIC

(U)

(U)

THE OBJECTIVE OF THIS STUDY WAS TO DETERMINE THE
EFFECT ON OPERATION PERFORMANCE OF THE ADDITION OF
QUICKENED INFORMATION TO A CONTACT ANALOG
DISPLAY. TWO INDEPENDENT GROUPS OF FIVE
INEXPERIENCED MALE SUBJECTS WERE REQUIRED TO SEEK AND
KEEP COURSE AND DEPTH SIMULTANEOUSLY IN THE
ELECTRIC BOAT DIVISION SUBMARINE SIMULATOR
PROGRAMMED WITH SKIPJACK 20-KNOT EQUATIONS. EACH
GROUP WAS TESTED ON ONE OF TWO SHIP CONTROL DISPLAYS:
(1) A QUICKENED COURSE AND DEPTH DISPLAY, AND
(2) A QUICKENED COURSE AND DEPTH DISPLAY
SUPERIMPOSED ON A TWO-SURFACE CONTACT ANALOG
DISPLAY WHICH INCLUDED A ROADWAY DIRECTOR AND AN
ARTIFICIAL HORIZON. TIME ON ORDERED DEPTH, ON
COURSE, AND ON BOTH WERE RECORDED SIMULTANEOUSLY.
SCORES OBTAINED BY EACH GROUP WERE COMPARED WITH
EACH OTHER AND WITH SCORES OBTAINED IN AN EARLIER
EXPERIMENT WITH AN UNQUICKENED CONTACT
ANALOG ROADWAY DISPLAY. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-272 913

GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

SUBIC: SHIP CONTROL XIV ADVANCED FBM SUBMARINE SHIP
CONTROL CONSOLE (U)

AUG 61 IV BLAIR, W.C.; HENRY, W.O.;

REPT. NO. 0411 61 104

CONTRACT: NONR251200

UNCLASSIFIED REPORT

DESCRIPTORS: *COMBAT INFORMATION CENTERS, *CONTROL
SYSTEMS, *DISPLAY SYSTEMS, *SUBMARINES, CONTROL, CONTROL
PANELS, COSTS, DATA PROCESSING SYSTEMS, DIGITAL SYSTEMS,
GUIDED MISSILES, HUMAN ENGINEERING, REDUCTION,
SHIPBORNE, SUBMARINE PERSONNEL, UNDERWATER-TO-SURFACE (U)
IDENTIFIERS: SUBIC (U)

AN INTEGRATED SHIP CONTROL CONSOLE IS DESCRIBED
WHICH IS DESIGNED SO ONE MAN, UNDER NORMAL
WATCHSTANDING CONDITIONS, CAN PERFORM EFFECTIVELY ALL
NORMAL SHIP CONTROL OPERATIONS: STEERING AND DIVING,
HOVERING, SUBMERGING AND SURFACING, TRIM AND BALLAST
CONTROL, MISSILE COMPENSATION, AND SLED ORDERING
CONTROL; AND SO, IN EMERGENCY SITUATIONS, AN
ADDITIONAL MAN CAN PERFORM AT AN EMERGENCY HELMSMAN'S
STATION. THREE MEN NOW PERFORM SHIP CONTROL
OPERATIONS IN NORMAL CONDITIONS, AND A FOURTH MAN IS
REQUIRED DURING AN EMERGENCY SITUATION. THIS
INTEGRATED SHIP CONTROL CONSOLE IS DESIGNED FOR FBM
SUBMARINES AND IS ALSO GENERALLY COMPATIBLE WITH THE
PRESENT REQUIREMENTS FOR ASW AND ATTACK SUBMARINES.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-284 224

NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

DEEP-OCEAN STUDIES, SERVICE VEHICLE

(U)

DESCRIPTIVE NOTE: REPT. ON TYPE C.

AUG 62 41P TAYLOR, DOUGLAS:

REPT. NO. NCEL-TN-204

PROJ: Y-FUIS-01-JJIF

UNCLASSIFIED REPORT

DESCRIPTORS: *UNDERWATER EQUIPMENT, *VEHICLES,
CONSTRUCTION, DIVING, SALVAGE, UNDERWATER

(U)

A SURVEY WAS CONDUCTED TO DETERMINE PRESENT
CAPABILITY FOR DEEP-OCEAN WORK. A SUMMARY OF
PREVIOUS UNDERWATER EXPERIENCE AND A BRIEF
DESCRIPTION OF 18 DIFFERENT UNDERWATER-VEHICLE
CONCEPTS AND PROTOTYPES ARE GIVEN. CRITERIA ARE
PROVIDED AS A BASIS FOR THE DESIGN OF TWO SUITABLE
VEHICLES FOR THE CONSTRUCTION AND MAINTENANCE OF
DEEP-OCEAN STRUCTURES. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZHK23

AD-286 Y62

DUNLAP AND ASSOCIATES INC DARIEN CONN

A PREDICTOR INSTRUMENT FOR MANUAL CONTROL (U)

DEC 62 IV KELLEY, CHARLES R.;

UNCLASSIFIED REPORT

DESCRIPTORS: •CONTROL, •DISPLAY SYSTEMS, •SUBMARINES,
AUTOMATIC, DEPTH FINDING, HUMAN ENGINEERING (U)

A PREDICTOR INSTRUMENT FOR MANUAL CONTROL.

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-400 36Y

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

A STUDY OF SWIMMER MOUTHPIECES

(U)

FEB 63 IV VAIL, JOHN R.; LINALEVER, PAUL G. JR.;
TOWLE, HERBERT J. JR.;
REPT. NO. HRS 61

UNCLASSIFIED REPORT

DESCRIPTORS: •BREATHING APPARATUS, ACCEPTABILITY,
ANATOMY, ANTHROPOMETRY, DESIGN, DIVING, HUMAN
ENGINEERING, MANEUVERABILITY, MOUTH, SHOCK (PATHOLOGY),
SWIMMING (U)

DESIGN SURVEY FOR A SCUBA MOUTHPIECE WITH THE CONCEPT OF
ORAL PHYSIOLOGY AS WELL AS ANATOMICAL STRUCTURES OF THE
ORAL CAVITY.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-403 02Y

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

IMPROVED OPERATOR DETECTION PERFORMANCE
CONSEQUENT TO THE USE OF OPTIMUM BIAS AND GAIN. (U)

FEB 63 JIP AKER, C.H.;
REPT. NO. TR406 20
CONTRACT: NONR264900
PROJ: NR153 199

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN FACTOR PROBLEMS
IN ANTI-SUBMARINE WARFARE.

DESCRIPTORS: SONAR PERSONNEL, SONAR TARGETS,
CATHODE RAY TUBES, VISION, TARGET DISCRIMINA
TION, CYBERNETICS, SONAR EQUIPMENT, TARGET REC
OGNITION, VIEWING SCREENS, DISPLAY SYSTEMS,
BRIGHTNESS, HUMAN ENGINEERING, RELIABILITY,
PERFORMANCE TESTS. (U)

FIVE EXPERIMENTS WERE UNDERTAKEN USING THE VISUAL
DISPLAY OF A SONAR STACK. THE FIRST THREE WERE
PSYCHOPHYSICAL IN NATURE, UNDERTAKEN TO DETERMINE THE
EFFECTS OF CRT BIAS (DISPLAY BRIGHTNESS) AND
GAIN UPON OPERATORS' TARGET DETECTION PERFORMANCE.
AT VARIOUS RANGES, WITH AND WITHOUT REVERBERATIONS.
OPTIMUM VALUES OF BIAS AND GAIN WERE DETERMINED.
THE FOURTH EXPERIMENT WAS UNDERTAKEN TO DETERMINE
VALUES OF CRT BIAS AND GAIN CONSIDERED OPTIMUM BY
EXPERIENCED OPERATORS. IN COMPARISON WITH THE
VALUES DETERMINED IN THE FIRST EXPERIMENT TO BE
OPTIMUM, THE AVERAGE VALUES OF THE EXPERIENCED
OBSERVERS REPRESENTED A PERFORMANCE LOSS OF ABOUT 10
DECIBELS. THE FIFTH EXPERIMENT COMPARED TARGET
DETECTION PERFORMANCE OF 26 OPERATORS IN SEARCHING
FOR TARGETS WHEN (1), THE DISPLAY WAS AT
EXPERIMENTALLY DETERMINED OPTIMUM OF BIAS AND GAIN,
WITH THAT WHEN (2) THE DISPLAY WAS AT VALUES OF
BIAS AND GAIN SET BY THE OPERATORS. WHEN
EXPERIMENTALLY DETERMINED VALUES OF BIAS AND GAIN
WERE EMPLOYED, THERE WAS AN IMPROVEMENT IN THE
PERCENTAGE OF TARGETS DETECTED BY A FACTOR OF 10, AND
ONE QUARTER AS MANY FALSE REPORTS OF TARGETS WERE
MADE. A BRIEF SURVEY CONDUCTED ABOARD SEVEN SHIPS
IN PORT INDICATED THAT THE FINDINGS OF THE FOURTH
EXPERIMENTALLY THE SAME HAD BEEN FORMANCE CONSEQUENT TO
THE USE OF OPTIMUM BIAS AND GAIN. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-406 139

NAVY MINE DEFENSE LAB PANAMA CITY FLA

DEVELOPMENT OF EMERGENCY BREATHING APPARATUS,

(U)

APR 63 21P ODUM, W.T.:
REPT. NO. MDL-197

UNCLASSIFIED REPORT

DESCRIPTORS: •BREATHING APPARATUS, UNDERWATER
EQUIPMENT, HELICOPTERS, DITCHING, SAFETY DE
VICES, NAVAL AIRCRAFT, AIR SEA RESCUES, AVIA
TION SAFETY, DESIGN.

(U)

AN EMERGENCY BREATHING APPARATUS DEVELOPED AT THE
U. S. NAVY MINE DEFENSE LABORATORY IS DE
SCRIBED. THE APPARATUS WILL PERMIT CREW MEMBERS TO
SUBMERGE WITH THE AIRCRAFT AND MAKE AN UNHURRIED,
SAFE, UNDERWATER EXIT. A 15-MINUTE BREATHING
SUPPLY IS PROVIDED IN A LIGHTWEIGHT, COMPACT, SIMPLE
AND EASILY MAINTAINABLE PACKAGE, WHICH CAN BE USED BY
ALMOST ANYONE AFTER A SHORT PERIOD OF INSTRUCTION.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-414 395

NAVY MINE DEFENSE LAB PANAMA CITY FLA

DIVER'S INSTRUMENTED OBSERVATION BOARD: PAPER 1,
SCIENTIFIC DIVING SERIES,

(U)

JUL 63 11P DOWLING, G. B. :

REPT. NO. MDL-210

PROJ: SF011-01-0.

TASK: 2612

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DIVING, INSTRUMENTATION), (*SCIENTIFIC
RESEARCH, UNDERWATER EQUIPMENT), RECORDING SYSTEMS,

DEPTH INDICATORS, COMPASSES

(U)

IDENTIFIERS: 1963, DIVER'S OBSERVATION BOARD

(U)

IN THE COURSE OF WORK INVOLVING DIVING BY
SCIENTISTS, A NUMBER OF SPECIALIZED INSTRUMENTS AND
TECHNIQUES FOR USE BY SCIENTIFIC DIVERS WERE
DEVELOPED, ONE OF THESE BEING THE "DIVER'S
OBSERVATION BOARD," A COMBINATION OF BASIC
DIVING INSTRUMENTS WHICH ARE GENERALLY USED
SEPARATELY. THE DIVER'S OBSERVATION BOARD HAS
RESULTED IN GREATLY INCREASED EFFICIENCY OF
OBSERVATION AND RECORDING OF SEVERAL TYPES OF
UNDERWATER DATA OF VALUE TO OCEANOGRAPHY. IT
CONSISTS OF A 6-BY 8-IN. WRITING BOARD IN AND ON
WHICH ARE MOUNTED A COMPASS, DEPTH GAUGE,
INCLINOMETER, PULL-OUT PROTRACTOR, BUBBLE LEVELS,
PENCILS; IT HAS RULED EDGES, MEANS FOR ATTACHING
OTHER MEASUREMENT TOOLS, AND MEANS FOR ATTACHMENT TO
THE DIVER'S BELT. A FUNCTIONAL DESCRIPTION IS
GIVEN AND SOME APPLICATIONS AND THEIR RESULTS ARE
DISCUSSED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHX23

AD-414 395

NAVY MINE DEFENSE LAB PANAMA CITY FLA

DIVER'S INSTRUMENTED OBSERVATION BOARD: PAPER 1,
SCIENTIFIC DIVING SERIES. (U)

JUL 63 IIP DOWLING, G. B. ;
REPT. NO. MDL-210
PROJ: SFC11-01-0,
TASK: 2612

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DIVING, INSTRUMENTATION), (*SCIENTIFIC
RESEARCH, UNDERWATER EQUIPMENT), RECORDING SYSTEMS,
DEPTH INDICATORS, COMPASSES (U)
IDENTIFIERS: 1963, DIVER'S OBSERVATION BOARD (U)

IN THE COURSE OF WORK INVOLVING DIVING BY
SCIENTISTS, A NUMBER OF SPECIALIZED INSTRUMENTS AND
TECHNIQUES FOR USE BY SCIENTIFIC DIVERS WERE
DEVELOPED, ONE OF THESE BEING THE "DIVER'S
OBSERVATION BOARD." A COMBINATION OF BASIC
DIVING INSTRUMENTS WHICH ARE GENERALLY USED
SEPARATELY, THE DIVER'S OBSERVATION BOARD HAS
RESULTED IN GREATLY INCREASED EFFICIENCY OF
OBSERVATION AND RECORDING OF SEVERAL TYPES OF
UNDERWATER DATA OF VALUE TO OCEANOGRAPHY. IT
CONSISTS OF A 6-BY 8-IN. WRITING BOARD IN AND ON
WHICH ARE MOUNTED A COMPASS, DEPTH GAUGE,
INCLINOMETER, PULL-OUT PROTRACTOR, BUBBLE LEVELS,
PENCILS; IT HAS RULED EDGES, MEANS FOR ATTACHING
OTHER MEASUREMENT TOOLS, AND MEANS FOR ATTACHMENT TO
THE DIVER'S BELT. A FUNCTIONAL DESCRIPTION IS
GIVEN AND SOME APPLICATIONS AND THEIR RESULTS ARE
DISCUSSED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-444 530

NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

PREDICTION OF ADJUSTMENT TO PROLONGED SUBMERGENCE
ABOARD A FLEET BALLISTIC MISSILE SUBMARINE. IV.
PSYCHOLOGICAL INDICES, (U)

NOV 63 31P WEYBREW, BENJAMIN B. ;
REPT. NO. 416 ,VOL. 22 18
MONITOR: NAVMED MKU05 14 2200 1 06

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SUBMARINE PERSONNEL, BEHAVIOR),
(BEHAVIOR, SUBMARINE PERSONNEL), ADJUSTMENT
(PSYCHOLOGY), BALLISTIC MISSILE SUBMARINES, CORRELATION
TECHNIQUES, STABILITY, STRESS (PSYCHOLOGY), ADAPTATION
(PHYSIOLOGY), EMOTIONS, VENTILATION, RESPIRATION,
PSYCHOPHYSIOLOGY, ATTITUDES, NAVY RESEARCH, NERVOUS
SYSTEM, MOTIVATION (U)
IDENTIFIERS: SUBMERGENCE (U)

FOURTEEN PSYCHOPHYSIOLOGICAL INDICES OF RESPONSE TO
HYPERVENTILATION AND BREATHHOLDING AND TO
DISCRIMINATION-CONFLICT STRESS WERE COMBINED WITH
MEASURES OF NEUROTICISM, MOTIVATION, AND APTITUDE TO
FORM A CORRELATION MATRIX INCLUDING ADJUSTMENT
RATINGS OBTAINED FROM 200 MEN DURING TWO SUCCESSIVE
CRUISES ABOARD A NUCLEAR SUBMARINE. PATTERNS OF
PSYCHOPHYSIOLOGICAL INDICATORS WITH ADJUSTMENT
CRITERIA WERE IDENTIFIED BY FACTOR VARIABLES RESULTED
IN MULTIPLE R'S RANGING FROM .40 TO .62. FOR
THE PURPOSE OF COMMUNICATION, THESE FACTORS WERE
LABELED LIMITED ADJUSTMENT POTENTIAL, OPTIMAL
ADJUSTMENT POTENTIAL, AUTONOMIC RESILIENCY,
AUTONOMIC FEEDBACK, AND STRESS RESPONSIVITY.
THE STRUCTURE OF THE FACTORS SUGGESTED
SOMATOPSYCHOLOGICAL DIMENSIONS OF USE IN PERSONALITY
ASSESSMENT ESPECIALLY WHEN SELECTION OF MEN FOR
HAZARDOUS DUTY IS INVOLVED. (AUTHOR) (U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-464 326

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

HUMAN FACTOR PROBLEMS IN ANTI-SUBMARINE WARFARE.
SONAR OPERATOR DETECTION PERFORMANCE AT SEA.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

APR 64 14P BAKER, C. M. ; PARKER, E. L. ;

HITTGER, J. C. ;

REPT. NO. TR-206-26

CONTRACT: N0NR264900

PROJ: NR153 199

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SONAR PERSONNEL,
PERFORMANCE (HUMAN)), (ANTISUBMARINE WARFARE,
SONAR PERSONNEL), SONAR EQUIPMENT, OPERATION,
SONAR TARGETS, DETECTION, GAIN, VOLTAGE,
EFFECTIVENESS, UNDERWATER OBJECT LOCATORS, NAVAL
TRAINING, IDENTIFICATION SYSTEMS, SONAR
IDENTIFIERS: AN/SQS-23, DLG 22

(U)

(U)

AN EARLIER EXPERIMENT USING TRAINING EQUIPMENT
ASHORE INDICATED THAT A SIGNIFICANT IMPROVEMENT COULD
BE EXPECTED IN SONAR TARGET DETECTION PERFORMANCE BY
EMPLOYING BIAS AND GAIN VOLTAGES WHICH DIFFERED FROM
THOSE TYPICALLY EMPLOYED. THIS REPORT DESCRIBES A
SIMILAR, THOUGH BRIEFER, EXPERIMENT UNDERTAKEN AT SEA
WITH AN AN/SQS-23A SONAR. IN A PRELIMINARY
EXPERIMENT, USING PROJECT PERSONNEL AS OBSERVERS,
DETECTION PERFORMANCE WAS DETERMINED FOR SEVERAL
VALUES OF BIAS AND GAIN. IN THE MAIN EXPERIMENT
DETECTION PERFORMANCE OF THE SHIP'S EIGHT SONAR
OPERATORS WAS COMPARED WHEN (1) EMPLOYING THEIR
FAVORED VALUES OF BIAS AND GAIN, AND WHEN (2)
EMPLOYING VALUES SELECTED AS A RESULT OF THE
PRELIMINARY EXPERIMENT. IT WAS FOUND THAT BY
INCREASING THE GAIN (ACTUALLY DECREASING THE GAIN
VOLTAGE 3.3 VOLTS) ABOVE THAT TYPICALLY SELECTED BY
OPERATORS OF AN AN/SQS-23A SONAR OPERATING AT
SEA, TARGET DETECTION PERFORMANCE WITH RESPECT TO
TARGETS GENERATED BY THE SONAR TEST SET WAS IMPROVED
BY APPROXIMATELY 3 DECIBELS. THIS RESULT PROVIDES
OBJECTIVE EVIDENCE FOR THE VALIDITY OF THE FREQUENTLY
MADE OBSERVATION THAT MANY SONAR OPERATORS SEARCH AT
A GAIN LEVEL SUBSTANTIALLY BELOW THE OPTIMUM.
(AUTHOR)

(U)

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-477 357 5/9
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

THE NSMC SONAR OPERATOR ALERTNESS RESEARCH APPARATUS:
DESCRIPTION AND INSTRUCTIONS FOR USE. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,
SEP 65 12P HARRIS, J. DONALD ;
REPT. NO. SR-65-6
MONITOR: NAVMED MF022-03-03-9020-03

UNCLASSIFIED REPORT

DESCRIPTORS: (SONAR PERSONNEL,
PERFORMANCE (HUMAN)), ATTENTION, RESPONSE, TEST
EQUIPMENT, PORTABLE, INSTRUCTION MANUALS, DESIGN,
AUDITORY SIGNALS, AUTOMATIC, BALLISTIC MISSILE
SUBMARINES, REACTION (PSYCHOLOGY), SHIPBORNE,
AUDITORY PERCEPTION, LABORATORY EQUIPMENT (U)
IDENTIFIERS: POLARIS (U)

THE DESIGN WAS INVESTIGATED OF A SIMPLE PORTABLE
SYSTEM WITH WHICH TO PERFORM RESEARCH ON SONAR
OPERATOR VIGILANCE, IN THE LABORATORY AND ESPECIALLY
WHILE UNDER-WAY IN SUBMARINES. AN INEXPENSIVE
AUTOMATIC SYSTEM WAS DERIVED TO PRESENT SIGNALS AND
BACKGROUND NOISE TO A LISTENER, AND TO RECORD HIS
RESPONSES (TOGETHER WITH STRENGTHS OF SIGNALS AND
NOISE) SO THAT OVER EXTENDED VIGILANCE TESTING
SESSIONS THE DETECTION PERFORMANCE OF THE OPERATOR
MAY BE SPECIFIED AT SELECTED INTERVALS. THE SYSTEM
IS USEFUL AS A RESEARCH TOOL IN SPECIFYING
DIFFERENCES AMONG LISTENERS IN DETECTION ABILITY, IN
RESISTANCE TO MONOTONY, IN EFFECT OF SIGNAL DENSITY,
TIME ON WATCH, DRUGS, GROUP INTERACTIONS, ETC.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-601 044
NAVAL MEDICAL RESEARCH INST BETHESDA MD

THERMAL PROTECTION DURING IMMERSION IN COLD
WATER.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT. NO. 1
MAR 64 2JP BECKMAN, E. L. ;
PROJ: MR005 13 4001 U6

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SECOND SYMPOSIUM
ON UNDERWATER PHYSIOLOGY, WASHINGTON, D. C., 25-26
FEB 63

DESCRIPTORS: (UNDERWATER CLOTHING, BODY TEMPERATURE),
(BODY TEMPERATURE, UNDERWATER CLOTHING), EXPOSURE,
UNDERWATER, PROTECTIVE CLOTHING, RESISTANCE
(ELECTRICAL), BATTERIES AND COMPONENTS, BLANKETS,
SWIMMING, THERMAL CONDUCTIVITY, THERMAL INSULATION,
HEAT, MOULEN TEXTILES, THICKNESS, SCUBA DIVERS, HEAT
TRANSFER, RUBBER, FOAM RUBBER (U)

THE PHYSICAL PRINCIPLES WHICH PERTAIN TO HEAT LOSS
FROM THE HUMAN BODY WHEN IMMERSED IN WATER AT LOWER
TEMPERATURES THAN ITS OWN, TOGETHER WITH THE
PHYSIOLOGICAL MECHANISMS WHICH ARE ACTIVATED IN
MAINTAINING THERMAL BALANCE ARE REVIEWED AND RELATED
TO THE PROBLEMS OF THERMAL BALANCE OF UNDERWATER
SWIMMERS. DATA ON THE AMOUNT OF HEAT LOST UNDER
VARIOUS CONDITIONS OF WATER TEMPERATURE, BODY
INSULATION, AND RATES OF HEAT PRODUCTION ARE
PRESENTED. THE LIMITED EFFECTIVENESS OF INCREASING
INTERNAL AND EXTERNAL BODY INSULATION IS ESTABLISHED
BY THIS DATA. THE PROPOSAL OF A METHOD TO
COUNTERACT THE BODY HEAT LOSS OF UNDERWATER SWIMMERS
BY THE USE OF ELECTRICAL RESISTANCE CLOTHING IS
PRESENTED AS BEING FEASIBLE WITHIN THE PRESENT STATE
OF THE ART OF BATTERY AND BLANKET MANUFACTURE.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-609 490

SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE
PHYSICAL LAB

MANIPULATORS AND SPECIAL DEVICES,

(U)

JUL 64 17P ANDERSON, VICTOR C. O'NEAL, H.

A. ;

REPT. NO. MPL-U-50/64 ,SIO-REF-64-16

CONTRACT: NONR221605

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJ. SEABED.

DESCRIPTORS: (OCEANOGRAPHIC EQUIPMENT, UNDERWATER
EQUIPMENT), (POSITIONING DEVICES (MACHINERY),
UNDERWATER EQUIPMENT), SONAR, UNDERWATER LIGHTS,
UNDERWATER OBJECT LOCATORS, SMALL TOOLS, UNDERWATER
CUTTING, HYDRAULIC SYSTEMS, TELEVISION COMMUNICATION
SYSTEMS, UNDERWATER, TEST FACILITIES, HYDRAULIC PRESSURE
PUMPS, SEA WATER (U)
IDENTIFIERS: SEABED PROJECT (U)

THE IMPORTANT FACTORS INVOLVED IN THE PERFORMANCE
OF WORK IN THE DEEP OCEAN ARE DISCUSSED, AND THE
REQUIREMENTS FOR SPECIAL DEVICES WHICH MAY BE USED
TO ENHANCE THE EFFICIENCY OF THIS WORK ARE OUTLINED.
THE BASIC REQUIREMENTS OF OBSERVATIONS AND
MANIPULATION POINT TO SPECIFIC NEEDS FOR
TECHNOLOGICAL DEVELOPMENTS BUT DO NOT CALL FOR ANY
EXTENSIVE PROGRAM OF FUNDAMENTAL RESEARCH.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-610 48Y

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

RESEARCH ON THE DEVELOPMENT OF SHIPBOARD PERFORMANCE
MEASURES AND PERFORMANCE JUDGMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.

JAN 65 26P

CONTRACT: NONR124100

PROJ: NR153 165

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (1) SUBMARINE PERSONNEL, PERFORMANCE TESTS),
(2) PERFORMANCE TESTS, SUBMARINE PERSONNEL), PERFORMANCE
(HUMAN), PSYCHOMETRICS, APTITUDE TESTS, ATTITUDES,
OFFICER PERSONNEL, NAVAL PERSONNEL, STRESS (PSYCHOLOG(U)
IDENTIFIERS: JUDGMENT, PREDICTION (U)

SUMMARIES ARE PRESENTED OF RESEARCH CONDUCTED ON
THE MEASUREMENT OF THE PERFORMANCE OF ENLISTED
PERSONNEL SERVING ABOARD SUBMARINES. TOPICS
INCLUDE: (1) THE USE OF PRACTICAL PERFORMANCE
TESTS; (2) COMPARISONS OF RATED AND TESTED
ABILITIES TO DO CERTAIN JOB TASKS; (3)
INTERRELATIONSHIPS BETWEEN APTITUDE TEST SCORES,
PERFORMANCE IN SUBMARINE SCHOOL, AND SUBSEQUENT
PERFORMANCE IN SUBMARINES; (4) PERFORMANCE UNDER
STRESS; (5) FACTOR ANALYTIC STUDIES OF APTITUDES,
INTERESTS, AND PRACTICAL PERFORMANCE SKILLS FOR
NAVY MACHINERY REPAIRMAN STUDENTS; (6)
PREDICTABILITY OF RATINGS; (7) COMPARISON OF
SUPERVISORY RATINGS AND PRACTICAL PERFORMANCE TESTS;
(8) FACTORS INFLUENCING JUDGMENT OF HUMAN
PERFORMANCE; (9) RATER'S SKILLS AND ATTITUDES;
AND (10) INFLUENCE OF UNUSUAL PERFORMANCES AND
TIME-ORDER ON PERFORMANCE JUDGMENT. AN INDEX OF
REPORTS PREPARED UNDER THIS CONTRACT IS ALSO GIVEN. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-613 37U

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

ADAPTATION OF HELIUM-OXYGEN TO MIXED-GAS SCUBA. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,

MAR 65 70P WORKMAN, ROBERT D. ;

REPT. NO. NEUU-RM-1-65

PROJ: 5F011-06-01

TASK: 3361

UNCLASSIFIED REPORT

DESCRIPTORS: (*BREATHING APPARATUS, DIVING); (*DIVING; BREATHING APPARATUS); (*SCUBA DIVERS, BREATHING APPARATUS); HELIUM, OXYGEN, MIXTURES, DECOMPRESSION SICKNESS, UNDERWATER EQUIPMENT, HUMAN ENGINEERING, SWIMMING (U)

A DECOMPRESSION PROCEDURE FOR USE OF HELIUM-OXYGEN MIXTURES IN MIXED GAS SCUBA TO PERMIT REPETITIVE DIVES TO A DEPTH OF 200 FEET HAS BEEN DEVELOPED EMPLOYING MODIFIED HALDANE PRINCIPLES. THE REPETITIVE DIVING PROCEDURE PROVIDES A SYSTEM BY WHICH A DIVER CAN DETERMINE THE NECESSARY INCREASE IN DECOMPRESSION TIME ON SUCCESSIVE DIVES, BASED ON THE AMOUNT OF EXCESS INERT GAS TENSION IN BODY TISSUES AFTER COMPLETION OF PREVIOUS DIVES. THE AMOUNT OF DECOMPRESSION REQUIRED IS DECREASED BY THE TIME INTERVAL AT THE SURFACE BETWEEN DIVES. THE INFORMATION REQUIRED FOR USE OF THIS SYSTEM IS OBTAINED FROM FOUR TABLES: (1) DECOMPRESSION TABLE (2) NO DECOMPRESSION DIVE TABLE (3) SURFACE INTERVAL CREDIT TABLE AND (4) REPETITIVE DIVE TIME TABLE. A METHOD FOR USE OF OXYGEN DECOMPRESSION AT 30 AND 20 FOOT WATER STOPS IS ALSO PROVIDED. THE VALIDITY OF THIS PROCEDURE IS BASED ON TESTS OF 466 DIVES IN WHICH 28 THREE-DIVE SERIES AND 68 OXYGEN DECOMPRESSION DIVES WERE MADE. THE PROCEDURE AS REPORTED IS CONSIDERED SATISFACTORY AND IS RECOMMENDED FOR FURTHER TESTING UNDER OPERATIONAL CONDITIONS IN THE FIELD BEFORE SERVICE-WIDE USE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-614 713

NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

AN INVESTIGATION OF THE RED ILLUMINATION OF THE
SUBMARINE CONNING TOWER. (U)

DESCRIPTIVE NOTE: INTERVAL REPT. NO. 1,
MAR 46 SIP VERPLANCK, W. S. ;
REPT. NO. NMNL-102
PROJ: NAVMED-X-519

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINES, ILLUMINATION),
(ILLUMINATION, ADAPTATION (PHYSIOLOGY)), VISION,
COLORS, PERFORMANCE TESTS, SUBMARINE PERISCOPES,
TARGETS, POSITION, FINDING, SKY BRIGHTNESS, STIMULATION,
THRESHOLDS (PHYSIOLOGY), HUMAN ENGINEERING, TABLES (U)
IDENTIFIERS: CONNING TOWERS (U)

A SERIES OF EXPERIMENTS ON CONNING TOWER
ILLUMINATION WAS UNDERTAKEN TO DETERMINE THE EXTENT
TO WHICH LABORATORY FINDINGS ON THE EFFECT OF DIM RED
LIGHT UPON NIGHT VISION MAY BE DUPLICATED IN A
PRACTICAL SITUATION. SUCH EXPERIMENTS WERE
CONSIDERED NECESSARY NOT ONLY BECAUSE AVAILABLE DATA
ON DARK ADAPTATION INDICATED THAT SOME DECREMENT IN
NIGHT VISION PERFORMANCE MIGHT BE EXPECTED, BUT ALSO
SUCH A DECREMENT, ALTHOUGH SMALL, HAS BEEN FOUND IN
THE ABSOLUTE VISUAL THRESHOLD. THIS DECREMENT,
EXPERIMENTALLY INDUCED BY A UNIFORMLY ILLUMINATED
FIELD, AND MEASURED BY A PRECISE TECHNIQUE, MIGHT BE
EXPECTED TO APPEAR IN A NON-UNIFORMLY ILLUMINATED
SPACE SUCH AS A CONNING TOWER, WHEN THE PERFORMANCE
IN QUESTION IS ONE WHICH IS AFFECTED BY MANY OTHER
FACTORS THAN THE STATE OF THE ADAPTATION OF THE
RETINA. IT IS THE PRESENT PROBLEM TO DETERMINE
WHETHER OR NOT IT DOES. A PERFORMANCE SIMULATING
THE VISUAL TASK OF AN OFFICER AT THE PERISCOPE WAS
THEREFORE MEASURED UNDER THREE CONDITIONS OF CONNING
TOWER ILLUMINATION. THIS PERFORMANCE WAS THE
DETECTION OF THE POSITION OF A TARGET IN THE DIMLY
ILLUMINATED FIELD OF A SIMULATED PERISCOPE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-618 032

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

CARBON DIOXIDE ABSORPTION SYSTEMS FOR SCUBA. 2.
THEORY AND APPLICATIONS OF A NOVEL, NON-CYLINDRICAL
LOW-RESISTANCE, CO₂ ABSORPTION CANISTER FOR
SCUBA. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,

JUN 65 35P GOODMAN, M. W. ; JAMES, T. W. ;

REPT. NO. NEDU-RK-4-65

PROJ: SFU11-U6-05

TASK: 11511

UNCLASSIFIED REPORT

DESCRIPTIONS: (*SCUBA DIVERS, BREATHING APPARATUS),
(*BREATHING APPARATUS, UNDERWATER EQUIPMENT),
(*CARBON DIOXIDE, BREATHING APPARATUS),
(*ABSORPTION, CARBON DIOXIDE), DIVING, PRESSURE,
CONTAINERS, RECTANGULAR BODIES, DESIGN, FLUID
FLOW, LIFE SUPPORT, RESPIRATORS (U)
IDENTIFIERS: FLATCAN (U)

RESULTS OF UNDERWATER SWIMMING EXPERIENCES;
BREATHING-MACHINE EXPERIMENTS, AND
RECOMPRESSION CHAMBER TESTING TO ELEVEN ATMOSPHERES
ABSOLUTE PRESSURE (330 FEET SEA WATER) WITH NEW
SCUBA CARBON DIOXIDE ABSORPTION CANISTERS ARE
REPORTED. GRANULAR BAKALYME WAS EMPLOYED AS THE
CHEMICAL ABSORBING AGENT. CERTAIN COMPARISONS, BOTH
OF DESIGN AND FUNCTIONAL HISTORY, WITH CONVENTIONAL
CYLINDRICAL CANISTER SYSTEMS ARE EMPHASIZED AND
ANALYZED, AND THEORY OF THE LOW RESISTANCE DEVICE IS
DISCUSSED. AS A THREE-DIMENSIONAL GEOMETRIC SOLID,
THE ESSENTIAL CANISTER SHAPE IS THAT OF A FRUSTUM OF
A RECTANGULAR PYRAMID. IN THE TWO-DIMENSIONAL
ASPECT OF GREATEST SURFACE THE CANISTER PERIMETER
PRESENTS AS A TRUNCATED ISOSCELES TRAPEZOID. INLET
AND EXHAUST HOSE FITTINGS ARE SITUATED NEAR THE
EXTREMES OF THE LARGER RECTANGULAR BASE OF THE
CANISTER. THE ACRONYMS FLATCAN AND
FLATCANISTER DENOTE FLAT, LOW RESISTANCE,
CARBON DIOXIDE ABSORPTION, TRAPEZOIDAL
CANISTERS. MEAN DELTA AND RESISTANCE RESULTS FOR
NINE CYLINDRICAL CANISTERS (16 MECHANICAL
RESPIRATOR EXPERIMENTS) ARE ABOUT 908 AND 158
HIGHER, RESPECTIVELY, THAN THE COMPARABLE MEAN DATA
FOR SEVEN FLATCAN PROTOTYPES (15 RESPIRATOR
EXPERIMENTS).

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UNCLASSIFIED

(U)

/ZHK23

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-618 194

OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL ELEVEN-DAY UNDERSEA SATURATION DIVE
AT 193 FEET. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,

JUN 65 66P O'NEAL, H. A. ; BOND, G. ;

LAMPHEAR, R. ; ODUM, T. ;

REPT. NO. UNM-ACH-106

PROJ: NK290 UDU , RH011 05 05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJ. SEALAB.

DESCRIPTIONS: (•LABORATORIES, UNDERWATER),
(•ADAPTATION(PHYSIOLOGY), DIVING), (•DIVING,
ADAPTATION(PHYSIOLOGY)), OCEANOGRAPHIC EQUIPMENT,
UNDERWATER EQUIPMENT, OCEAN BOTTOM, LIFE SUPPORT,
STRESS(PHYSIOLOGY), SWIMMING, DECOMPRESSION,
HEMATOLOGY, PSYCHOLOGY, TOLERANCES(PHYSIOLOGY) (U)
IDENTIFIERS: SEALAB PROJECT (U)

AN UNDERSEA, AMBIENT-PRESSURE, GAS-FILLED, NINE-
FOOT DIAMETER BY 40-FT-LONG LABORATORY WAS PLACED ON
THE OCEAN FLOOR OFF ARGUS ISLAND NEAR BERMUDA.
FOUR MEN OCCUPIED THE LABORATORY. DURING THIS
PERIOD OF SATURATION 'DIVING' ON A HE-O2-N2 GAS
MIXTURE, THE MEN PERFORMED WORK, ATE, AND SLEPT
WITHIN THE DRY LABORATORY AND MADE WORKING SWIMS IN
THE OCEAN SPACES SURROUNDING THE LABORATORY.
PHYSIOLOGICAL OBSERVATIONS AND MEASUREMENTS WERE
MADE OF THE LABORATORY OCCUPANTS. THE SEALAB
SUBJECTS REACHED A STATE OF EQUILIBRIUM (TISSUE
SATURATION) WITH THEIR BREATHING MEDIUM AT DEPTH
DURING THE FIRST 24-HR PERIOD ON THE BOTTOM. AFTER
THIS TIME, ADDITIONAL EXPOSURE DID NOT INCREASE THE
DECOMPRESSION SCHEDULE. DECOMPRESSION TIME FROM A
'SATURATION' DIVE TO 200 FT MAY BE AS LITTLE AS 30
HR, DEPENDING ON CONDITIONS. SEALAB I PROJECT
DEMONSTRATED: 1. THAT MAN CAN PERFORM USEFUL
WORK AT 200 FT AND DEEPER WITH THIS TECHNIQUE OF
INTEGRATING THE HUMAN MORE FULLY WITH HIS UNDERSEA
ENVIRONMENT, RATHER THAN HAVING HIM MAKE BRIEF,
EXPENSIVE FORAYS INTO IT, ALWAYS RETURNING TO SURFACE
PRESSURE FOR HIS NECESSITIES OF LIFE. 2. NO
ADVERSE PHYSIOLOGICAL EFFECTS AS A RESULT OF AQUANAUT
EXPOSURE TO THE EXPERIMENTAL CONDITIONS OF THE
SEALAB I PROJECT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-619 304

NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

PERFORMANCE IN THE PRE-FLIGHT WATER SURVIVAL COURSE
AS A PREDICTION OF SUCCESS IN FLIGHT TRAINING. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,

JUN 65 13P HUTCHINS, CHARLES W. JR.;

POMAROLLI, RICHARD S.;

REPT. NO. SR-65-J

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE:

DESCRIPTORS: (NAVAL TRAINING, PILOTS), (SURVIVAL,
NAVAL TRAINING), FLIGHT, PHYSICAL FITNESS,
SWIMMING, PERFORMANCE (HUMAN), STUDENTS,
STATISTICAL ANALYSIS, CORRELATION TECHNIQUES (U)

THE WATER SURVIVAL COURSE GRADES OF 1300 PRE-
FLIGHT STUDENTS WERE ANALYZED TO DETERMINE THE
UTILITY OF THESE GRADES AS PREDICTORS OF EVENTUAL
COMPLETION OR FAILURE IN THE FLIGHT TRAINING PROGRAM.
THE WHEHRY-DOOLITTLE METHOD OF TEST SELECTION
WAS USED TO EVALUATE TWO PERFORMANCE MEASURES FROM
THE COURSE: MID-COURSE GRADE AND THE SWIM-
HOLD STATUS. RESULTS INDICATE THAT BOTH THESE
MEASURES MAKE SMALL BUT STATISTICALLY SIGNIFICANT
CONTRIBUTIONS TO THE VALIDITY OF THE MULTIPLE
PREDICTOR. THERE IS EVIDENCE THAT THE VALUE OF THE
WATER SURVIVAL COURSE AS A PREDICTOR DERIVES MORE
FROM A STUDENT'S INITIAL ABILITY AS A SWIMMER THAN
FROM HIS PROGRESS IN THE COURSE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-621 627

NAVAL PERSONNEL PROGRAM SUPPORT ACTIVITY WASHINGTON D C
PERSONNEL RESEARCH LAB

A PRELIMINARY STUDY OF MAN IN THE SEA DIVER PERSONNEL
AND TRAINING IMPLICATIONS, (U)

JUL 65 40P PROPST, A. S. ;
REPT. NO. ARM-66-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DIVING, NAVAL PERSONNEL), (*NAVAL
PERSONNEL, SCUBA DIVERS), (*SCUBA DIVERS,
TRAINING), SELECTION, PERSONNEL MANAGEMENT,
MILITARY REQUIREMENTS, HAZARDS, WAGES, BREATHING
APPARATUS, UNDERWATER CLOTHING, UNDERWATER
EQUIPMENT, SONAR EQUIPMENT, NAVIGATION AIDS,
SAFETY DEVICES, UNDERWATER COMMUNICATION SYSTEMS,
OCEANOGRAPHIC EQUIPMENT, TELEVISION COMMUNICATION
SYSTEMS, LIGHTING EQUIPMENT, SALVAGE (U)
IDENTIFIERS: SEALAB PROJECT (U)

THE REPORT PROVIDES THE CHIEF OF NAVAL
OPERATIONS, BUREAU OF NAVAL PERSONNEL,
SPECIAL PROJECTS OFFICE, FLEET COMMANDERS,
AND NAVAL SCHOOLS WITH PRELIMINARY INFORMATION
RELATED TO THE DIVER PERSONNEL AND TRAINING
REQUIREMENTS FOR THE MAN-IN-THE-SEA PROGRAM,
AND WAS PREPARED AT THE REQUEST OF PERS-
41 (PERSONNEL PROGRAM MANAGEMENT
DIVISION). THE RESEARCH MEMORANDUM DISCUSSES
PROJECTED DIVER REQUIREMENTS IN THE NAVY AND
INCLUDES A REVIEW OF EXISTING AND ANTICIPATED SKILLS
AND KNOWLEDGES, DEPTH QUALIFICATIONS, EQUIPMENT
KNOWLEDGE REQUIRED, PERSONNEL SELECTION PRE-
REQUISITES, HAZARDOUS DUTY IMPLICATIONS, NEC AND
DIVING PAY CONSIDERATIONS, TYPES OF UNDERWATER TASKS
PERFORMED, AND NEW TECHNICAL SKILLS REQUIRED.
COMPARISON OF EXISTING, VERSUS PROJECTED DIVER
PERSONNEL AND TRAINING REQUIREMENTS ARE DISCUSSED AND
REVIEWED IN LIGHT OF REQUIREMENTS ENVISIONED FOR AN
ON-GOING MAN-IN-THE-SEA EFFORT WITHIN THE NAVY.
(AUTHOR) (U)

UNCLASSIFIED

/ZHK23

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-622 064

NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA

INSTALLATION AND EVALUATION OF A TRAINER FOR AVIATION
UNDERWATER SURVIVAL. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,
FEB 56 25P HALL, ANTHONY L. ;
REPT. NO. NSAM-SK-56-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SURVIVAL, SEA RESCUE EQUIPMENT),
(*AVIATION ACCIDENTS, SEA RESCUE EQUIPMENT), (*SEA
RESCUE EQUIPMENT, AVIATION ACCIDENTS), (*TRAINING
DEVICES, SEA RESCUE EQUIPMENT), NAVAL AVIATION,
AVIATION PERSONNEL, DITCHING, RESCUE KITS,
UNDERWATER EQUIPMENT, OXYGEN, BREATHING MASKS,
FLIGHT CLOTHING, FEASIBILITY STUDIES (U)

IN 1952 IT WAS FOUND THAT STANDARD NAVAL AVIATION
OXYGEN EQUIPMENT OPERATED SATISFACTORILY UNDER WATER.
THE CHIEF OF NAVAL AIR TRAINING DESIRED
THAT THIS EQUIPMENT BE INSTALLED AND EVALUATED FOR A
POSSIBLE TRAINING PROGRAM IN AVIATION UNDERWATER
SURVIVAL. STANDARD NAVAL AVIATION OXYGEN EQUIPMENT
WAS INSTALLED IN A DILBERT DUNKER AND AS A
PORTABLE INSTALLATION FOR TRAINING PURPOSES. IN
ADDITION, DIVING EQUIPMENT WAS MADE FOR A 'SAFETY
DIVER.' ALL APPARATUS OPERATED SUCCESSFULLY.
INSTALLATION AND EVALUATION IS DETAILED IN THE
REPORT. EQUIPMENT AND PERSONNEL REQUIRED FOR
OPERATION OF THE APPARATUS, AS WELL AS A SAMPLE
LECTURE ARE INCLUDED IN THE REPORT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-622 168

NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

THE DEVELOPMENT OF METHODS FOR THE SELECTION OF SOUND
LISTENING PERSONNEL. (U)

MAR 42 11P SHILLING, C. A. ;
REPT. NO. NMML-1

UNCLASSIFIED REPORT

DESCRIPTIONS: (•SUBMARINE PERSONNEL, SELECTION),
(•UNDERWATER SOUND EQUIPMENT,
OPERATORS(PERSONNEL)), (•OPERATORS(PERSONNEL),
SELECTION), AUDITORY ACUITY, NOISE, ACOUSTIC
EQUIPMENT, PITCH DISCRIMINATION,
PERFORMANCE(HUMAN), AUDIO PERCEPTION, APTITUDE
TESTS, NAVAL TRAINING, NAVAL PERSONNEL (U)
IDENTIFIERS: PERSONNEL SCREENING TESTS (U)

EARLY IN 1939 WORK WAS UNDERTAKEN TO DETERMINE THE
EFFECT UPON AUDITORY ACUITY OF SOME OF THE HAZARDS
ENCOUNTERED IN THE COURSE OF SUBMARINE DUTY. IT
SEEMED LIKELY THAT THERE MIGHT BE A DETRIMENTAL
EFFECT UPON HEARING FOLLOWING EXPOSURE TO CONDITIONS
SUCH AS THE CONTINUOUS ROAR OF DIESEL ENGINES, THE
NOISE OF GUNPIPE, AND THE MECHANICAL TRAUMA OF HIGH
PRESSURE AIR, AS IN DEEP-SEA DIVING AND LUNG
TRAINING. DETAILED REPORTS OF THE RESULTS OF THIS
WORK ARE BEING PUBLISHED IN THE U.S. NAVY MEDICAL
BULLETIN, THE FIRST SECTION HAVING APPEARED IN THE
JANUARY 1942 NUMBER. IN THE COURSE OF THIS STUDY
IT WAS NOTED THAT MANY OF THE MEN ENGAGED AS SOUND
OPERATORS FAILED TO MEASURE UP TO THE AUDITORY
REQUIREMENTS OF THE MANUAL OF THE MEDICAL
DEPARTMENT, CHAPTER 11, ARTICLE 1535 (D-3).
ALTHOUGH THESE SAME MEN APPARENTLY WERE CAPABLE
OPERATORS OF SOUND DETECTION EQUIPMENT. THIS LED
US TO QUESTION THE USE OF THE AUDIOGRAM AS THE SOLE
MEANS OF SELECTING SOUND OPERATORS. AN ATTEMPT WAS
THEREFORE MADE TO DISCOVER TESTS WHICH MIGHT BETTER
SERVE THIS PURPOSE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-624 /53 6/14 13/10
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

AUDITORY FATIGUE UNDERWATER AT 1900 CYCLES PER
SECOND.

(U)

DESCRIPTIVE NOTE: MEMO. REPT.,
JUL 65 SP SMITH, PAUL F. ;
REPT. NO. 65-9
PROJ: MR005-14-1200
MONITOR: NAVMED , MR004-14-1200-05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•FATIGUE(PHYSIOLOGY), UNDERWATER
SOUND), (•UNDERWATER SOUND,
FATIGUE(PHYSIOLOGY)), AUDIOFREQUENCY, UNDERWATER
SOUND SIGNALS, DIVING, UNDERWATER CLOTHING, SONAR
EQUIPMENT, TRANSDUCERS, THRESHOLDS(PHYSIOLOGY)

(U)

THE OBJECTIVE OF THE RESEARCH WAS TO DETERMINE
WHETHER OR NOT DIVERS MAY SAFELY BE EXPOSED TO
INTENSE UNDERWATER SIGNALS AT 1900 CYCLES PER SECOND.
IT WAS FOUND THAT DIVERS WEARING STANDARD WET SUITS
WITH HOODS CAN SAFELY ENTER THE WATER IN THE PRESENCE
OF SIGNALS OF 1900 CYCLES PER SECOND AT SIGNAL LEVEL
AT LEAST UP TO 169 DECIBELS RE .0004 MICROBAR (95
DB RE 1 MICROBAR) AND REMAIN AT LEAST 30 MINUTES,
UNDER CONDITIONS OF PULSE LENGTH AND DUTY CYCLE
SIMILAR TO THOSE USED IN THIS STUDY. THIS
INFORMATION WILL EVENTUALLY BE USEFUL IN ESTABLISHING
SAFE WORKING DISTANCES FOR NAVY DIVERS FROM SONAR
TRANSDUCERS TRANSMITTING AT 1900 CYCLES PER SECOND.
MORE INTENSE LEVELS WOULD BE NECESSARY TO ESTABLISH
A DAMAGE RISK CRITERION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-624 766 6/14 13/10
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

NOISE SURVEY OF ENGINE ROOMS OF U.S.S. TRINGA. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
HAY 65 OF HARRIS, J. DONALD ; NAUMOFF, N.
S. R. ;

REPT. NO. MR-65-0
MONITOR: NAVMED , MK005-14-1200-2-03

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (SUBMARINES, NOISE), (NOISE,
SUBMARINE ENGINES), MILITARY MEDICINE, SUBMARINE
PERSONNEL, TOLERANCES (PHYSIOLOGY),
THRESHOLDS (PHYSIOLOGY)

(U)

NOISE SURVEY OF ENGINE ROOMS OF U.S.S. TRINGA.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-630 516 5/9
DUNLAP AND ASSOCIATES INC DANIEL CONN

STUDIES OF DIVERS' PERFORMANCE DURING THE SEALAB II
PROJECT. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 66,
MAR 66 S&P BOWEN, HUGH M.; ANDERSEN,
BIRGER; PROMISEL, DAVID;
REPT. NO. SSU-66-296(571);
CONTRACT: NONR-4930(UO)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DIVING, PERFORMANCE TESTS),
UNDERWATER, PERSONNEL, PERFORMANCE (HUMAN),
PSYCHOMOTOR TESTS, PSYCHOMETRICS, UNDERWATER
EQUIPMENT (U)
IDENTIFIERS: SEALAB PROJECT (U)

FIELD STUDIES OF THE THREE 10 MEN TEAMS OF DIVERS
PARTICIPATING IN THE SEALAB II PROJECT WERE
UNDERTAKEN. DURING EACH TEAM'S 15 DAY SURMERGENCE
AT 205 FEET, PSYCHOMOTOR TESTS AND A VISION TEST WERE
CONDUCTED IN THE WATER, AND A MENTAL ARITHMETIC TEST
IN THE HABITAT. COMPARED TO BASE LINE PERFORMANCE
(DRY-LAND AND SHALLOW WATER CONDITIONS),
PERFORMANCE ON THE MENTAL ARITHMETIC TEST SHOWED NO
DETERIORATION WHILE PERFORMANCE ON THE PSYCHOMOTOR
TESTS SHOWED CONSIDERABLE DETERIORATION. MANY
DIVERS FOUND THAT THEIR IN-WATER ACTIVITIES PROCEEDED
SLOWLY; AMONG OTHER CAUSES OF A MORE PHYSICAL NATURE,
CONCERN FOR ONE'S SAFETY MAY DETRACT FROM THE AMOUNT
OF ATTENTION ONE GIVES TO THE TASK AT HAND. THE
MOST ACTIVE DIVERS IN THE SEALAB GROUP WERE THOSE
WHO INDICATED THAT THEY WERE LEAST FEARFUL AND LEAST
AROUSSED BY THE CONDITIONS AND WHO WERE HELPFUL,
GREGARIOUS, AND MADE LEAST TELEPHONE CONTACT WITH THE
OUTSIDE WORLD. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-635 656 13/10.1 6/11 8/1
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN

SEALAB I: A PERSONAL DOCUMENTARY ACCOUNT. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.

MAK 66 41P THOMPSON, ROBERT E. ;
REPT. NO. MR-66-4,
MONITOR: NAVMED MF011.99-9003.05

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•NAVAL RESEARCH, •UNDERWATER), NAVAL
PERSONNEL, LIFE SUPPORT, UNDERWATER VEHICLES,
CONFINED ENVIRONMENTS, MARINE BIOLOGY, FISHES,
BEHAVIOR, OCEANOGRAPHIC DATA, DECOMPRESSION,
UNDERWATER EQUIPMENT (U)
IDENTIFIERS: SEALAB (U)

THE AUTHOR WAS THE MEDICAL OFFICER PARTICIPANT IN THE GROUP OF FOUR MEN WHO SPENT TEN DAYS IN THE UNDERWATER HABITATION DESIGNATED SEALAB I IN JULY-AUGUST 1964. THIS IS A DAY BY DAY ACCOUNT OF THE EXPERIENCES AND PROBLEMS ENCOUNTERED BY THE AUTHOR DURING THE PREPARATION FOR THE EXPERIENCES AND PROBLEMS ENCOUNTERED BY THE AUTHOR DURING THE PREPARATION FOR THE EXPERIMENT, BEGINNING ON 28 APRIL, AND DURING THE ACTUAL TIME UNDERWATER AND DURING THE ASCENT TO THE SURFACE AND THE PERIOD OF DECOMPRESSION, TERMINATING ON THE FIRST OF AUGUST. THIS PARTICULAR SUBMARINE-QUALIFIED MEDICAL OFFICER WAS CHOSEN FOR THIS ASSIGNMENT IN THE SEALAB I PROJECT BECAUSE OF HIS PREVIOUS TRAINING IN THE FIELDS OF MARINE BIOLOGY AND DIVING MEDICINE. THIS PERSONAL ACCOUNT IS PUBLISHED AT THIS TIME AS A PART OF THE RECORD OF THE SEALAB SERIES OF PROJECTS, WHICH ARE PART OF THE LARGER MAN-IN-THE-SEA PROGRAM. HE DESCRIBES WHAT THEY ATE, HOW THEY SLEPT, DETAILS OF THEIR SORTIES INTO THE OCEAN AROUND THEM; PROBLEMS DUE TO CONTAMINATION OF THEIR ATMOSPHERE; THE FISH AND MARINE LIFE OBSERVED THROUGH THEIR PORTHULES OR ENCOUNTERED IN THEIR EXCURSIONS OUTSIDE THE SEALAB; AS WELL AS THEIR PSYCHOLOGICAL STATES, THEIR RELATIONSHIPS WITH EACH OTHER, AND THEIR COMMUNICATIONS WITH BOTH THE SUPPORT PERSONNEL TOPSIDE AND THEIR FAMILIES AT HOME. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-636 521 5/9 6//
NAVAL PERSONNEL PROGRAM SUPPORT ACTIVITY WASHINGTON D C
PERSONNEL RESEARCH LAB

A PRELIMINARY STUDY OF PERSONNEL AND TRAINING
REQUIREMENTS FOR DEEP SUBMERGENCE RESCUE VEHICLES
(USRV). (U)

JUN 66 45P PROPST, A. S. , JR.
REPT. NO. WRM-66-63,
PROJ: SQ46-15,
TASK: J,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SUBMARINE PERSONNEL, *NAVAL
TRAINING), (*SEA RESCUE EQUIPMENT, *DEEP
SUBMERGENCE), MAINTENANCE PERSONNEL,
OPERATORS (PERSONNEL), SUBMARINE ESCAPE,
SUBMARINES (U)

A REVIEW OF PROPOSED EQUIPMENTS FOR THE SYSTEM
INDICATES A REQUIREMENT FOR HIGHLY SKILLED AND
EXPERIENCED OPERATOR/MAINTENANCE PERSONNEL. IN
PARTICULAR, THE USRV OPERATOR/MAINTENANCE CREW WILL
REQUIRE HIGHLY SKILLED SUBMARINE QUALIFIED PERSONNEL.
THE REPORT INCLUDES A DESCRIPTION OF SYSTEM DESIGN
AND SUPPORT REQUIREMENTS AND CONTAINS ESTIMATES OF
PERSONNEL AND TRAINING REQUIREMENTS FOR MANNING THE
SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-638 15/ 5/9
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

PRELIMINARY ANALYSIS OF THE NEW LONDON SUBMARINE
PERFORMANCE REPORT.

(U)

SEP 43 SP JANTLETT, NEIL M. ;
REPT. NO. NMRL-2/

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINE PERSONNEL, SELECTION),
PERFORMANCE (HUMAN), CORRELATION TECHNIQUES

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-638 16J 8/16
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

FIELD TEST OF DARK ADAPTATION OF DIVERS. (U)

DESCRIPTIVE NOTE: REPT. NO. 1(FINAL).
JUL 46 16P EVERLEY, I. A.; KENNETT, WM. I
REPT. NO. NMML-106
PROJ: NAVMED-X-663

UNCLASSIFIED REPORT

DESCRIPTORS: (VISION, ADAPTATION(PHYSIOLOGY)),
(DIVING, VISION), NAVAL PERSONNEL, VISUAL
ACUITY, ILLUMINATION, EYEGLASSES, HELMETS,
OXYGEN, METEOROLOGICAL PARAMETERS (U)

DATA ARE PRESENTED ON 120 DIVES IN WATER OF A DEPTH OF 15 TO 18 FEET IN WHICH THE BOTTOM WAS VERY MUDDY AND TIDE AND CURRENT CONDITIONS SUCH AS TO MAKE THE ADVANTAGES OF DARK ADAPTATION DIFFICULT TO MEASURE. SUBJECTIVE IMPROVEMENT, HOWEVER, WAS REPORTED BY ALL 60 DIVERS. DATA ARE PRESENTED ON 42 DIVES IN 170 FEET OF WATER HALF OF WHICH WERE BY DARK-ADAPTED DIVERS WHO SHOWED DEFINITELY MEASURABLE IMPROVEMENT IN VISION AND WHO UNIVERSALLY EXPRESSED THEIR OPINION THAT DARK ADAPTATION IMPROVED UNDERWATER VISION MARKEDLY. PRELIMINARY EXPERIMENTS OF ROD AND CONE FUNCTION UNDER VARYING DEGREES OF ILLUMINATION AND OF OXYGEN TENSION ARE REPORTED. THE ADVANTAGES OF DARK ADAPTING DIVERS IS MORE EVIDENT ON DAYS IN WHICH METEOROLOGICAL AND OTHER CONDITIONS ARE SUCH AS TO PROVIDE LOW ILLUMINATION ON THE BOTTOM, THAT IS, ON DAYS DURING WHICH THE SUN IS PARTIALLY OR COMPLETELY OBSCURED. THE PRACTICABILITY OF DARK ADAPTING DIVERS BY DARK ADAPTATION GOGGLES WORN UNTIL THE DIVER WAS 'ON BOTTOM' HAS BEEN DEMONSTRATED. IT WAS FOUND THAT ONCE DARK-ADAPTED, A DIVER'S VISION WILL REMAIN CONSTANT UNLESS RADICAL CHANGE IN LIGHT INTENSITY OCCURS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-638 400 5/9 5/10
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

FUNCTIONS OF LOUDNESS DISCRIMINATION IN SUBMARINE
SONAR OPERATIONS. (U)

DESCRIPTIVE NOTE: REPT. NO. 1 ON PROJECT.
APR 45 3yP HARRIS, J. DONALD :
REPT. NO. NMML-57
PROJ: NAMED-A-53

UNCLASSIFIED REPORT

DESCRIPTORS: (SONAR PERSONNEL, SELECTION),
(PERFORMANCE TESTS, SONAR PERSONNEL), SONAR,
PITCH DISCRIMINATION, PSYCHOACOUSTICS, SUBMARINE
PERSONNEL, THRESHOLDS (PHYSIOLOGY), AUDITORY
ACUITY (U)

A RESUME IS GIVEN OF THE RESEARCH ON THE
RELATIONSHIP OF PURE-TONE LOUDNESS DISCRIMINATION TO
THE SUBMARINE SONAR PERFORMANCE. THE EXPERIENCE OF
THE LABORATORY SINCE JULY 1944 WITH AUDITORY
TEST NO. 7 OF THE HARVARD PSYCHO-ACOUSTIC
LABORATORY, 'LOUDNESS DISCRIMINATION FOR
BANDS OF NOISE' IS PRESENTED. THIS TEST, WHICH
REQUIRES A SUBJECT TO MAKE 110 JUDGMENTS AS TO
WHETHER A COMPLEX TONE (500-2000 C.P.S.) BECOMES
LOUDER OR SOFTER IN INTENSITY, IS SATISFACTORILY
RELIABLE WHEN ADMINISTERED AS A GROUP TEST WITH
LOUDSPEAKER (ODD-EVEN R = +.88). PERFORMANCE
ON THE TEST IS INDEPENDENT OF OVERALL INTENSITY LEVEL
OVER A RATHER WIDE RANGE. THE RELATION OF THE TEST
TO SONAR PERFORMANCE IS INVESTIGATED IN PRELIMINARY
EXPERIMENTS. NO CORRELATION EXISTS BETWEEN THE
TEST AND FINAL SOUND SCHOOL GRADES; BUT WHEN
CORRELATED AGAINST SPECIFIC AUDITORY SONAR
PERFORMANCES TO WHICH LOUDNESS DISCRIMINATION MAY
REASONABLY BE PRESUMED TO CONTRIBUTE, CORRELATIONS OF
THE ORDER .41 - .51 WERE OBTAINED. IN ADDITION,
SIGNIFICANT DIFFERENCES IN PERFORMANCE WERE FOUND
BETWEEN THOSE WHO DO POORLY AND THOSE WHO DO AVERAGE
OR BETTER ON THE TEST. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-639 029 5/5 5/8
PSYCHOLOGICAL CORP NEW YORK

THE USE OF HUMAN ENGINEERING DATA IN EQUIPMENT DESIGN
PROBLEMS. (U)

SEP 59 3JP COAKLEY, JOHN D. ;
CONTRACT: N60R1-151(U) ;
PROJ: 20-F-2,
MONITOR: NAVTRADEVCE 151-1-16

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (HUMAN ENGINEERING, MAN-MACHINE
SYSTEMS), DESIGN, MACHINES, OPERATIONS RESEARCH,
CONTROL SYSTEMS, DISPLAY SYSTEMS, SUBMARINES (U)

THE PURPOSE OF THE REPORT IS TO CITE EXAMPLES OF
DESIGN PROBLEMS WHICH ARE TYPICAL OF THOSE
ENCOUNTERED IN CONSULTING WORK. THE MANNER IN WHICH
RECOMMENDATIONS ARE DERIVED BY RECONCILING PERTINENT
EXPERIMENTAL DATA WITH THE SPECIFIC REQUIREMENTS OF
THE EQUIPMENT IS DISCUSSED. THE CASES CITED
ILLUSTRATE THE VARIOUS DEGREES OF CONFIDENCE WITH
WHICH RECOMMENDATIONS ARE MADE, AND POINT UP THE
AREAS IN WHICH FURTHER RESEARCH IS NEEDED. THE
EXAMPLES ARE GATHERED FROM STUDIES OF EQUIPMENT
DESIGNED FOR USE ABOARD SUBMARINES. HOWEVER, THE
PROBLEMS ENCOUNTERED AND THE METHOD OF APPROACH ARE
PROBABLY TYPICAL OF LARGE AREAS IN THE FIELD OF
APPLIED HUMAN ENGINEERING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-639 170 13/10.1
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

MINIMAL RED LIGHT LEVELS ON BOARD SUBMARINES. (U)

DESCRIPTIVE NOTE: MEMO REPT.

JAN 60 OP DIMMICK, FORREST L. ;
REPT. NO. MR-60-2,
MONITOR: NAVMED MK005-14-1100.06

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (SUBMARINES, LIGHTING EQUIPMENT),
(SUBMARINE PERSONNEL, VISUAL ACUITY),
ADAPTATION (PHYSIOLOGY), VISION, COLORS,
BRIGHTNESS (U)

SPECIFIC LIMITING BRIGHTNESS VALUES WERE DETERMINED FOR LIGHT SOURCES AND WORKING SURFACES FOR SUBMARINE COMPARTMENTS WHERE RED LIGHTING IS REQUIRED, IN ORDER TO PROVIDE ADEQUATE SEEING CONDITIONS UNDER RED LIGHT WITH MINIMUM INTERFERENCE TO DARK-ADAPTED PERSONNEL. SINCE ACUITY DECREASES AS THE LEVEL OF ILLUMINATION IS LOWERED, WHEREAS DARK ADAPTATION INCREASES, ANY SPECIFICATIONS OF BRIGHTNESS LEVELS CAN BE NO MORE THAN A WORKABLE COMPROMISE BETWEEN THE TWO REQUIREMENTS. ACCORDINGLY, INITIAL ADAPTATION SHOULD BE MADE UNDER THE BEST POSSIBLE CONDITIONS, THAT IS UNDER THE LOWEST FEASIBLE RED ILLUMINATION WHEREIN THE MEN CAN PERFORM NECESSARY TASKS. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-635 625 6/19 5/9
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

OBSERVATIONS ON EFFICIENCY OF SUBMARINE PERSONNEL
DURING PROLONGED SUBMERGENCE WHEN THE ATMOSPHERIC
OXYGEN IS MAINTAINED AT 17% AND THE CARBON DIOXIDE AT
3%. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 45 51P KARLIN, J. E. ; CURTIS, J. F. ;
REPT. NO. NAKL-70
PROJ: NAVMED-X-516

UNCLASSIFIED REPORT

DESCRIPTORS: (1) STRESS (PHYSIOLOGY), SUBMARINE
PERSONNEL, (2) SUBMARINE PERSONNEL,
PERFORMANCE (HUMAN), (3) RESPIRATION, SUBMARINE
PERSONNEL, OXYGEN, CARBON DIOXIDE, PHYSICAL
FITNESS, VISUAL PERCEPTION, VOICE COMMUNICATION
SYSTEMS, CLOSED ECOLOGICAL SYSTEMS, VISUAL
PERCEPTION, RADAR OPERATORS, SONAR PERSONNEL,
HEARING, SPEECH, MEMORY, COLOR VISION,
ATTENTION, TESTS (U)

THE PURPOSE OF THIS INVESTIGATION WAS TO DETERMINE
WHETHER THE OPERATING EFFICIENCY OF SUBMARINE
PERSONNEL DETERIORATED DURING SUBMERGENCE WHEN THE
ATMOSPHERIC OXYGEN WAS MAINTAINED AT 17% AND THE
CARBON DIOXIDE AT 3% FOR EXTENDED PERIODS. THE
RESULTS OF THE OBSERVATIONS SHOW: (A) VERY
DEFINITELY DECREASED CAPACITY FOR PHYSICAL WORK FOR
ALL HANDS. (B) VERY DEFINITE DECREASE IN
EFFICIENCY OF NIGHT VISION FOR ABOUT ONE THIRD OF THE
SHIP'S COMPANY. (C) INDICATIONS OF MARKED
DECREMENT IN MENTAL EFFICIENCY FOR ALL HANDS. (D)
VERY PROBABLE DECREASE IN EFFICIENCY OF INTERIOR
VOICE COMMUNICATIONS. (E) NOTICEABLE, BUT
UNPROVEN, TENDENCY TOWARDS GENERAL DECREASE IN
EFFICIENCY OF RADAR WATCH AND WATCH ON THE BOW AND
STERN PLANES. (F) NO INDICATION OF DETERIORATION
IN STRAIGHTFORWARD LISTENING PERFORMANCE FOR SONAR
SIGNALS. (G) NO RELIABLE EVIDENCE EITHER ON
EFFICIENCY IN WATCHING THE 'CHRISTMAS TREE' OR
MEMORY FOR NUMBERS. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-641 561 17/1 13/12
NAVY MINE DEFENSE LAB PANAMA CITY FLA

THE DEVELOPMENT OF A SWIMMER TRACKING DEVICE. (U)

DESCRIPTIVE NOTE: INTERIM REPT., JUL 65-JAN 66,
UCT 66 24P MULLEN, R. W. ;
REPT. NO. 1-108
PROJ: SF-G11-06-03
TASK: 11507

UNCLASSIFIED REPORT

DESCRIPTORS: (*SWIMMING, UNDERWATER TRACKING),
(*UNDERWATER TRACKING, ACOUSTIC EQUIPMENT),
(*DIVING, SAFETY DEVICES), SONAR RECEIVERS,
TRANSISTORS, OSCILLATORS, TRANSDUCERS, NAVAL
TRAINING (U)

A SWIMMER TRACKING DEVICE CONSISTING OF ACOUSTIC MARKERS AND A RECEIVER HAS BEEN DEVELOPED BY THE U. S. NAVY MINE DEFENSE LABORATORY TO PROVIDE A MEANS OF TRACKING NAVY SWIMMERS DURING TRAINING EXERCISES. THE ACOUSTIC MARKERS ARE TUNABLE FROM 29 KHZ (1810HERTZ, KILOCYCLES PER SECOND) TO 45 KHZ AND MAY BE MANUALLY SWITCHED BETWEEN CONTINUOUS WAVE (*) AND PULSE MODES OF OPERATION. THE RECEIVER IS A MARK 16 MOD 0 SONAR RECEIVER MODIFIED TO IMPROVE ITS SELECTIVITY AND IMAGE REJECTION. WITH THE MODIFIED RECEIVER LOCATED ON A SAFETY BOAT, THE BEARINGS TO MARKERS LOCATED ON SWIMMERS CAN BE DETERMINED, AND THEY CAN BE IDENTIFIED BY THEIR MARKER FREQUENCIES. AS MANY AS SEVENTEEN SWIMMER PAIRS CAN BE TRACKED, EVEN AT DISTANCES EXCEEDING 1000 YARDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 /34 13/10.1 5/5 17/8
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF
SUBMARINE EQUIPMENT. THE KOLLMORGEN ANY-HEIGHT
PERISCOPE. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 9,
FEB 48 BP TOLCOTT, MARTIN A.; CHANNELL,
RALPH C. ;
CONTRACT: N60R1-151101)
PROJ: SPECDEVCEM-20-F-2
MONITOR: SPECDEVCEM 151-1-7

UNCLASSIFIED REPORT

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DESCRIPTORS: (*SUBMARINE PERISCOPES, *HUMAN
ENGINEERING), DESIGN, SUBMARINES, CONTROL KNOBS (U)

THE SPECIFICATIONS FOR THE SUBMARINE ATTACK
PERISCOPE, FIXED EYE PIECE TYPE (TYPE VI), WERE
EXAMINED. PARTICULAR ATTENTION HAS BEEN GIVEN TO
THE CONTROLS AND DISPLAYS FROM THE STANDPOINT OF
HUMAN OPERATION. THE REPORT PRESENTS, FOR THE MOST
PART, COMMENTS ABOUT EACH CONTROL AND INDICATOR, AND
A ROUGH SKETCH IS INCLUDED INDICATING ONE POSSIBLE
ARRANGEMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-642 736 13/10.1 5/5
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF
SUBMARINE EQUIPMENT: ANALYSIS OF EQUIPMENT RATINGS
AND PROPOSED LAYOUT OF SUBMARINE ATTACK CENTER. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 8,
NOV 47 21P CHANNELL, RALPH C. ;TOLCOTT,
MARTIN A. ;
CONTRACT: N60R1-151(U)
MONITOR: SPECDEVLEN 151-1-6

UNCLASSIFIED REPORT

Reproduced from
best available copy. 

DESCRIPTORS: (*SUBMARINES, *HUMAN ENGINEERING),
SUBMARINE PERSONNEL, OFFICER PERSONNEL, UNDERSEA
WARFARE (U)

AS PART OF THE PROJECT TO DETERMINE THE OPTIMAL
ARRANGEMENT OF EQUIPMENT IN THE ATTACK CENTER OF THE
NEWLY DESIGNED SUBMARINE, OFFICERS WERE REQUESTED TO
RANK VARIOUS PIECES OF EQUIPMENT IN ORDER OF
IMPORTANCE TO THEM DURING THE APPROACH AND ATTACK
PHASES OF A SUBMERGED ATTACK. THESE RANKINGS WERE
MADE FROM THE POINTS OF VIEW OF FOUR DIFFERENT
OFFICERS: ATTACK OFFICERS, FIRE CONTROL
OFFICERS, ANALYZER OPERATORS AND POSITION
KEEPER OPERATORS. ON THE BASIS OF THE OBTAINED
RANKINGS A PRELIMINARY PLAN WAS DEVELOPED FOR
ARRANGING THE EQUIPMENT TO SUIT THE REQUIREMENTS OF
THESE OFFICERS. IT IS RECOGNIZED THAT COMPROMISES
WILL BE NECESSARY DUE TO CERTAIN ENGINEERING
REQUIREMENTS. THE LOCATION OF SOME GEAR WAS
ALREADY DETERMINED IN ACCORDANCE WITH THESE
REQUIREMENTS, AND THE PLACEMENT OF OTHER GEAR MAY BE
AFFECTED BY THE PREVIOUS INSTALLATION OF CABLES,
PIPES, BEAMS, ETC. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 /35 13/10.1 5/5 17/8
PSYCHOLOGICAL CORP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF
SUBMARINE EQUIPMENT, KULLMORGEN ANY HEIGHT PERISCOPE,
HUMAN FACTORS IN THE OPERATION OF. (U)

UC1 47 8P
CONTRACT: H60R1-151(U)
MONITOR: SPECDEVLEN 151-1-5

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINE PERISCOPES, HUMAN
ENGINEERING), DESIGN, SUBMARINES, OPERATION,
CONTROL KNOBS, DISPLAY SYSTEMS (U)

THE CONTROLS AND DISPLAYS WERE CONSIDERED WITH
REFERENCE TO SIZE, SHAPE, LOCATION, VISIBILITY, EASE
OF MANIPULATION, AND OTHER FACTORS ESSENTIAL FOR
MAXIMAL EFFICIENCY OF OPERATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 737 13/10.1 5/5
PSYCHOLOGICAL COMP NEW YORK

THE HUMAN FACTOR IN THE DESIGN AND LAYOUT OF
SUBMARINE EQUIPMENT: ANALYSIS OF WAR PATROL REPORTS
AND INTERVIEWS. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 6,
SEP 47 24P TOLCOTT, MARTIN A. ; CHANNELL,
RALPH C. ;
CONTRACT: N6CR1-151(D1)
MONITOR: SPECDEVLEN 151-1-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUBMARINES, *HUMAN ENGINEERING),
SUBMARINE PERSONNEL, DESIGN, CONTROL SYSTEMS,
DISPLAY SYSTEMS (U)

PERTINENT COMMENTS ON THE FOLLOWING ASPECTS OF THE
MAN-MACHINE RELATIONSHIP ARE SUMMARIZED: (A)
MODIFICATIONS OF CURRENT EQUIPMENT TO SIMPLIFY
PERCEPTION OF DISPLAYS AND OPERATION OF CONTROLS.
(B) LOCATION OF EQUIPMENT FOR MOST EFFICIENT
OPERATIONS. (C) PROBLEMS OF INTRA-CRAFT AND
INTER-CRAFT COMMUNICATION. (D) RECOMMENDED FIRE
CONTROL PROCEDURES. (E) EXAMPLES OF MECHANICAL
AND HUMAN ERRORS. (F) TRAINING OF PERSONNEL.
(G) PROBLEMS OF HEALTH, FATIGUE AND MORALE.
(H) REQUESTS FOR NEW EQUIPMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 738 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN FACTORS IN THE DESIGN OF THE SUBMARINE DIVING
CONTROL STATION. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,
UCT 48 35P TRABOLD, FREDERICK W. ;
TOLCOTT, MARTIN A. ; CHANNELL, RALPH C. ;
CONTRACT: NBUNR-641 (U1)
PROJ: SPECDEV CEN-20-F-5
MONITOR: SPECDEV CEN 641-1-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUBMARINES, DIVING), (*DIVING,
CONTROL PANELS), SUBMARINE PERSONNEL, HUMAN
ENGINEERING, INDICATOR LIGHTS, DEPTH INDICATORS,
DISPLAY SYSTEMS, TRAINING DEVICES, UNDERWATER
VEHICLES, MARINE ENGINEERING (U)

THE PURPOSES OF THE STUDY WERE TO: MAKE A
FUNCTIONAL ANALYSIS OF THE DIVING STATION TRAINER;
COMPARE OPERATIONS OF CONTROLS ABOARD SHIP WITH
OPERATIONS OF THE TRAINER CONTROLS; INTERVIEW DIVING
OFFICERS AND PLANESMEN TO OBTAIN SUPPLEMENTARY
INFORMATION AND TO EXCHANGE VIEWS ON RE-DESIGNING OF
DISPLAYS; DEVELOP AND SUBMIT RECOMMENDATIONS FOR
MODIFICATION OF THE TRAINER DISPLAYS; PROVIDE
ENGINEERING ADVICE WITH RESPECT TO THE CONSTRUCTION
OF THE MODIFIED EQUIPMENT; AND EVALUATE THE MODIFIED
EQUIPMENT AFTER INSTALLATION ON THE TRAINER. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-642 734 13/10 5/9
DUNLAP AND ASSOCIATES INC STAMFORD CONN

PERFORMANCE OF CONTROLLERHIN IN THE PROPULSION
CUBICLE OF GUPPY SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 44 62P COAKLEY, JOHN D. ;THABOLD,
FREDERICK W. ;CHANNELL, RALPH C. ;
CONTRACT: N8011R-641(U2)
PROJ: SPECDEVLEN-20-F-2 ,NR-784-U02
MONITOR. SPECDEVLEN 641-2-1

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINES, MANEUVERABILITY),
(SUBMARINE PERSONNEL, PSYCHOMETRICS), MARINE
PROPULSION, CONTROL PANELS, HUMAN ENGINEERING,
PERFORMANCE(HUMAN), UNDERWATER PROPULSION,
TRAINING, PHOTOGRAPHIC ANALYSIS, DISPLAY SYSTEMS,
HANDS (U)
IDENTIFIERS: GUPPY (U)

THE PURPOSE OF THIS STUDY WAS TO DETERMINE IF THE
APPLICATION OF HUMAN ENGINEERING PRINCIPLES COULD
IMPROVE THE PERFORMANCE OF CONTROLLERHIN AND
THROUGH SUCH IMPROVEMENT INCREASE THE MANEUVERABILITY
OF THE SUBMARINE. THE FIRST STEP IN SUCH A STUDY
WAS TO DESCRIBE AND EVALUATE THE PRESENT PERFORMANCE
OF CONTROLLERHIN. AS A RESULT OF THIS
EVALUATION, RECOMMENDATIONS HAVE BEEN MADE WHICH
SHOULD RESULT IN IMPROVED SUBMARINE OPERATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 799 5/5 13/10.1
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN FACTORS IN THE DESIGN OF THE SUBMARINE CONTROL
ROOM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
UCT 49 62P CHANNEL, RALPH C. ;
CONTRACT: NBUNK-641 (U2)
PROJ: NK-784-002, SPECDEVLEN-20-F-2
MONITOR: SPECDEVLEN 641-2-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN ENGINEERING SYSTEMS
STUDIES.

DESCRIPTORS: (*SUBMARINES, *HUMAN ENGINEERING),
DESIGN, CONTROL SYSTEMS, PERFORMANCE (HUMAN),
SUBMARINE PERSONNEL, OPERATION (U)

THE PURPOSE OF THIS REPORT IS TO MAKE
RECOMMENDATIONS FOR IMPROVING THE DESIGN AND
OPERATION OF THE CONTROL ROOM IN THE SS 563/
564. THE EMPHASIS IS UPON THE GENERAL ARRANGEMENT
OF EQUIPMENT AND PERSONNEL, ALTHOUGH CONTROLS AND
INDICATORS ON PRESENT SUBMARINES ARE ALSO EVALUATED.
WHERE PRESENT EQUIPMENT IS DUPLICATED IN THE SS
563/564, THE SPECIFIC CRITICISMS AND RECOMMENDATIONS
APPLY DIRECTLY TO THE NEW SUBMARINES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 60U 13/10.1 5/5 5/8
DUNLAP AND ASSOCIATES INC STAMFORD CONN

MODIFICATION OF THE DESIGN OF VISUAL DISPLAYS IN THE
MANEUVERING ROOM OF GUPPY SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 49 46P COAKLEY, JOHN D. ; THABOLD,
FREDERICK W. ; CHANNELL, RALPH C. ;
CONTRACT: N80NR-641 (U2)
PROJ: NR-784-002, SPECDEVCEM-20-F-2
MONITOR: SPECDEVCEM 641-2-3

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINES, HUMAN ENGINEERING),
(DISPLAY SYSTEMS, DESIGN), VISUAL PERCEPTION,
SUBMARINE PERSONNEL, CONTROL SYSTEMS (U)

FOR PURPOSES OF ANALYSIS, THE DISPLAYS WERE DIVIDED
INTO TWO MAIN GROUPS: (A) INSTRUMENTS PROVIDING
QUANTITATIVE INFORMATION OF PRIMARY IMPORTANCE TO THE
CONTROLLERMEN, AND (B) ACCESSORY INSTRUMENTS
PERMITTING FEW, IF ANY, QUANTITATIVE READINGS. THE
ANALYSIS REVEALED THAT: (1) THERE ARE MANY
VIOLATIONS OF THE GUIDING PRINCIPLES OF HUMAN
ENGINEERING. (2) THE INSTRUMENTS HAVE NOT BEEN
ORGANIZED INTO A SYSTEM OF DISPLAYS FROM WHICH THE
OPERATOR MAY OBTAIN PRECISELY THE REQUIRED
INFORMATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-642 835 6/11
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

ENVIRONMENT CONTROL IN PRESSURIZED UNDERWATER
HABITATS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 66 3JP BECK, E. J. ;
REPT. NO. NCEL-TR-496
PROJ: Y-FU15-01-U99-003

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONTROLLED ATMOSPHERES, UNDERWATER),
(*UNDERWATER VEHICLES, LIFE SUPPORT), (*UNDERWATER
EQUIPMENT, LIFE SUPPORT), DIVING, DEEP
SUBMERGENCE, CLOSED ECOLOGICAL SYSTEMS, OXYGEN
EQUIPMENT, DECOMPRESSION SICKNESS, HEAT TRANSFER,
SPEECH, HELIUM, PURIFICATION, WATER SUPPLIES,
HEATING, SANITARY ENGINEERING, POWER SUPPLIES,
FOOD
IDENTIFIERS: UNDERWATER HABITATS, *CLEAN
ROOMS

(U)

(U)

A STUDY WAS MADE TO IDENTIFY THOSE ENVIRONMENTAL
FACTORS WHICH WOULD HAVE TO BE CONTROLLED IN ORDER
THAT MAN COULD LIVE AND WORK BENEATH THE SEA. THE
STATE OF THE ART OF UNDERSEA HABITATION IS DESCRIBED.
LIMITATIONS AND AREAS OF POSSIBLE MAJOR IMPROVEMENTS
ARE LISTED, AND POSSIBLE APPROACHES TO MAJOR
IMPROVEMENTS ARE OUTLINED. THE DEVELOPMENTAL
ROUTES SUGGESTED ARE AIMED AT REDUCING COST AND
COMPLEXITY, ESTABLISHING MORE NORMAL ENVIRONMENTS,
AND, ABOVE ALL, REDUCING THE HAZARDS OF WORKING IN
THE OCEAN. ENVIRONMENTAL FACTORS CONSIDERED ARE
ATMOSPHERE, SANITATION, FOOD STORAGE AND PREPARATION,
HEATING, AND THE EFFECTS OF SPECIAL ATMOSPHERES ON
VOICE COMMUNICATION. THE PECULIAR REQUIREMENTS FOR
PROVIDING A TOLERABLE ATMOSPHERE AT ANY BUT THE
SHALLOWEST DEPTHS HAVE, BY KNOWN APPROACHES, PRODUCED
MAJOR CHANGES IN ALL OTHER AREAS. ALTHOUGH THE
TREATMENT IN THIS REPORT IS FROM AN ENGINEERING
STANDPOINT, THE PROBLEMS ARE LARGELY PHYSIOLOGICAL.
AN EFFORT IS MADE TO DESCRIBE THE PROBLEM IN TERMS
FAMILIAR TO ENGINEERS WORKING IN THE FIELD OF
ENVIRONMENT CONTROL, ALTHOUGH SOME OF THE MORE
IMPORTANT REFERENCES NECESSARILY OVERLAP INTO
MEDICINE AND PHYSIOLOGY. (AUTHOR)

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 115 13/10 1978
DUNLAP AND ASSOCIATES INC STAMFORD CONN

A HUMAN ENGINEERING STUDY OF THE FORWARD TORPEDO ROOM
IN THE 563/564 CLASS SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 51 73P CASPERSON, R. ; CHANNELL, RALPH
C. ;

CONTRACT: N80NN-641(U2)
PROJ: SPECDEVLEN-20-F-2 , NR-784-J02
MONITOR: SPECDEVLEN 641-2-11

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUBMARINES, DESIGN), (*TORPEDOES,
FIRE CONTROL SYSTEMS), HUMAN ENGINEERING, CONTROL
PANELS, OPERATORS(PERSONNEL), UNDERWATER
PROJECTILES, POSITION FINDING, UNDERWATER EQUIPMENT,
MINELAYING (U)

A HUMAN ENGINEERING STUDY HAS BEEN MADE OF THE
FORWARD TORPEDO ROOM IN THE 563/564 CLASS SUBMARINE.
THE MAJOR OBJECTIVES OF THIS STUDY WERE TO ANALYZE
TORPEDO FIRING AND MINE PLANTING OPERATIONS AND TO
DEVELOP RECOMMENDATIONS FOR THE IMPROVEMENT OF
OVERALL EFFICIENCY IN THE TORPEDO ROOM.
OBSERVATIONS OF TORPEDO ROOM ACTIVITY, MADE WITH
THE AID OF MOTION PICTURES, SOUND RECORDERS, AND STOP
WATCHES, PROVIDED MOST OF THE DATA NECESSARY FOR
ACTIVITY ANALYSIS AND TASK ALLOTMENTS FOR PRESENT
SUBMARINES. INTERVIEW AND QUESTIONNAIRE MATERIAL
OBTAINED FROM EXPERIENCED PERSONNEL REVEALED
SHORTCOMINGS OF PRESENT DESIGNS AND PROCEDURES AND
PROVIDED INFORMATION CONCERNING MINE PLANTING
ACTIVITIES. FINALLY, A HUMAN ENGINEERING ANALYSIS
OF PRESENT TORPEDO ROOMS, COMBINED WITH A KNOWLEDGE
OF THE PROJECTED DESIGN OF THE SS 563/564, PROVIDED
A BASIS FOR RECOMMENDATIONS CONCERNING ARRANGEMENT
AND DESIGN OF EQUIPMENT AND TASK ALLOTMENTS FOR
FUTURE SUBMARINES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 116 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN ENGINEERING STUDY OF THE AGSS569 CONTROL ROOM.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 52 68P TRABOLD, FREDERICK W. ; KELLEY,
CHARLES R. ; ELY, JEROME H. ; CHANNELL, RALPH C. ;

CONTRACT: NBUNR-641 (U2)
PROJ: SPECDEV CEN-20-F-2 , NR-784-U02
MONITOR: SPECDEV CEN 641-2-15

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUBMARINES, DESIGN), (*HUMAN
ENGINEERING, SUBMARINES), CONTROL SYSTEMS,
SUBMARINE PERSONNEL, INSTRUMENT PANELS,
ILLUMINATION, SEATS, OPERATORS (PERSONNEL),
SUBMARINE PERISCOPES, DIVING

(U)

THE PURPOSE OF THIS REPORT IS TO PRESENT
RECOMMENDATIONS DESIGNED TO IMPROVE THE PERFORMANCE
OF OPERATIONS WITHIN THE CONTROL ROOM OF THE
AGSS569 SUBMARINE. EMPHASIS IS PLACED ON THE
LAYOUT OF STATIONS AND EQUIPMENT, THE DESIGN OF
CONTROLS AND INSTRUMENTS, THE ILLUMINATION OF THE
DISPLAYS, AND CORRECT SEATING FOR THE OPERATORS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 117 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

LAYOUT, COMMUNICATION AND SEATING IN THE AIR CONTROL
CENTER OF THE MIGRAINE III TYPE SUBMARINE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 52 47P BRIDGEWATER, JOHN B. KELLY,
JEROME H. CHAMWELL, RALPH C. ;
CONTRACT: N8UNH-641(U2)
PROJ: SPLCDEVCECEN-2U-F-2 ,NR-784-U02
MONITOR: SPLCDEVCECEN 641-2-14

UNCLASSIFIED REPORT

DESCRIPTIONS: (SUBMARINES, AIR CONTROL CENTERS),
(AIR CONTROL CENTERS, HUMAN ENGINEERING),
COMMUNICATION SYSTEMS, SEATS,
OPERATORS (PERSONNEL), RADAR EQUIPMENT, DISPLAY
SYSTEMS, PICKET SHIPS, UNDERWATER VEHICLES (U)
IDENTIFIERS: MIGRAINE III SUBMARINE (U)

THE PURPOSE OF THIS REPORT IS TO PRESENT THE
FINDINGS OF A HUMAN ENGINEERING STUDY OF THE AIR
CONTROL CENTER (ACC) OF THE MIGRAINE III
TYPE SUBMARINE. THIS STUDY WAS ORIGINALLY DESIGNED
TO DEVELOP A LAYOUT OF WORKPLACES AND MAJOR PIECES OF
EQUIPMENT IN THE ACC. UPON COMPLETION OF THE
RECOMMENDED LAYOUT, HOWEVER, THE STUDY WAS BROADENED
TO INCLUDE AN EVALUATION OF COMMUNICATIONS PROCEDURES
AND SEATING REQUIREMENTS WITHIN THE ACC. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 153 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

ARRANGEMENT OF EQUIPMENT ON THE SSK CONVERSION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 50 1st TOLCOTT, MARTIN A. ;
CONTRACT: NBUNR-641(U2)
PROJ: NR-784-UU2 ,SPECDEVCEM-20-F-2
MONITOR: SPECDEVCEM 641-2-5

UNCLASSIFIED REPORT

DESCRIPTORS: (*ANTISUBMARINE WARFARE, SUBMARINES),
(*SUBMARINES, HUMAN ENGINEERING), ANTISUBMARINE
FIRE CONTROL SYSTEMS, SONAR, SUBMARINE PERSONNEL,
UNDERWATER COMMUNICATION SYSTEMS, KADAM,
ANTISUBMARINE DEFENSE SYSTEMS, UNDERSEA WARFARE (U)

THE SSK CONVERSION IS A MODIFICATION OF THE SS
214 RESULTING FROM EXTENSIVE INTERIOR AND EXTERIOR
STRUCTURAL CHANGES AND THE ADDITION OF CERTAIN SONAR
AND FIRE CONTROL EQUIPMENT. ITS PRIMARY MISSION
WILL BE TO SERVE AS AN ANTI-SUBMARINE SUBMARINE, AND
IT HAS BEEN EQUIPPED TO HOVER ON STATION FOR THE
PURPOSE OF DETECTING AND ATTACKING ENEMY SUBMARINES.
SINCE NEW PRINCIPLES OF OPERATION ARE INVOLVED, THE
BUREAU OF SHIPS THROUGH SPECIAL DEVICES
CENTER HAS REQUESTED THAT A HUMAN ENGINEERING STUDY
BE MADE TO DETERMINE THE OPTIMAL ARRANGEMENT OF THE
SYSTEM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 154 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN FACTORS IN THE DESIGN OF SUBMARINE
COMMUNICATION SYSTEMS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 50 7JP GIRDEN, E. ;
CONTRACT: N8UNR-641(U2)
PROJ: NR-784-002 ,SPECDEV CEN-20-F-2
MONITOR: SPECDEV CEN 641-2-8

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER COMMUNICATION SYSTEMS,
SUBMARINES), (SUBMARINES, DESIGN), HUMAN
ENGINEERING, PUBLIC ADDRESS SYSTEMS, SUBMARINE
PERSONNEL, SONAR, UNDERSEA WARFARE,
MANEUVERABILITY, DATA TRANSMISSION SYSTEMS (U)

THE INCREASED SPEED AND MANEUVERABILITY OF MODERN
SUBMARINES DEMAND EXTREMELY EFFICIENT COMMUNICATIONS.
THE PRESENT REPORT IS CONCERNED WITH IMPROVING THE
FLOW OF INFORMATION BETWEEN THE VARIOUS COMPARTMENTS
ON FLEET AND GUPPY SUBMARINES. THE EMPHASIS IS
UPON THE OPTIMUM DESIGN AND USE OF COMMUNICATION
CIRCUITS. VALUABLE INFORMATION WAS OBTAINED FROM A
COMMUNICATIONS QUESTIONNAIRE, RESPONDED TO BY ALL 44
ACTIVE SUBMARINES IN THE ATLANTIC FLEET.
ADDITIONAL EVIDENCE WAS COLLECTED THROUGH EXTENSIVE
OBSERVATIONS, SOUND RECORDINGS, AND INTERVIEWS.
THE DATA WERE ANALYZED TO DETERMINE (1) THE
ESSENTIAL COMMUNICATIONS DURING VARIOUS PHASES OF
OPERATION, (2) THE EXTENT TO WHICH CURRENT
PROCEDURES SATISFY THESE REQUIREMENTS, AND (3)
THE CHANGES AND IMPROVEMENTS WHICH ARE NEEDED. (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-643 155 13/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

HUMAN ENGINEERING APPRAISAL OF THE AIR CONTROL CENTER
OF PICKET SUBMARINES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JEC 50 78P ELY, JEROME H. ; JACOBS,
HERBERT H. ; WEIGANDT, JOSEPH H. ; CHANNELL, RALPH
C. ;

CONTRACT: NBUNR-641 (U2)
PROJ: NR-784-002, SPECDEV CEN-2U-F-2
MONITOR: SPECDEV CEN 641-2-1U

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUBMARINES, AIR CONTROL CENTERS),
(*AIR CONTROL CENTERS, HUMAN ENGINEERING), PICKET
SHIPS, SUBMARINE PERSONNEL, SEARCH RADAR,
DETECTION, RADAR OPERATIONS, INTERCEPTION,
PLOTING BOARDS (U)

THIS STUDY HAS BEEN DESIGNED TO EVALUATE THE AIR
CONTROL CENTER (ACC) OF THE PICKET SUBMARINE
FROM A HUMAN ENGINEERING VIEWPOINT AND TO MAKE
RECOMMENDATIONS CONCERNING ITS OPERATING PROCEDURES
AND ARRANGEMENT OF EQUIPMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 655 :3/10
DJNLAP AND ASSOCIATES INC STAMFORD CONN

SUBMARINE CONTROL BY A SINGLE OPERATOR. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
OCT 53 132P KELLEY, CHARLES H. ; ELY,
JEROME H. ; CHANNELL, RALPH C. ;
CONTRACT: NONR-954(OU)
PROJ: SPECDEVGEN-20-F-2
MONITOR: SPECDEVGEN 954-UU-18

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINES, CONTROL PANELS),
(CONTROL PANELS, OPERATORS(PERSONNEL)),
SUBMARINE PERSONNEL, HUMAN ENGINEERING, CONTROL
SYSTEMS, DESIGN, PERFORMANCE(ENGINEERING),
INSTRUMENTATION, POSITIONING REACTIONS, CONTROL
KNOBS (U)

THIS REPORT IS AN ANALYSIS OF SOME OF THE PROBLEMS
INVOLVED IN ONE-MAN SUBMARINE CONTROL. IT IS AN
ATTEMPT TO STUDY SYSTEMATICALLY THE SUBMARINE CONTROL
SYSTEM, ASSUMING THERE IS A SINGLE HUMAN LINK BETWEEN
THE SENSING INSTRUMENTS MEASURING THE SUBMARINE'S
PERFORMANCE AND THE CONTROL SURFACES USED TO MINIMIZE
ERRORS IN THIS PERFORMANCE. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-643 828 13/10 5/10
DUNLAP AND ASSOCIATES INC STAMFORD CONN

ILLUMINATION IN THE ATTACK CENTER AND PERISCOPE AREA
OF THE SS 563/564. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
AUG 49 47P ORLANSKY, JESSE ; GIRDEN,
EDWARD ; CHAN, GRACE S. ; CHANNELL, RALPH C. ;
CONTRACT: N60NR-541 (U2)
PROJ: NR-784-002, SPECDEV CEN-20-F-2
MONITOR: SPECDEV CEN 641-2-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN ENGINEERING
SYSTEM STUDIES.

DESCRIPTORS: (*SUBMARINES, ILLUMINATION),
(*ILLUMINATION, SPECIFICATIONS), SUBMARINE
PERISCOPES, LIGHTING EQUIPMENT, SUBMARINE PERSONNEL,
ADAPTATION (PHYSIOLOGY), VISION, BRIGHTNESS,
PERFORMANCE (HUMAN), HUMAN ENGINEERING (U)

THIS REPORT EVALUATES THE ROOM AND INSTRUMENT
ILLUMINATION REQUIRED FOR EFFICIENT PERFORMANCE IN
THE ATTACK CENTER AND PERISCOPE AREA OF THE
CLASS 563/564 SUBMARINE. COGNIZANT NAVY
PERSONNEL WERE INTERVIEWED TO DETERMINE PROBABLE
OPERATIONAL PROCEDURES IN THE ATTACK CENTER AND
PERISCOPE AREA. THE IMPLICATION OF THESE
PROCEDURES FOR ILLUMINATION WAS CONSIDERED. THEN,
PROVISIONAL LIGHTING SPECIFICATIONS WERE DEVELOPED
FOR THESE AREAS. IN DOING SO, ATTENTION WAS PAID
TO THE CURRENT NAVY SPECIFICATIONS AND TO THE
RELEVANT LITERATURE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-648 933 17/2 20/1 5/10
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

UNDERWATER SPEECH COMMUNICATION. (U)

DESCRIPTIVE NOTE: SEMIANNUAL PROGRESS REPT. NO. 4,
FEB 67 O.P. HOLLIER, HARRY ; BRANDT, JOHN ;
THOMPSON, CARL ;
CONTRACT: NONR-560(2U)

UNCLASSIFIED REPORT

DESCRIPTORS: (VOICE COMMUNICATION SYSTEMS,
UNDERWATER), SOUND TRANSMISSION, UNDERWATER
SOUND, SPEECH, INTELLIGIBILITY, HEARING,
THRESHOLDS(PHYSIOLOGY), AUDITORY ACUITY,
HYDROPHONES, UNDERWATER SOUND EQUIPMENT, SCUBA
DIVERS, SPEECH RECOGNITION (U)

A LIST IS GIVEN OF RESEARCH REPORTS, BOTH COMPLETED
AND IN PROGRESS, IN THE FIELD OF UNDERWATER SPEECH
COMMUNICATION. PLANNED RESEARCH PROJECTS INCLUDE
HEARING STUDIES, SPEECH STUDIES, AND EVALUATION OF
SOUND LOCALIZATION EQUIPMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-646 934 17/2 20/1
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

SPEECH INTELLIGIBILITY OF THE BENDIX WATERCOM
SYSTEM:

(U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1,
DEC 66 7P HOLLIEN, HARRY;
CONTRACT: NONR-560(2U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON UNDERWATER SPEECH
COMMUNICATION.

DESCRIPTORS: (•VOICE COMMUNICATION SYSTEMS,
UNDERWATER), (•UNDERWATER SOUND EQUIPMENT,
•SPEECH TRANSMISSION), SPEECH, HYDROPHONES,
STANDARDIZATION, EFFICIENCY, SCUBA DIVERS, SOUND
TRANSMISSION, UNDERWATER SOUND, INTELLIGIBILITY,
SPEECH RECOGNITION

(U)

THE PILOT STUDY WAS FOCUSED ON THE EVALUATION OF A
COMMERCIAL DIVER COMMUNICATION SYSTEM AND ON THE
DEVELOPMENT OF STANDARDIZED AND PRECISE METHODS FOR
SUCH SYSTEM EVALUATION. SEVEN DIVERS, AT 30 FEET,
READ PB WORD LISTS OVER THE BENDIX WATERCOM
SYSTEM. SIXTY-ONE LISTENERS (12 DIVERS AND 49
COLLEGE STUDENTS) WERE USED TO EVALUATE SYSTEM
INTELLIGIBILITY. RESULTS ARE DISCUSSED; ALSO
INCLUDED IS A DESCRIPTION OF INFORMATION WHICH WILL
BE NEEDED BEFORE HIGHLY EFFICIENT UNDERWATER
COMMUNICATORS CAN BE DEVELOPED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-648 935 17/2 20/1 5/10
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

A DIVER COMMUNICATION RESEARCH SYSTEM (DICON). (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 2,
JAN 67 11P MOLLIER, HARRY ; THOMPSON, CARL

CONTRACT: N00R-560(20)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON UNDERWATER SPEECH
COMMUNICATION.

DESCRIPTIONS: (1) VOICE COMMUNICATION SYSTEMS,
UNDERWATER), (1) UNDERWATER SOUND EQUIPMENT,
SPEECH TRANSMISSION), SPEECH, INTELLIGIBILITY,
SCUBA DIVERS, HEARING, AUDITORY SIGNALS, VISUAL
SIGNALS, CONTROL SYSTEMS,
THRESHOLDS (PHYSIOLOGY), SPEECH RECOGNITION (U)

A SYSTEM IS DESCRIBED WHICH PROVIDES A RIGOROUSLY
CONTROLLED MILIEU WITHIN WHICH THE TESTING OF HEARING
AND SPEAKING FUNCTIONS UNDERWATER CAN BE
ACCOMPLISHED. PROVISIONS ARE MADE FOR (1) THE
PRESENTATION AND RECEPTION OF ACOUSTIC STIMULI,
(2) THE TRANSMISSION OF VISUAL MATERIAL FOR USE
EITHER AS MULTIPLE CHOICE HEARING TEST RESPONSE ITEMS
OR AS TEST MATERIAL FOR STUDIES OF SPEECH PRODUCTION
AND (3) THE TRANSMISSION OF MULTIPLE CHOICE
RESPONSES BY THE SUBJECT TO A DIGITAL (IBM) SURFACE
CONTROL UNIT. RESEARCH IS CURRENTLY IN PROGRESS
UTILIZING THIS UNIT (DICON) IN (1) THE
EVALUATION OF NORMAL HEARING THRESHOLDS FOR PURE
TONES AND SPEECH, (2) THE EVALUATION OF SPEECH
DISCRIMINATION, (3) EVALUATING DIVER'S
CAPABILITIES TO SPEAK UNDERWATER, AND (4)
EVALUATING COMMERCIAL UNDERWATER SPEECH
COMMUNICATIONS SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-650 933 5/9 14/1
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

QUANTIFICATION OF PERSONNEL PERFORMANCE FOR COST
EFFECTIVENESS DECISIONS: 1. AN ANNOTATED
BIBLIOGRAPHY.

(U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
APR 67 68P WILLIS, JOE E. IDOW, ANDREW

N. 1

REPT. NO. SRM-67-15

PROJ: PF-U16U208U1

UNCLASSIFIED REPORT

DESCRIPTORS: (*NAVAL PERSONNEL,
PERFORMANCE (HUMAN)), (*COST EFFECTIVENESS,
SYSTEMS ENGINEERING), BIBLIOGRAPHIES,
PREDICTIONS, EFFECTIVENESS, RELIABILITY,
MANPOWER

(U)

AS THE FIRST PHASE OF A PROJECT TO DEVELOP A METHOD
OF PREDICTING PERSONNEL PERFORMANCE EFFECTIVENESS, A
SEARCH OF THE LITERATURE WAS MADE. QUOTES, NOTES,
AND COMMENTS FOR THE USE OF THE RESEARCH TEAM WERE
MADE FOR EACH ARTICLE. FROM THE MATERIALS
ASSEMBLED, 115 ITEMS WERE SELECTED FOR AN ANNOTATED
BIBLIOGRAPHY COVERING FIVE AREAS: (1)
PERSONNEL PERFORMANCE EFFECTIVENESS MEASUREMENT,
(2) PERSONNEL PERFORMANCE EFFECTIVENESS
PREDICTION, (3) HUMAN RELIABILITY IN SYSTEMS,
(4) PERSONNEL PERFORMANCE DATA UTILIZATION
PROBLEMS, AND (5) FUNCTION ALLOCATION.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-651 974 5/10
YALE UNIV NEW HAVEN CONN

PROLONGED STRESS IN SEALAB II: A FIELD STUDY OF
INDIVIDUAL AND GROUP REACTIONS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
67 96P HELMHREICH, ROBERT L. ;
REPT. NO. TR-1
CONTRACT: NONR(G)-00012-66, NONR(G)-00030-66

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: DOCTORAL THESIS.

DESCRIPTORS: (*STRESS(PSYCHOLOGY),
UNDERWATER), REACTION(PSYCHOLOGY), GROUP
DYNAMICS, PERFORMANCE(HUMAN), LEADERSHIP,
SOCIOMETRICS, PSYCHOMETRICS, FEAR, SOCIAL
PSYCHOLOGY, PERSONALITY TESTS, EMOTIONS, THESES
IDENTIFIERS: SEALAB

(U)

(U)

AN INVESTIGATION WAS MADE OF INDIVIDUAL AND GROUP
REACTIONS TO EXTREME, PROLONGED STRESS IN A FIELD
SITUATION CONDUCTED AS PART OF PROJECT SEALAB
II. THE 26 DIVERS COMPLETED PERSONALITY AND
DEMOGRAPHIC QUESTIONNAIRES PRIOR TO SUBMERSION.
WHILE UNDERWATER, THEY FILLED OUT CHECKLISTS AND
WERE CONTINUOUSLY MONITORED BY CLOSED-CIRCUIT AUDIO
AND TELEVISION. DIVERS UNDERWATER WERE
SIGNIFICANTLY MORE FEARFUL AND AROUSED THAN ON THE
SURFACE PRIOR TO SUBMERSION. THE THREE 10 MEN
TEAMS WHICH LIVED TOGETHER UNDERWATER BECAME
SIGNIFICANTLY MORE COHESIVE AFTER SUBMERSION.
EVALUATION OF SOCIOMETRIC CHOICES OF LEADERS
INDICATED THAT AGE AND MATURITY WERE THE ONLY
CHARACTERISTICS ASSOCIATED WITH BEING CHOSEN AS A
LEADER. PERFORMANCE, FEAR, AROUSAL, GREGARIOUSNESS
AND CHOICE AS A PEER WERE NOT RELATED TO LEADER
CHOICE. SELF-REPORTED FEAR AND AROUSAL WERE
SIGNIFICANTLY CORRELATED WITH PERFORMANCE CRITERIA.
THE MORE FRIGHTENED AND AROUSED DIVERS DEMONSTRATED
INFERIOR PERFORMANCE. FIRST-BORN AND ONLY CHILDREN
WERE SIGNIFICANTLY MORE FRIGHTENED AND SHOWED
SIGNIFICANTLY POORER PERFORMANCE THAN LATER-BORNS.
FAILURE OF AN INDIVIDUAL TO SHARE IN GROUP
ACTIVITIES AND SOCIAL BEHAVIOR WAS ASSOCIATED WITH
HIGHER LEVELS OF REPORTED STRESS AND INFERIOR
PERFORMANCE. USING SIX PREDICTORS IN A MULTIPLE
REGRESSION, IT WAS POSSIBLE TO ACCOUNT FOR 50% OF
THE VARIANCE OF EACH OF THREE OBJECTIVE PERFORMANCE
CRITERIA. (AUTHOR)

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-651 494 6/19 5/9
OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL 45-DAY UNDERSEA SATURATION DIVE AT
205 FEET, SEALAB II PROJECT GROUP. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,
DAN 67 44P PAULI, D. C. ; CLAPPER, G.

P. 1
REPT. NO. UNR-ACH-1245

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJECT SEALAB.

DESCRIPTORS: (•BREATHING APPARATUS, •UNDERWATER
EQUIPMENT), (•OCEAN BOTTOM, •DIVING), NAVAL
RESEARCH, PHYSIOLOGY, PERFORMANCE(HUMAN),
SALVAGE, MARINE BIOLOGY, OCEANOLOGY, VISIBILITY,
DECOMPRESSION, RECOVERY, NAVAL PERSONNEL (U)

SEALAB II DEMONSTRATED THAT: THE CONCEPT OF
OCEAN-FLOOR HABITATION TO ACCOMPLISH A WIDE RANGE OF
SALVAGE AND SCIENTIFIC TASKS IS COMPATIBLE WITH MAN'S
ABILITY TO PERFORM USEFUL WORK AT THESE DEPTHS: NO
SIGNIFICANT SHORT-TIME PHYSIOLOGICAL CHANGES OCCUR
WHICH RESULTED IN DETERIORATION OF THE AQUANAUTS
PHYSICAL CONDITION: THERE IS A DEGRADATION OF
HUMAN PERFORMANCE WHICH INCREASES WITH THE COMPLEXITY
OF THE TASK BEING ACCOMPLISHED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-652 315 6/18 6/19
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL
WASHINGTON, D C COMMITTEE ON UNDERSEA WARFARE

PROCEEDINGS OF THE SYMPOSIUM ON UNDERWATER PHYSIOLOGY
(JRL), 23, 24, AND MARCH 1966, WASHINGTON, D. C.

(U)

67 518P LAMBERTSEN, C. J. :
CONTRACT: NONR-2300(U8)

UNCLASSIFIED REPORT

AVAILABILITY: AVAILABLE FROM THE WILLIAMS AND
WILKINS CO., 428 E. PRESTON ST., BALTIMORE,
MD. 21202 \$17.00.

SUPPLEMENTARY NOTE: PUB. BY THE WILLIAMS AND WILKINS
CO., BALTIMORE, MD., 1967.

DESCRIPTORS: (PHYSIOLOGY, UNDERWATER);
SYMPOSIA; DIVING; NAVAL RESEARCH; FIRES; HUMAN
ENGINEERING; DECOMPRESSION SICKNESS;
PSYCHOPHYSIOLOGY; SPEECH; HIGH-PRESSURE RESEARCH;
OXYGEN; ETIOLOGY; THERAPY; BRAIN; GAS
EMBOLISM; PERFORMANCE(HUMAN); RESPIRATION;
HYDROSTATIC PRESSURE; TOXICITY;
TOLERANCES(PHYSIOLOGY)

(U)

CONTENTS: RECENT NAVAL EXPERIENCES IN
EXTENDING USEFUL DIVING DEPTH; THE
PROBLEM OF FIRE; SATURATION DIVING;
SPECIAL PROBLEMS IN THE ETIOLOGY AND
TREATMENT OF DECOMPRESSION SICKNESS;
POTENTIAL ADVANCES IN DEEP DIVING;
LIMITATIONS OF PHYSIOLOGICAL PERFORMANCE AT
EXTREME AMBIENT PRESSURES; PHYSICAL AND
CELLULAR MECHANISMS.

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-654 374 13/10 6/16 14/2
OFFICE OF NAVAL RESEARCH WASHINGTON D C

AN EXPERIMENTAL 45-DAY UNDERSEA SATURATION DIVE AT
205 FEET. SEALAB II PROJECT GROUP, (U)

NAK 67 43UP PAULI, U. C. ICLAPPER, G.
P. :
REPT. NO. ONR-ACH-124

UNCLASSIFIED REPORT
AVAILABILITY: HARD COPY AVAILABLE FROM
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.
C. 20402 92-25.
SUPPLEMENTARY NOTE: REPT. ON PROJ. SEALAB. SEE ALSO
SUMMARY, AD-651 999.

DESCRIPTORS: (OCEAN BOTTOM, DIVING),
(LABORATORIES, UNDERWATER),
(ADAPTATION(PHYSIOLOGY), OCEAN BOTTOM),
(UNDERWATER EQUIPMENT, NAVAL RESEARCH), HUMAN
ENGINEERING, OCEANOGRAPHIC EQUIPMENT, UNDERWATER
EQUIPMENT, LIFE SUPPORT, STRESS(PHYSIOLOGY),
DECOMPRESSION, PSYCHOLOGY,
TOLERANCES(PHYSIOLOGY), SALVAGE, CONTINENTAL
SHELVES, OCEANOLOGY, NAVAL PERSONNEL (U)
IDENTIFIERS: SEALAB PROJECT (U)

THE SEALAB II OPERATION WAS CONDUCTED BETWEEN
AUG. 28 TO OCT. 14, 1965, 300 FT OFF SCRIPPS
PIER AT LA JOLLA, CALIFORNIA, IN A DEPTH OF
WATER OF 205 FT, USING A SYNTHETIC BREATHING GAS
OF HELIUM, OXYGEN, AND NITROGEN, EACH OF THE THREE
AQUANAUT TEAMS LIVED UNDER PRESSURE APPROXIMATELY 15
DAYS IN AN OCEAN-FLOOR HABITAT, MAKING FORAYS INTO
THE 40F, 5 TO 30 FT VISIBILITY BOTTOM WATERS FOR
PERIODS RANGING FROM A FEW MINUTES TO AN EXTENDED
DIVE OF 3 HOURS, EXCURSION NO-DECOMPRESSION DIVES
TO 266 FT AND 300 FT WERE ACCOMPLISHED. DIVING
FROM THE HABITAT WAS ACCOMPLISHED USING BOTH
SEMICLOSED-CIRCUIT BREATHING APPARATUS AND HOOKAH
(HABITAT-CONNECTED-HOSE) BREATHING APPARATUS.
A DECOMPRESSION COMPLEX NEW TO THE NAVY
CONSISTING OF A PERSONNEL TRANSFER CAPSULE MATING
WITH A DECK DECOMPRESSION CHAMBER WAS USED FOR
ACCOMPLISHING RECOVERY AND DECOMPRESSION OF
AQUANAUTS. SEALAB II DEMONSTRATED THAT:
(1) THE CONCEPT OF OCEAN-FLOOR HABITATION TO
ACCOMPLISH A WIDE RANGE OF SALVAGE AND SCIENTIFIC
TASKS IS COMPATIBLE WITH MAN'S ABILITY TO PERFORM
USEFUL WORK AT THESE DEPTHS. (2) NO
SIGNIFICANT SHORT-TIME PHYSIOLOGICAL CHANGES OCCUR. (U)

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UNCLASSIFIED

/ZMK23

UNCLASSIFIED

ODL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-652 405 6/17 11/10
NAVY ELECTRONICS LAB SAN DIEGO CALIF

DIVERS' BODY HEAT LOSS: DESCRIBES A STUDY OF THE
ENDURANCE OF UNDERWATER SWIMMERS WEARING A VARIETY OF
FOAM NEOPHENE WET SUITS AND IMMersed AT 30-32F IN THE
NEL ARCTIC POOL. (U)

DESCRIPTIVE NOTE: RESEARCH RLPT.,
OCT 66 39P BEAGLES, J. A. COILIE.
P. 1
REPT. NO. NEL-1408
PROJ: SR-011-01-01
TASK: 0401

UNCLASSIFIED REPORT

DESCRIPTIONS: (•UNDERWATER CLOTHING, ARCTIC
REGIONS), (•SYNTHETIC RUBBER, UNDERWATER
CLOTHING), DESIGN, SOCKS, GLOVES, BODY
TEMPERATURE, EXPOSURE, EFFECTIVENESS, SCUBA DIVERS (U)

A STUDY WAS MADE PRIMARILY TO OBTAIN DATA
APPLICABLE TO THE DESIGN OF AN OPTIMUM PROTECTIVE
SUIT FOR DIVERS IN ARCTIC ENVIRONMENTS. THE
EXPERIMENTAL METHOD EMPLOYED SWIMMERS WHO PERFORMED
SHALLOW DIVES IN THE NEL ARCTIC POOL AT 30-32F.
SKIN TEMPERATURE WAS RECORDED BY THE USE OF
SUITABLY LOCATED THERMISTORS, AND OTHER DATA WERE
OBTAINED FROM BLOOD SAMPLES DRAWN IMMEDIATELY BEFORE
AND AFTER EACH DIVE. RESULTS SUGGEST THAT A FOUR-
PIECE FOAM NEOPHENE WET SUIT CONSISTING OF A 1/8-INCH
TIGHT-FITTING INNER SUIT AND A 1/4-INCH SNUG-FITTING
OUTER SUIT ALONG WITH TWO PAIRS OF NEOPRENE SOCKS AND
MITTENS WOULD PROVIDE THE OPTIMUM COMBINATION OF
PROTECTION AND MOBILITY FOR DIVERS IN ARCTIC WATERS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-653 755 6/19
DUNLAP AND ASSOCIATES INC DARIEN CONN

STUDIES OF THE PERFORMANCE CAPABILITIES OF DIVERS:
THE EFFECTS OF COLD. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 67 59P BOWEN, HUGH M. ; PEPLER,
RICHARD D. ;
REPT. NO. SS067-399
CONTRACT: N00014-67-C-0263, NONR-4986(UO)
PROJ: NR-196-065

UNCLASSIFIED REPORT

DESCRIPTORS: (*DIVING, STRESS(PHYSIOLOGY)),
PERFORMANCE(HUMAN), TOUCH, SENSITIVITY,
MOTION, REASONING, PROBLEM SOLVING, MEMORY,
ATTENTION, MOTOR REACTIONS, UNDERWATER (U)
IDENTIFIERS: COLD TOLERANCE (U)

THE STUDY EXAMINES THE PERFORMANCE CAPABILITIES OF DIVERS. TRIALS WERE CONDUCTED AT VARIOUS WATER TEMPERATURES TO ASSESS THE EFFECTS OF COLD. DRY LAND TRIALS PROVIDED CONTROL PERFORMANCE SCORES. THE CAPABILITIES TESTED WERE: TACTILE SENSITIVITY, MANUAL DEXTERITY, MANUAL MOVEMENT, REASONING(ARITHMETIC), PROBLEM SOLVING, MEMORY, AND A MULTI-TASK CAPABILITY REQUIRING SIMULTANEOUS MANUAL TRACKING AND ATTENTION TO AN AUDIO CHANNEL. THE DATA INDICATES THAT DIVING IN WARM WATER CAUSES LOSS IN MOTOR FUNCTIONS DUE, IT IS THOUGHT, TO THE CHANGES AND HINDRANCES EXPERIENCED IN THE DIVING CONDITION. DIVING IN COLD WATER INCREASES THE MOTOR LOSS AND CAUSES DISTRACTION AND DISRUPTION IN MENTAL TASKS; 'BLUCKING' IN ATTENTION AND LOWERED MEMORY CAPABILITY WERE FOUND. IMPAIRMENT OF PERFORMANCE ON THE MULTI-TASK WAS CONSIDERABLE. IT IS HYPOTHEZIZED THAT COLD WATER STRESS, IN ADDITION TO CAUSING SPECIFIC SENSORY AND MOTOR LOSSES, CAUSES INCREASING LOSSES OF CAPABILITY AS THE TASK BECOMES MORE COMPLEX AND IS MORE DEPENDENT ON SUSTAINED ATTENTION AND MEMORY FUNCTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-656 634 5/9
DUNLAP AND ASSOCIATES INC STAMFORD CONN

TRAINING AND SUPERVISION OF CONTROLLERMAN. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 50 19P CHANNELL, RALPH C. ;
CONTRACT: N80NH-641(U2)
PROJ: NR-784-002, SPECDEVLEN-20-F-2
MONITOR: SPECDEVLEN 641-2-7

UNCLASSIFIED REPORT

DESCRIPTORS: (SUBMARINE PERSONNEL, NAVAL
TRAINING), (SUPERVISION, SUBMARINE PERSONNEL),
CONTROL, HUMAN ENGINEERING, SUBMARINES, MARINE
PROPULSION, PERFORMANCE (HUMAN), INSTRUCTION
MANUALS (U)

THE REPORT IS CONCERNED WITH THE PROBLEM OF
IMPROVING CONTROLLERMAN PERFORMANCE. THE
RECOMMENDATIONS ARE DIVIDED INTO TWO SECTIONS:
INITIAL INDOCTRINATION OF THE CONTROLLERMAN,
LARGELY AT THE SUBMARINE SCHOOL, AND THE
SUBSEQUENT SUPERVISION DURING SERVICE AT SEA. IT
IS RECOMMENDED THAT THE NEWLY TRAINED CONTROLLERMAN
BE CAREFULLY GUIDED AND SUPERVISED DURING HIS INITIAL
TOUR OF SEA DUTY WITH AN EMPHASIS UPON CORRECT HAND
ALLOCATION, PROPER SEQUENCE OF CONTROLLER
MANIPULATION, AND PROMPT, POSITIVE ACTION. IT IS
ALSO RECOMMENDED THAT THE DIALS OF RELATED
INSTRUMENTS AND CONTROLLERS ABOARD ALL SUBMARINES BE
IDENTIFIED WITH COLORED BORDERS SIMILAR TO THOSE
RECOMMENDED FOR THE PROPULSION CUBICLE AT THE
SUBMARINE SCHOOL. IN ORDER TO PROVIDE ADDED
INCENTIVE FOR CONTINUED PRACTICE AND IMPROVEMENT, IT
IS RECOMMENDED THAT EXPERT CONTROLLERMAN BE GIVEN A
SPECIAL 'CONTROLLER QUALIFICATION' ENTRY IN THEIR
SERVICE RECORD UPON PASSING A PRACTICAL EXAMINATION.
THE ESSENTIAL NATURE OF THIS EXAMINATION SHOULD
CONFORM TO THE TESTS USED AT THE SUBMARINE
SCHOOL, AND SHOULD INCLUDE THE FOLLOWING
CRITERIA: ACCURACY OF PERFORMANCE, PROPER HAND
ALLOCATION TO LEVERS, CORRECT SEQUENCE OF MOVEMENTS,
AND STANDARD TIMES FOR VARIOUS PROBLEMS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-656 674 6/19 6/5
MEDICAL COLL OF VIRGINIA RICHMOND DEPT OF PSYCHIATRY

A BIBLIOGRAPHICAL SOURCEBOOK OF COMPRESSED AIR,
DIVING AND SUBMARINE MEDICINE, VOLUME III, (U)

DEC 66 J15P HOFF,EBBE CURTIS I GREENBAUM,
LEON JACK, JR
CONTRACT: NONR-1134(04)
PROJ: NR-102-527

UNCLASSIFIED REPORT

AVAILABILITY: HARD COPY AVAILABLE FROM
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.
C., 20402 \$3.25.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH NAVAL
MEDICAL RESEARCH INST., BETHESDA, MD.

DESCRIPTORS: (*STRESS(PHYSIOLOGY),
UNDERWATER), MILITARY MEDICINE, COMPRESSED AIR,
DIVING, SUBMARINE PERSONNEL, DECOMPRESSION
SICKNESS, OXYGEN, CARBON DIOXIDE, HELIUM GROUP
GASES, ACCLIMATIZATION, VISION, HEARING,
HYDROSTATIC PRESSURE, TOXICITY, PATHOLOGY,
CARBON MONOXIDE, POISONING, MOTION SICKNESS,
SUBMARINE ESCAPE, VENTILATION, AIR POLLUTION,
SELECTION, HUMAN ENGINEERING, SLEEP,
PERFORMANCE(HUMAN), SCUBA DIVERS, HAZARDS,
DISEASES, ACCIDENTS, TRAINING, PSYCHIATRY (U)

CONTENTS: TECHNICAL PROCEDURES AND RESEARCH
APPARATUS IN COMPRESSED AIR, DIVING AND SUBMARINE
MEDICINE; SPECIAL ANATOMY, PHYSIOLOGY AND
BIOCHEMISTRY OF COMPRESSED AIR, DIVING AND SUBMARINE
MEDICINE; BIOLOGY OF VERY HIGH HYDROSTATIC
PRESSURES; DISEASES AND ACCIDENTS IN SUBMARINE
PERSONNEL, DIVERS, AND COMPRESSED AIR WORKERS;
PROTECTION AND PRESERVATION OF PERSONNEL;
SELECTION AND TRAINING OF SUBMARINE PERSONNEL,
DIVERS AND COMPRESSED AIR WORKERS; SPECIAL
PSYCHOLOGICAL AND PSYCHIATRIC PROBLEMS; SPECIAL
PROBLEMS OF SCUBA DIVING. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-658 691 17/3 5/10 5/8
JOHNS HOPKINS UNIV BALTIMORE MD

SPECIAL PROBLEMS IN THE ESTIMATION OF BEARING. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
JAN 48 49P REESE, T. W.; VOLKMAN, J. J.
ROGERS, S.; KAUFMAN, E. L.;
CONTRACT: NSORI-166(U1)
MONITOR: SPECDEVLEN MH-166-1-MHC-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH MT.
HOLYOKE COLL., SOUTH HADLEY, MASS., DEPT. OF
PSYCHOLOGY AND EDUCATION.

DESCRIPTIONS: (1) DIRECTION FINDING,
PERFORMANCE (HUMAN); ACCURACY, DECISION
MAKING, DISPLAY SYSTEMS, TARGETS, NAVAL
PERSONNEL (U)

THE SUBJECTS WERE ASKED THE FOLLOWING SPECIAL
QUESTIONS: (1) WHAT EFFECT HAS THE LENGTH OF
THE LINE OF LIGHT WHOSE BEARING IS TO BE JUDGED ON
THE ACCURACY AND VARIABILITY OF THE SUBJECT'S
JUDGMENTS. (THE LINE WHOSE BEARING IS TO BE JUDGED
IS REFERRED TO AS THE BEARING INDICATOR). (2)
WHAT HAPPENS TO ACCURACY AND VARIABILITY WHEN ONLY
THE OUTER TIP OF THE BEARING INDICATOR IS SHOWN.
(3) WHAT IS THE SIZE OF THE INDIVIDUAL
DIFFERENCES IN BOTH ACCURACY AND VARIABILITY, AND IS
THERE ANY RELATION BETWEEN ACCURACY AND VARIABILITY,
THAT IS, DO THE MOST ACCURATE SUBJECTS TEND TO BE THE
LEAST VARIABLE. THE ANSWERS TO THESE QUESTIONS
ARE: FIRST, CHANGING THE LENGTH OF THE BEARING
INDICATOR OVER A WIDE RANGE (FROM 93% OF THE
RADIUS OF THE DISPLAY SCREEN TO ONLY 6.6% OF THE
RADIUS) HAD LITTLE EFFECT ON EITHER THE ACCURACY OR
THE VARIABILITY OF THE SUBJECTS' ESTIMATES.
SECONDLY, THE OUTER TIP SEEMS TO BE THE MOST
EFFECTIVE PORTION OF THE BEARING MARKER IN MAKING
ACCURATE JUDGMENTS OF BEARING. IN FACT, UNDER THE
CONDITIONS OF THIS EXPERIMENT, ACCURACY IS INCREASED
AND VARIABILITY REDUCED WHEN ONLY THIS PORTION OF THE
MARKER IS SHOWN. THIRDLY, THE MOST ACCURATE
SUBJECT WAS ABOUT THREE TIMES MORE ACCURATE THAN THE
LEAST ACCURATE SUBJECT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-660 003 5/9 5/8
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

FEASIBILITY OF THE DEVELOPMENT AND UTILIZATION OF
PERSONNEL PERFORMANCE EFFECTIVENESS MEASURES FOR MAN/
MACHINE FUNCTION ALLOCATION DECISIONS. (U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
UCT 67 27P WILLIS, JOE E. ;
REPT. NO. NPRA-SRM-68-7
TASK: PF-0160201H04

UNCLASSIFIED REPORT

DESCRIPTORS: (MAN-MACHINE SYSTEMS,
PERFORMANCE(HUMAN)), PERSONNEL MANAGEMENT,
DECISION MAKING, EFFECTIVENESS, SYSTEMS
ENGINEERING, NAVAL PERSONNEL (U)

THE REPORT SUMMARIZES RESEARCH UNDERTAKEN TO
EXAMINE THE FEASIBILITY OF DEVELOPING A METHODOLOGY
FOR PROVIDING QUANTITATIVE INDICES OF PERSONNEL
PERFORMANCE EFFECTIVENESS (PPE), FOR USE IN
MAN/MACHINE FUNCTION ALLOCATION DECISIONS. SUCH
PPE INDICES WOULD ALSO PROVIDE A PERSONNEL INPUT TO
THE GENERAL SYSTEMS EFFECTIVENESS MODEL. AFTER
REVIEWING SOME OF THE MOST SIGNIFICANT WORK WHICH HAS
BEEN DONE BY OTHERS IN THE PPE AREA, THE GENERAL
APPROACH TO BE TAKEN IN DEVELOPING A NAVY PPE
SYSTEM IS DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-660 271 6/16
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE
MEDICAL RESEARCH LAB

VISION UNDERWATER.

(U)

DEC 65 10P KENT, PAUL H. ;
REPT. NO. SMML-498
MONITOR: NAVMED MF011.99.9002-4

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN AMERICAN JOURNAL OF
OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF
OPTOMETRY V43 N4 P553-65 SEP 1966.

SUPPLEMENTARY NOTE: PRESENTED AT THE ANNUAL MEETING OF
THE AMERICAN ACADEMY OF OPTOMETRY, CHICAGO, ILL.,
13 DEC 65.

DESCRIPTORS: (VISION, UNDERWATER),
ADAPTATION(PHYSIOLOGY), SCUBA DIVERS,
VISIBILITY, TARGET DISCRIMINATION, FLUORESCENCE,
VISUAL ACUITY, SPACE PERCEPTION, PAINTS

(U)

VISUAL RESOLUTION OF LANDOLT RING TARGETS IN
CLEAR WATER AT SHORT RANGE WAS FOUND TO BE BETTER
THAN IN AIR AT THE SAME PHYSICAL DISTANCE, WHEN
TARGET LUMINANCES WERE EQUATED FOR THE TWO
CONDITIONS, BUT FELL BELOW PREDICTIONS BASED UPON THE
MAGNIFICATION OF UNDERWATER TARGETS. THIS IS
ASCRIBED TO A GREATER LENS FOGGING PROBLEM UNDERWATER
AND THE LACK OF SUFFICIENTLY SMALL TARGETS FOR SOME
OBSERVERS. BOTH SIZE AND DISTANCE WERE
OVERESTIMATED UNDERWATER, EXCEPT FOR SHORT RANGES.
FLUORESCENT PAINTS WERE FOUND TO BE MORE VISIBLE
UNDERWATER THAN NON-FLUORESCENT TYPES.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-662 221 13/10 13/9 13/8
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

UNDERWATER TOOLS, EQUIPMENT, AND WORK TECHNIQUES: A
SURVEY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 67 55P TEAGUE, DONALD S. , JR.:
HALLANGER, LAWRENCE W. :
REPT. NO. NCEL-TR-548
PROJ: 2-FU15-01-99-001

UNCLASSIFIED REPORT

DESCRIPTORS: (SMALL TOOLS, UNDERWATER EQUIPMENT),
STATE-OF-THE-ART REVIEWS, UNDERWATER CLOTHING,
PNEUMATIC DEVICES, HYDRAULIC SYSTEMS, CUTTING
TOOLS, DRILLING, JOINING, UNDERWATER COMMUNICATION
SYSTEMS, UNDERWATER PHOTOGRAPHY, HOISTS, EXPLOSIVE
ACTUATORS (U)

THE REPORT REVIEWS PUBLISHED AND UNPUBLISHED
INFORMATION ON UNDERWATER EQUIPMENT (TOOLS,
COMMUNICATIONS SYSTEMS, PHOTOGRAPHIC PARAPHERNALIA,
AND DIVING GEAR) AND WORKING TECHNIQUES THAT CAN BE
USED BY ONE OR TWO DIVERS AT NORMAL DIVING DEPTHS.
UNDERWATER WORK TECHNIQUES (SUCH AS HAMMERING,
SAWING, AND DRILLING) AND THE METHODS AND TOOLS
USED TO PERFORM THEM ARE DISCUSSED. SPECIFIC
IMPROVEMENTS NEEDED IN EQUIPMENT AND TECHNIQUES ARE
LISTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 540 6/14
NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN

REPORT ON THE STANDARDIZATION OF NIGHT LOOKOUT
STAGES.

(U)

DESCRIPTIVE NOTE: REPT. NO. 1 ON PROJECT.
MAY 45 YP VERPLANCK, W. S. ;
REPT. NO. NMRL-61
PROJ: NAVMED-X-350

UNCLASSIFIED REPORT

DESCRIPTORS: (NIGHT VISION, PERFORMANCE TESTS),
STANDARDIZATION, NAVAL PERSONNEL,
PERFORMANCE(HUMAN), TEST EQUIPMENT
IDENTIFIERS: LOOKOUTS(PERSONNEL)

(U)

(U)

THE MEDICAL RESEARCH DEPARTMENT, U.S.
SUBMARINE BASE, RECEIVED REPORTS OF THE RESULTS
OF NIGHT LOOKOUT TRAINING FROM 40 ACTIVITIES
THROUGHOUT THE NAVY. THESE REPORTS INCLUDED DATA
ON MORE THAN 500,000 MEN TRAINED FOLLOWING A STANDARD
PROCEDURE. EACH REPORT WAS ANALYZED WITH RESPECT
TO THE PERCENTAGE OF MEN SIGHTING THE TARGET AT EACH
BRIGHTNESS LEVEL AND AT THE CORRESPONDING VOLTMETER
SETTING, AND MEDIAN VALUES FOR ALL REPORTING
ACTIVITIES WERE DERIVED. WITH THESE DATA USED AS A
BASIS, EACH ACTIVITY WAS ADVISED AS TO THE PROPER
VOLTMETER SETTINGS TO EMPLOY, SO THAT THE TRAINING AT
THE GREAT MAJORITY OF REPORTING ACTIVITIES HAS BEEN
RENDERED RELATIVELY UNIFORM. (AUTHOR)

(U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 619 5/5 13/10.1
NAVAL SUBMARINE BASE NEW LONDON CONN

SURVEY OF SOUND PRESSURE LEVEL OF U.S.S.
NAUTILUS.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
FEB 56 12P HARRIS, J. DONALD ;
REPT. NO. SBNL-MEMO-56-4
PROJ: NAVMED-NM-003-U41.56
TASK: NM-003-U41.56-08

UNCLASSIFIED REPORT

DESCRIPTORS: (•SUBMARINE NOISE,
STRESS(PHYSIOLOGY)), SUBMARINE PERSONNEL,
SPEECH, HEARING, INTELLIGIBILITY, HUMAN
ENGINEERING

(U)

IDENTIFIERS: HABITABILITY

(U)

STUDIES WERE CONDUCTED TO ASCERTAIN WHETHER THE
NOISE LEVEL OF A NEW TYPE SUBMARINE WOULD BE
INCOMPATIBLE WITH PERSONNEL HABITABILITY, INTERFERE
WITH SPEECH COMMUNICATION OR CAUSE AUDITORY DAMAGE.
WHILE CERTAIN SPACES WITHIN THE SHIP WERE
CLASSIFIED AS 'VERY NOISY', STILL THE NOISE LEVEL WAS
NOT SUFFICIENT TO CAUSE AUDITORY DAMAGE. THE NOISE
LEVELS FOUND WERE CONSIDERABLY BELOW SAFETY LIMITS
SET BY ANY NATIONALLY KNOWN GROUP. IN ENGINE ROOM
WORKSPACES, THE SPEECH INTERFERENCE LEVEL WAS ALWAYS
LOW ENOUGH TO RENDER SPEECH INTELLIGIBLE OVER A
DISTANCE OF A COUPLE OF FEET. IN OTHER WORKSPACES,
NOISES WERE NOT INTENSE ENOUGH TO DETERIORATE SPEECH
BEYOND REASONABLE LIMITS TO REDUCE HABITABILITY IN
GENERAL. THERE IS NO INDICATION THAT SERVICE
ABOARD VESSELS OF THIS TYPE WOULD CAUSE DAMAGE TO
HEARING, OR BE UNDULY UNCOMFORTABLE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-663 625 5/5 13/10.1
NAVAL SUBMARINE BASE NEW LONDON CONN

THE HABITABILITY PROGRAM FOR SUBMARINES, AIRSHIPS AND
CERTAIN OTHER LONG DURATION MILITARY TASK UNITS;
PRINCIPLES OF ANALYSIS. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
JUN 57 OF FARNSWORTH, DEAN ;
REPT. NO. SBNL-MEMO-57-2
PROJ: NAVMED-22-U2-2U

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON THE ANNUAL NUCLEAR
SCIENCES SEMINAR (5TH), BROOKHAVEN NATIONAL
LABORATORY.

DESCRIPTORS: (HUMAN ENGINEERING, SUBMARINES),
SUBMARINE PERSONNEL, EFFICIENCY, MURALS, COLORS,
DESIGN, LIGHTING EQUIPMENT, RECREATION (U)
IDENTIFIERS: HABITABILITY (U)

THE PURPOSE OF HABITABILITY PROGRAMS IS, IN
GENERAL, TO INCREASE THE EFFICIENCY OF THE PERSONNEL.
SPECIFICALLY: (1) TO INCREASE THE GENERAL
PHYSICAL AND MENTAL WELL-BEING OF THE PERSONNEL BY
PROVIDING PHYSICAL ARRANGEMENTS WHICH ENABLE THEM TO
SLEEP RESTFULLY, EAT WITH SATISFACTION, WORK WITH
CONFIDENCE AND RELAX WITH EASE. (2) TO PROMOTE
A STATE OF MIND WHICH CAUSES THE PERSONNEL TO
ANTICIPATE A RETURN TO CRUISE DUTY WITH AGREEABLENESS
OR WITH PLEASURE. (3) TO MINIMIZE, AS FAR AS
CONSISTENT WITH OPERATIONAL EFFICIENCY, DECIDED
DIFFERENCES BETWEEN THE HABITS AND CUSTOMS
ESTABLISHED BY FIFTEEN TO TWENTY YEARS OF AMERICAN
HOME LIFE AND THE LIVING CONDITIONS ABOARD A SHIP.
(4) TO INCREASE THE SATISFACTION OF EACH
INDIVIDUAL WITH HIS OWN WORK AND STIMULATE PRIDE IN
HIS PARTICULAR SHIP. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 634 6/17 6/7
NAVAL SUBMARINE BASE NEW LONDON CONN

EVALUATION FOR SERVICE USE OF A PROTO-TYPE SWIMMER'S
RESCUE SUIT. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
MAK 58 IJP KENTSCH, SAMUEL B. , JR;
REPT. NO. SBNL-MEMO-58-1
PROJ: NAVMED-NM-21-01-20.01
TASK: NM-21-01-20.01-01

UNCLASSIFIED REPORT

DESCRIPTORS: (SEA RESCUES, UNDERWATER CLOTHING),
(UNDERWATER CLOTHING,
PERFORMANCE(ENGINEERING)), SWIMMING, DIVING,
EFFECTIVENESS, BREATHING APPARATUS,
MOISTUREPROOFING, BUOYANCY, THERMAL INSULATION,
ELASTICITY, ACCEPTABILITY (U)

THE INVESTIGATION WAS ONE OF A SERIES OF TESTS AND
EVALUATIONS OF PROTOTYPE RESCUE (SWIM) SUITS
CONDUCTED BY NAMRL IN COOPERATION WITH THE
RESEARCH SECTION OF THE NAVAL CLOTHING
SUPPLY OFFICE, BROOKLYN. THE SUIT WAS TRIED
OUT UNDER SERVICE OPERATING CONDITIONS DURING
EXERCISES ABOARD TWO SUBMARINE RESCUE AND SALVAGE
VESSELS (ASH'S 15 AND 16) DURING JUNE AND
JULY 1957 AND JANUARY 1958. THE SCOPE OF THE
EVALUATIONS INCLUDED SWIMMING, SURFACE DIVING,
FLOATING, SIMULATED RESCUING OF PERSONNEL, AND USE
WITH AN AQUA LUNG FOR SUCH PURPOSES AS EXAMINING THE
BOTTOM OF SHIPS, CHECKING ANCHOR CHAINS FOR FOULING,
AND FOR TAKING UNDERWATER PICTURES. A NUMBER OF
FAVORABLE FEATURES WERE NOTED--WATERPROOFNESS,
BUOYANCY, WARMTH, AND A NUMBER OF UNFAVORABLE
FEATURES WERE TABULATED FOR USE IN MODIFICATION OF
THESE SUITS, SUCH AS POOR LOCATIONS OF THE FLUTTER
VALVE AND THE CHIN SEGMENT OF THE FACE OPENING. IT
WAS DIFFICULT TO GET INTO THE SUIT AND TOOK TOO LONG
A TIME, AND THE MATERIAL WAS SO LIMITED IN ELASTICITY
AS TO CAUSE DISCOMFORT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-663 057 13/1 13/10.1 5/5
NAVAL SUBMARINE BASE NEW LONDON CONN

A PHOTOMETRIC SURVEY OF THE RED LIGHTING INSTALLATION
ON THE SUBMARINE U.S.S. CAVALLA (SS-244), CONVERTED
TO K-2. (U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.

SEP 53 6P

REPT. NO. SBNL-MEMO-53-12

PROJ: NAVMED-NM-002-U14-U1

UNCLASSIFIED REPORT

DESCRIPTORS: (•LIGHTING EQUIPMENT, SUBMARINES),
ILLUMINATION, HUMAN ENGINEERING, CALIBRATION,
SPECIFICATIONS (U)

IDENTIFIERS: SS 244 (U)

THE PHOTOMETRIC SURVEY OF THE RED ILLUMINATION IN
THE SS-244 WAS CONDUCTED ON THE NIGHT OF 28-29
AUGUST 1953. READINGS WERE MADE WITH A MACBETH
ILLUMINUMETER AND CALIBRATED ACCESSORY DEVICES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-66J 694 13/10 5/2
BUREAU OF SHIPS WASHINGTON D C

DIVING MANUAL.

(U)

JUL 52 167P
REPT. NO. NAVSHIPS-250-880

UNCLASSIFIED REPORT

DESCRIPTORS: (•DIVING, HANDBOOKS), PHYSIOLOGY,
PHYSICS, CONFINED ENVIRONMENTS, NAVAL EQUIPMENT,
NAVAL RESEARCH, DECOMPRESSION SICKNESS,
DECOMPRESSION, HELIUM, TABLES, COMPRESSED AIR,
UNDERWATER EQUIPMENT, UNDERWATER CLOTHING,
UNDERWATER VEHICLES, OCEANOGRAPHIC EQUIPMENT,
INSTRUCTION MANUALS

(U)

IDENTIFIERS: MANNED SUBMERSIBLES

(U)

THE MANUAL SUPERSEDES THE 1943 EDITION OF THE
DIVING MANUAL, AND SUPPLEMENTS THE INSTRUCTIONS
GIVEN IN BUREAU OF SHIPS MANUAL, CHAPTER 94,
SALVAGE; SECTION II, DIVING. IT CONTAINS
INFORMATION IN REGARD TO THE PHYSIOLOGICAL ASPECTS OF
DIVING WHICH ARE NOT INCLUDED IN CHAPTER 94 OF THE
BUREAU OF SHIPS MANUAL. THE ADDITIONAL
INSTRUCTIONS ARE GIVEN IN THE MANUAL FOR THE
PURPOSE OF TRAINING PERSONNEL.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-664 645 13/10.1 5/5 13/1
NAVAL SUBMARINE BASE NEW LONDON CONN

PHOTOMETRIC SURVEY OF THE RED LIGHTING INSTALLATION
ON THE USS SWORDFISH (SSN579). (U)

DESCRIPTIVE NOTE: MEMO. REPT.

UCI 50 IJP

REPT. NO. 58HL-MEMO-58-12

PROJ: NAVMED-NM-22-04-20.01

TASK: NM-22-U2-20.01-03

UNCLASSIFIED REPORT

DESCRIPTORS: (•LIGHTING EQUIPMENT, •SUBMARINES),
NUCLEAR POWERED VESSELS, SUBMARINE PERSONNEL,
VISION, ADAPTATION(PHYSIOLOGY), ILLUMINATION,
MILITARY REQUIREMENTS, HUMAN ENGINEERING,
LEAKAGE(ELECTRICAL), PHOTOMETERS (U)
IDENTIFIERS: SSN 579, RED LIGHTS (U)

THE RED LIGHTING INSTALLATION OF THE U.S.S.
SWORDFISH WAS SURVEYED WITH A VIEW TO DETERMINING
THE ADEQUACY OF THE INSTALLATION TO PROVIDE FOR
SUBSEQUENT DARK ADAPTATION OF THE CREW. IN
GENERAL, ILLUMINATION WAS EVENLY DISTRIBUTED AND
ADEQUATE FOR NORMAL OPERATIONS. THE GENERAL LEVEL
OF ILLUMINATION WAS CONSIDERED TO BE SOMEWHAT TOO
HIGH. SPECIFIC DISCREPANCIES ARE NOTED, THE MOST
CONSTANT ONE BEING THE TENDENCY FOR THE JF330
LIGHTING FIXTURES TO LEAK WHITE LIGHT AT BOTH ENDS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

ADP665 000 8/1

SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA CALIF

ECOLOGICAL STUDIES DURING PROJECT SEALAB II, (U)

FEB 66 IIP CLARKE, THOMAS A. FLECHSIG,

ARTHUR O. BRIGGS, RICHARD W. :

CONTRACT: NONR-2216(J3)

PROJ: NR-063-005

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN SCIENCE, V157 N3795

P1381-9 SEP 22 1967.

DESCRIPTORS: (MARINE BIOLOGY, ECOLOGY),
(UNDERWATER VEHICLES, ECOLOGY), UNDERWATER
EQUIPMENT, ENVIRONMENTAL TESTS, LABORATORIES,
PLANKTON, OCEAN BOTTOM SAMPLING, NUTRITION,
PERFORMANCE (HUMAN), INVERTEBRATES, AQUATIC
ANIMALS, DISTRIBUTION, PERIODIC VARIATIONS, DEEP
SUBMERGENCE (U)

IDENTIFIERS: SEALAB 2, MANNED SUBMERSIBLES (U)

THE MAIN PURPOSE OF THE PROJECT WAS TO EVALUATE THE
PERFORMANCE OF MEN AND EQUIPMENT IN A HIGH-PRESSURE,
UNDERWATER ENVIRONMENT (1). SEALAB II, AN
UNDERWATER HABITAT, WAS PLACED ON THE BOTTOM FOR 45
DAYS. DURING THIS TIME STUDIES WERE MADE OF THE
ECOLOGY OF THE SAND BOTTOM AROUND THE SITE AND
OBSERVED ON A DAY-BY-DAY BASIS THE ORGANISMS
ATTRACTED TO THE SITE AS WELL AS ABUNDANCES,
BEHAVIOR, AND FOOD HABITS. MOST OF OUR
OBSERVATIONS WERE OF AREAS ADJACENT TO SEALAB II.
(AUTHOR) (U)

UNCLASSIFIED

UCL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AUT668 180 15/7 5/10
CALIFORNIA UNIV LOS ANGELES BIOTECHNOLOGY LAB

UNDERWATER WORK MEASUREMENT TECHNIQUES: INITIAL STUDIES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NAW 60 105P ELTHAN, GERSHON; EGSTROM,
GLEN H. ILLIOTT, ROBERT E. STEVENSON, HERBERT
S. ;
REPT. NO. TR-44, 68-11
CONTRACT: N00014-67-A-0111
PROJ: NK-196-369

UNCLASSIFIED REPORT

DESCRIPTORS: (PERFORMANCE(HUMAN),
UNDERWATER), (DIVING, PERFORMANCE(HUMAN)),
BIOMETRY, DATA PROCESSING SYSTEMS, EFFECTIVENESS,
CONSTRUCTION. MODELS(SIMULATIONS), RESEARCH
PROGRAM ADMINISTRATION, TEST METHODS,
CLASSIFICATION, CLOSED CIRCUIT TELEVISION,
RECORDING SYSTEMS, ARMS, LEGS,
STRESS(PHYSIOLOGY), RESPIRATION,
ELECTROCARDIOGRAPHY, SPACE ENVIRONMENTAL CONDITIONS,
STRESS(PSYCHOLOGY), OCEAN BOTTOM, TABLES (U)
IDENTIFIERS: WORK MEASUREMENT(UNDERWATER),
GRAPHS(CHARTS) (U)

THE REPORT REVIEWS INITIAL PROGRESS IN AN ONGOING STUDY OF UNDERWATER WORK MEASUREMENT. THE OBJECTIVE OF THE STUDY IS TO DETERMINE NEW WAYS OF DEFINING AND MEASURING DIVER WORK EFFECTIVENESS, AND TO DEVELOP MEASUREMENT TECHNIQUES FOR GENERAL APPLICATION IN RESEARCH AND OPERATIONAL PROGRAMS. EXAMINATION OF MEASUREMENT TECHNIQUES WAS DIVIDED INTO THREE MAIN AREAS: PROCEDURAL, PHYSIOLOGICAL AND PSYCHOLOGICAL. THE REPORT DESCRIBES THE DEVELOPMENT OF A PIPE CONSTRUCTION TASK AND A LABORATORY DIOINSTRUMENTATION SYSTEM. IN ADDITION, IT PRESENTS THE RESULTS OF A SERIES OF SUB-STUDIES DEALING WITH WORK METHODOLOGY AND PHYSIOLOGICAL RESPONSE UNDERWATER. THE STUDIES WERE CONDUCTED IN THE DIVING TANK OF THE UCLA UNDERWATER RESEARCH FACILITY. A SUMMARY OF FINDINGS AND RECOMMENDATIONS IS INCLUDED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-669 512 5/10 13/10 6/14
NORTH AMERICAN ROCKWELL CORP DOWNNEY CALIF SPACE DIV

STUDY OF WORK-PRODUCING CHARACTERISTICS OF UNDERWATER
OPERATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 MAY 67-14 MAY 68,
MAY 68 39P STREIMER, I. ; TURNER, U. P.

W. ; VOLAMER, A. ;

REPT. NO. SD-68-347

CONTRACT: N00014-67-C-0363

TASK: NK-196-070

UNCLASSIFIED REPORT

DESCRIPTIONS: (SCUBA DIVERS, PERFORMANCE TESTS),
UNDERWATER, ENVIRONMENTAL TESTS, MARINE
ENGINEERING, PERFORMANCE (HUMAN), CORRELATION
TECHNIQUES, TERRAIN, BIOLOGY, TEST METHODS,
SEQUENCES, SENSORS, ELECTROCARDIOGRAPHY, SKIN,
TEMPERATURE, THERMISTORS, ANTHROPOMETRY,
TABLES (U)

THE WORK OUTPUT CHARACTERISTICS OF DIVERS WERE
TESTED DURING THE PERFORMANCE OF MANUAL TASKS WHICH
GENERALLY FELL INTO THREE CLASSIFICATIONS: (1)
A COMPLEX MAINTENANCE TASK INVOLVING THE
DISASSEMBLY AND REASSEMBLY OF A WATER FILTRATION
UNIT. (2) A SIMPLE REPETITIVE ROTARY TASK
REQUIRING CONTINUOUS TORQUE PRODUCTION AGAINST KNOWN
RESISTANCES. (3) A SIMPLE REPETITIVE
DISCONTINUOUS FLEXION/EXTENSION TASK REQUIRING THE
EXERTION OF LINEAR FORCES AGAINST KNOWN RESISTANCES.
DURING THE TASK EXECUTION, HEART RATE AND THREE
SKIN TEMPERATURES WERE CONTINUOUSLY MONITORED AND
ELECTRONICALLY RECORDED. THE UNDERWATER RESULTS
WERE COMPARED WITH PERFORMANCE VALUES OBTAINED FROM
THESE TASKS EXECUTED IN NORMALLY TRACTIVE 'DRY'
ENVIRONMENTS AND THE OBSERVED DECREMENTS DISCUSSED IN
TERMS OF BIOMECHANICAL CONSIDERATIONS AND CERTAIN
WATER EFFECTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-670 001 6/14
DUNLAP AND ASSOCIATES INC DARIEN CONN

DIVER PERFORMANCE AND THE EFFECTS OF COLD. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.:
DEC 67 46P BOWEN, HUGH M. ;
REPT. NO. 65067-741
CONTRACT: N00014-67-C-0263

UNCLASSIFIED REPORT

DESCRIPTIONS: (DIVING, STRESS(PHYSIOLOGY)),
PERFORMANCE(HUMAN), COLD WEATHER TESTS, BODY
TEMPERATURE, TOLERANCES(PHYSIOLOGY), PERFORMANCE
TESTS, TOUCH, STRENGTH, REASONING, PROBLEM
SOLVING, MEMORY, PSYCHOMOTOR TESTS, SCUBA DIVERS (U)

THE CAPABILITY OF DIVERS WAS TESTED BY A TEST BATTERY COMPRISING TESTS OF TACTILE SENSITIVITY, GRIP STRENGTH, MANUAL DEXTERITY, TRACKING, ASSEMBLY OF A STRUCTURE BY GROUPS, MENTAL ARITHMETIC, SYMBOL PROCESSING, SIMPLE PROBLEM SOLVING AND MEMORY. AT A DIVING TOWER AND A FLOODED QUARRY TEST DATA WAS COLLECTED FOR PERFORMANCE ON DRY LAND (CONTROL) AND AT WATER TEMPERATURES OF 72F., 62F., AND 47F. POST-DIVE URINE TEMPERATURES AND A LIMITED SAMPLE OF SKIN TEMPERATURES WERE RECORDED. DIVERS WORE A COMPLETE 3/16 IN. WEI SUIT, EXCEPT THAT DURING THE TESTS, THE HANDS WERE BARE. THE RESULTS SHOW: HAND IMPAIRMENT--LOSSES IN TACTILE SENSITIVITY, GRIP STRENGTH, AND MANUAL MOVEMENT; THE LOSSES WERE PROPORTIONAL TO DEGREE OF COLD AND EXPOSURE TIME; THE LOSSES FOLLOW A SIMILAR COURSE TO SKIN TEMPERATURE DECREASE AND HENCE ARE CONSIDERED DUE MAINLY TO PERIPHERAL PHYSIOLOGICAL ATTENUATIONS; PSYCHOMOTOR IMPAIRMENT--LOSSES IN MANUAL DEXTERITY, TRACKING, AND GROUP ASSEMBLY WERE PROPORTIONATE TO WATER TEMPERATURE; MENTAL IMPAIRMENT--LOSSES IN MENTAL CAPABILITY OCCURRED IN THOSE CASES WHERE THE TASK REQUIRED INTENSE ATTENTION AND INVOLVED CONSIDERABLE SHORT TERM MEMORY; 'BLOCKING' EFFECTS OCCURRED AT THE LOWER TEMPERATURES. THE CAUSES OF THE LOSSES IN CAPABILITY ARE DISCUSSED IN TERMS OF PERIPHERAL AND CENTRAL IMPAIRMENTS, IN TERMS OF 'WATER' EFFECTS AND 'COLD' EFFECTS, AND IN TERMS OF A HYPOTHESIS THAT IMMERSION IN COLD WATER SERVES TO DISTRACT THE DIVER. PRACTICAL AND THEORETICAL IMPLICATIONS OF THE STUDY ARE REVIEWED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-673 246 5/9 17/9
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
PSYCHOLOGY

THE ASSESSMENT OF ELECTRONICS CORRECTIVE MAINTENANCE
PERFORMANCE: II. PERFORMANCE ON THE AN/SPS-40 BY
ELECTRONICS TECHNICIANS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUL 68 110P RIGNEY, JOSEPH W. ;
REPT. NO. 1R-60
CONTRACT: NONR-248(22)
PROJ: NK-153-093

UNCLASSIFIED REPORT

DESCRIPTORS: (ELECTRONIC TECHNICIANS,
PERFORMANCE(HUMAN)), (RADAR EQUIPMENT,
MAINTAINABILITY), SHIPBORNE, NAVAL EQUIPMENT,
NAVAL PERSONNEL, MILITARY TRAINING, MAINTENANCE,
SAMPLING (U)
IDENTIFIERS: AN/SPS-40, TROUBLESHOOTING (U)

CORRECTIVE MAINTENANCE INCLUDES SYSTEM STATE
RECOGNITION, FAULT LOCALIZATION AND FAULT ISOLATION
TASKS. EIGHT PERFORMANCE TESTS INCORPORATING THESE
CRITERION TASKS WERE DEVELOPED FOR THE AN/SPS-40
RADAR, AND ADMINISTERED TO A SAMPLE OF FOURTEEN
SHIPBOARD NAVY ETS WHO HAD RECEIVED C SCHOOL
TRAINING IN THIS EQUIPMENT, AND WHO WERE RESPONSIBLE
FOR MAINTAINING IT ABOARD THEIR RESPECTIVE SHIPS.
THE TESTS WERE MEASURES OF SKILLS NECESSARY FOR THE
PERFORMANCE OF THE CRITERION TASKS, AND THEY PROVIDED
SCORES WHICH WERE MEASURES OF SUCCESS ON EACH OF
THESE TASKS. THEY ALSO PROVIDED DIAGNOSTIC DATA ON
THE VARIOUS SKILLS THAT YIELDED INFORMATION
CONCERNING THE SOURCES OF POOR PERFORMANCE. THE
TEST RESULTS SHOWED THAT THE ETS IN THE SAMPLE WERE
GOOD IN PERFORMING DESIGNATED FRONT PANEL CHECKS AND
IN MAKING NORMAL/ABNORMAL JUDGMENTS; THEY WERE
MODERATELY WEAK IN SELECTING ADDITIONAL CHECKS FOR
SYMPTOM ELABORATION; AND THEY WERE VERY POOR IN USING
STANDARD TEST EQUIPMENT, IN PERFORMING SYSTEM CHECKS,
AND IN ACCURATELY REDUCING FAULT AREAS. TRAINING
RECOMMENDATIONS FOR THE IMPROVEMENT OF CORRECTIVE
MAINTENANCE OF THE AN/SPS-40 ARE MADE. THESE
RECOMMENDATIONS ARE BASED ON ANALYSES OF THE RESULTS
OF THIS STUDY. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-673 532 6/14
DEEP SUBMERGENCE SYSTEMS PROJECT TECHNICAL OFFICE SAN
DIEGO CALIF

RESULTS OF PHYSIOLOGIC STUDIES CONDUCTED DURING
CHAMBER SATURATION DIVES FROM 200 FEET TO 825 FEET.
A PRELIMINARY REPORT. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,
MAY 68 BUP SHADLEY, MARK E.; VORUSHANTI,
JAMES; LINA-EAVER, PAUL W.; MAZZONE, WALTER F.
;
REPT. NO. USSP-TJ-MR-1-68
PROJ: 54607-U01
TASK: 11897

UNCLASSIFIED REPORT

DESCRIPTIONS: (DIVING, STRESS (PHYSIOLOGY)),
DEEP SUBMERGENCE, PRESSURE BREATHING, HELIUM,
OXYGEN, EXERCISE, PSYCHOPHYSIOLOGY, HEMATOLOGY,
BLOOD CHEMISTRY, CARDIOVASCULAR SYSTEM,
PSYCHOMETRICS, PERFORMANCE (HUMAN), LUNGS,
RESPIRATION, MOTOR REACTIONS (U)
IDENTIFIERS: AQUANAUTS, SEALAB 3 (U)

FROM FEBRUARY 1967 TO MAY 1968, A SERIES OF
SATURATION DIVES WAS CONDUCTED AT THE U.S. NAVY
EXPERIMENTAL DIVING UNIT. THESE DIVES WERE
DESIGNED TO TRAIN AND SELECT AQUANAUTS FOR THE OPEN
SEA SEALAB III EXPERIMENTS AS WELL AS TO MEASURE
THE PSYCHOPHYSIOLOGICAL EFFECTS ON MAN'S ABILITY TO
WORK AT GREAT DEPTHS. A WIDE VARIETY OF
HEMATOLOGICAL, BIOCHEMICAL, CARDIOPULMONARY AND
PSYCHOMETRIC STUDIES WERE MADE TO DETERMINE WHETHER
CHANGES OCCURRED DURING EXPOSURES TO HELIUM-OXYGEN
ATMOSPHERES AT GREAT DEPTHS. THE DATA IN THIS
PRELIMINARY REPORT WAS OBTAINED DURING 14 SATURATION
DIVES, RANGING IN DEPTH FROM 200 FEET TO 825 FEET.
PSYCHOLOGICAL STUDIES WERE CONDUCTED DURING 'WET'
EXCURSION DIVES TO DEPTHS OF 300, 825 AND 1025 FEET.
OVER 25,000 BIOMEDICAL OBSERVATIONS AND
MEASUREMENTS WERE OBTAINED IN THE COURSE OF THESE
DIVES. IN GENERAL THE RESULTS INDICATE THAT MAN
CAN EFFECTIVELY, SAFELY WORK AT DEPTHS UP TO 825 FEET
SATURATED. SOME DECREMENT IN COGNITIVE AND
NEUROMUSCULAR ABILITY WAS FOUND AS WELL AS IN CERTAIN
PULMONARY VENTILATORY PARAMETERS. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-674 528 5/7 6/11 6/19
GENERAL DYNAMICS CORP GRIFFIN CONN ELECTRIC BOAT DIV

DIVER PERFORMANCE MEASUREMENT; UNDERWATER NAVIGATION
DEPTH MAINTENANCE WEIGHT CARRYING CAPABILITIES. (U)

DESCRIPTIVE NOTE: ANNUAL TECHNICAL REPT. MAR 67-MAR
68.

JUL 68 46P ANDERSEN, BIRGER G. ;
REPT. NO. U-417-68-03U
CONTRACT: N00014-67-C-0447
PROJ: NR-196-068

UNCLASSIFIED REPORT

DESCRIPTORS: (SCUBA DIVERS, PERFORMANCE TESTS),
BUOYANCY, WEIGHT, INSTRUMENTATION, BREATHING
APPARATUS, TEST FACILITIES, ENVIRONMENTAL TESTS,
DESIGN, DATA TRANSMISSION SYSTEMS, MONITORS,
DATA PROCESSING SYSTEMS, AIR, UNDERWATER
NAVIGATION, PERFORMANCE (HUMAN), PHYSIOLOGY (U)

UNDERWATER MEASUREMENT TECHNIQUES WERE DEVELOPED
AND APPLIED TO TEST THE CAPABILITIES AND LIMITATIONS
OF FREE-SWIMMING SCUBA DIVERS IN TRANSPORTING OBJECTS
WITH VARYING DEGREES OF NEGATIVE BUOYANCY, AND TO
DETERMINE THE EFFECTS OF WEIGHT LOCATION ON
PERFORMANCE. THE CONDITIONS OF NEGATIVE BUOYANCY
CONSISTED OF 3-POUND, 6-POUND, AND 9-POUND WEIGHTS,
EITHER ATTACHED TO THE DIVER'S BODY OR HANDHELD BY
THE DIVER. QUANTITATIVE DATA WAS OBTAINED USING A
DIVER COMMUNICATION/TELEMETRY SYSTEM. THE MEASURES
OF DIVER PERFORMANCE RECORDED INCLUDED: DIVER
DEPTH, AIR CONSUMPTION RATE, SWIMMING SPEED, AND
NAVIGATIONAL ACCURACY. THE TESTS WERE PERFORMED IN
WATER 32 FEET DEEP OVER A 780-FOOT UNDERWATER TEST
RANGE. THE CAUSES FOR RESULTING PERFORMANCE
DECREMENTS ARE DISCUSSED IN TERMS OF WEIGHT AND
WEIGHT LOCATION EFFECTS. PRACTICAL IMPLICATIONS OF
THE STUDY RESULTS ARE REVIEWED. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-675 268 14/2 5/9 5/5
PSYCHOLOGICAL RESEARCH ASSOCIATES INC ARLINGTON VA

LAYOUT AND DESIGN CONSIDERATIONS OF RS-6 CONTROL
CONSOLES.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
FEB 56 43P BARKER, WILLIAM S. ;OLDER,
HARRY J. ;
REPT. NO. PRA-56-1
CONTRACT: NONR-1415(100)

UNCLASSIFIED REPORT

DESCRIPTORS: (•DISPLAY SYSTEMS, HUMAN
ENGINEERING), (•UNDERSEA WARFARE, TRAINING
DEVICES), (•TRAINING DEVICES, •CONTROL PANELS),
MODIFICATION KITS, DESIGN, STANDARDIZATION,
SUBMARINE PERSONNEL, STUDENTS, NAVAL TRAINING,
INSTRUCTORS, PLAN POSITION INDICATORS, MAINTENANCE
PERSONNEL, ROTARY SWITCHES, CATHODE RAY TUBES,
PANEL BOARD(S)ELECTRICITY), RADIO SONU BUOYS,
SUBMARINE MODELS, AIRPLANE MODELS, COMMUNICATION
SYSTEMS, NAVAL OPERATIONS, NAVAL SHORE
ESTABLISHMENTS

(U)

THIS REPORT CONTAINS A HUMAN ENGINEERING EVALUATION
OF TRAINING DEVICES USED IN MUCK SUBMARINE WARFARE
TACTICAL TRAINING.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-677 096 5/5 22/1
GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF

AN OUTLINE OF HUMAN ENGINEERING METHODS AND
INFORMATION INCLUDING MAN-IN-SPACE
CONSIDERATIONS.

(U)

OCT 60 2JP MOLESKOIN. M. I
REPT. NO. GDA-REL-R-037

UNCLASSIFIED REPORT

DESCRIPTORS: (SPACE MAINTENANCE, HUMAN
ENGINEERING), (EXTRAVEHICULAR ACTIVITY, SPACE
MAINTENANCE), SPACE CREWS, SPACE ENVIRONMENTAL
CONDITIONS, MAN-MACHINE SYSTEMS, COMMUNICATION
SYSTEMS, CONTROL PANELS, ILLUMINATION, DISPLAY
SYSTEMS, TELEVISION COMMUNICATION SYSTEMS,
STANDARDIZATION, CODING, SENSORY MECHANISMS,
MOTOR REACTIONS, CLOTHING, BEHAVIOR, NUTRITION,
DRUGS

(U)

THE MATERIAL IN THE OUTLINE IS INTENDED TO SERVE AS
A GUIDE AND SOURCE OF INFORMATION TO PERSONNEL WHO
MAY HAVE PROBLEMS REQUIRING THE APPLICATION OF HUMAN
ENGINEERING TECHNIQUES. IT IS INTENDED TO INDICATE
THE VARIETY OF PROBLEMS FOR WHICH HUMAN ENGINEERING
METHODS AND INFORMATION EXIST TO PROVIDE ASSISTANCE.
(AUTHOR)

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-676 846 6/17 6/1
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE
MEDICAL RESEARCH LAB

SATURATION-EXCURSION DIVING: BIOCHEMICAL CYCLE
FUNCTIONS IN LACTIC DEHYDROGENASE, LACTATE, AND
PYRUVATE RESPONSES, (U)

JUN 68 12P SCHAEFER, KARL E. ; JACEY,
MICHAEL J. ; CAREY, CHARLES R. ; MAZZONE, W. F.

REPT. NO. SMML-536
MONITOR: NAVMED MR005.04-0063-2

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V39 N4
P343-350 APR 68.

DESCRIPTORS: (1) DIVING, (2) METABOLISM, PRESSURE
BREATHING, OXIDOREDUCTASES, LACTATES, PYRUVATES,
HIGH-PRESSURE RESEARCH, UNDERWATER VEHICLES, DEEP
SUBMERGENCE (U)

IDENTIFIERS: METABOLIC CYCLES, LACTIC
DEHYDROGENASES, SEALAB 2 (U)

AS PART OF A GENERAL PREPARATORY PROGRAM FOR
SEALAB II, SATURATION-EXCURSION DIVES WERE
PERFORMED IN A DRY CHAMBER, USING COMPRESSED AIR.
THE EXPERIMENTS WERE PERFORMED TO TEST A DIVING
SCHEDULE FOR SATURATION-EXCURSION DIVES WITH
COMPRESSED AIR, AND TO MONITOR RESPONSES OF
PHYSIOLOGICAL FUNCTIONS TO THE HIGH PRESSURE
ENVIRONMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-680 028 5/10 15/7
BIOTECHNOLOGY INC ARLINGTON VA

AN INTEGRATED MEASUREMENT SYSTEM FOR THE STUDY OF
HUMAN PERFORMANCE IN THE UNDERWATER ENVIRONMENT, (U)

DEC 68 1009 REILLY, RAYMOND E. ; CAMERON,
BERNARD J. ;
CONTRACT: N00014-67-C-0410
PROJ: NH-196-074

UNCLASSIFIED REPORT

DESCRIPTORS: (•DEEP SUBMERGENCE,
PERFORMANCE(HUMAN)), (•PSYCHOMETRICS,
UNDERWATER), DIVING, PSYCHOMOTOR TESTS,
INTELLIGENCE TESTS, MOTOR REACTIONS,
REACTION(PSYCHOLOGY), ENVIRONMENTAL TESTS,
LOGIC CIRCUITS, DISPLAY SYSTEMS, TEST METHODS,
ELECTRONIC EQUIPMENT (U)

THE REPORT DESCRIBED A SYSTEM TO MEASURE HUMAN
MENTAL AND PERCEPTUAL-MOTOR FUNCTIONS AT AMBIENT
PRESSURES OF UP TO 444 LB/IN SQUARED, EQUIVALENT TO A
DEPTH OF 1000 FEET. DESIGNED FOR USE IN THE
ENVIRONMENTAL CHAMBERS AT THE NAVY EXPERIMENTAL
DIVING UNIT, THE SUBJECT'S EQUIPMENT WILL OPERATE
IN WET OR DRY SURROUNDINGS. THE SYSTEM PERMITS
REMOTE ADMINISTRATION AND SCORING OF 26 SPECIFIC
TESTS RANGING FROM SIMPLE REACTION TIME TO COMPLEX
MANUAL TRACKING, AND FROM MONITORING A SIMPLE DISPLAY
TO SOLVING DIFFICULT MENTAL ARITHMETIC AND SYMBOLIC
PROBLEMS. AS A FORMAL TEST BATTERY AND GENERAL
RESEARCH TOOL, THE SYSTEM IS EXPECTED TO HAVE
EXTENSIVE APPLICATION IN THE AREAS OF (1)
SPECIFICATION OF HUMAN UNDERWATER PERFORMANCE
CAPABILITIES, (2) DELINEATION OF FACTORS OF THE
DIVING ENVIRONMENT WHICH AFFECT PERFORMANCE, AND
(3) DEVELOPMENT OF DIVER SELECTION CRITERIA.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK2J

AU-680 33/ 9/3 8/3 8/10 13/10
SCRIPPS INSTITUTION OF OCEANOGRAPHY SAN DIEGO CALIF MARINE
PHYSICAL LAB

MAINTENANCE OF SEA-FLOOR ELECTRONICS. (U)

MAR 68 IIP ANDERSON, VICTOR C. I
REPT. NO. MPL-U-63/67
CONTRACT: N00R-2416(US)
PROJ: NR-260-103

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN IEEE TRANSACTIONS ON
AEROSPACE AND ELECTRONIC SYSTEMS, VAES-4, NS P650-
658 SEP 68.

SUPPLEMENTARY NOTE: PRESENTED AT 1967 EASTCON,
WASHINGTON, D. C., 16-18 OCT 67.

DESCRIPTORS: (ELECTRONIC EQUIPMENT, MAINTENANCE),
(MAINTENANCE, UNDERWATER EQUIPMENT),
POSITIONING DEVICES(MACHINERY), MAINTENANCE
PERSONNEL, DIVING, REMOTE CONTROL SYSTEMS, COSTS,
LABORATORIES, OCEANOLOGY (U)
IDENTIFIERS: MANIPULATORS (U)

THIS PAPER DISCUSSES SOME OF THE PRESENT
DEVELOPMENTS IN IN SITU ELECTRONICS MAINTENANCE BY
THE USE OF DIVERS AND BY REMOTE MANIPULATORS, AND
RELATES THE EFFECT OF THESE DEVELOPMENTS TO THE
OPERATING COST OF FUTURE SEA-FLOOR INSTRUMENTATION
SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-684 474 6/17
NAVAL MEDICAL RESEARCH INST BETHESDA MD

PHYSIOLOGICAL EVALUATION OF A FREE-FLOODING DIVER
HEAT REPLACEMENT GARMENT.

(U)

DESCRIPTIVE NOTE: MEDICAL RESEARCH INTERIM REPT.,
FEB 69 10F CONDI, KENNETH R.; TAUBER,
JOHN F.;
MONITOR: NAVMED MF12.524.014-1004-17

UNCLASSIFIED REPORT

DESCRIPTIONS: (•DIVING, •PROTECTIVE CLOTHING),
UNDERWATER CLOTHING, BODY TEMPERATURE, HEAT
TRANSFER, RESPONSES, DESIGN, TEMPERATURE, WATER

(U)

THE GENERAL CAPABILITIES OF A FREE-FLOODING HEAT
REPLACEMENT GARMENT IN MAINTAINING THERMAL COMFORT IN
40F WATER, AT BOTH SURFACE AND DEEP DIVING
CONDITIONS, ARE CONSIDERED. SUIT INLET AND OUTLET
TEMPERATURE, FLOW RATE, SKIN AND RECTAL TEMPERATURES,
AND DIVERS' SUBJECTIVE COMFORT LEVEL WERE RECORDED.
SUIT INLET TEMPERATURES WHICH PRODUCE A SUBJECTIVE
RESPONSE OF THERMAL COMFORT BY THE DIVER (COMFORT
ZONE INLET TEMPERATURE) AT VARIOUS FLOW RATES
ARE PRESENTED FOR SURFACE CONDITIONS AND THROUGH USE
OF A HEAT BALANCE EQUATION, FOR DEPTH CONDITIONS.
WHILE THE SUIT IS CONSIDERED INEFFICIENT BECAUSE OF
ITS HIGH POWER REQUIREMENTS, ESPECIALLY AT DEPTH, ITS
WEARABILITY AND MODE OF HEAT TRANSFER MAKE IT AN
EXCELLENT HEAT REPLACEMENT GARMENT. (AUTHOR)

(U)

UNCLASSIFIED

DUC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-684 176 2U/o 6/16
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE
MEDICAL RESEARCH LAB

THE UNDERWATER VISIBILITY OF COLORS WITH ARTIFICIAL
ILLUMINATION. (U)

UCT 68 14P KINNEY, JO ANN S. ; LURIA,
S. M. ; WEITZMAN, DONALD G. ;
REPT. NO. SMRL-551
MONITOR: NAVMED MF12-524-004-9014D-1

UNCLASSIFIED REPORT

DESCRIPTORS: (COLORS, UNDERWATER LIGHTS),
(VISUAL PERCEPTION, UNDERWATER), VISIBILITY,
MERCURY LAMPS, INCANDESCENT LAMPS, SCUBA DIVERS,
CAMOUFLAGE, TEST METHODS, RIVERS, SEA WATER,
TEST EQUIPMENT, TARGETS (U)
IDENTIFIERS: UNDERWATER VISIBILITY,
TURBIDITY (U)

THE VISIBILITY OF VARIOUS COLORS UNDERWATER WITH
ARTIFICIAL ILLUMINATION HAS BEEN MEASURED IN THREE
DIFFERENT BODIES OF WATER CHOSEN TO SAMPLE A
CONTINUUM FROM CLEAR TO TURBID. SUBJECTS WERE
SCUBA DIVERS WHO OBSERVED THE COLORS AT NIGHT,
USING A MERCURY OR AND INCANDESCENT LIGHT SOURCE.
THE VISIBILITY RESULTS SHOW NUMEROUS INTERACTIONS
AMONG COLOR, FLUORESCENCE, TYPE OF LIGHT SOURCE, AND
TYPE OF WATER; FROM THEM, IT IS POSSIBLE TO SELECT
THE OPTIMUM COMBINATION TO BE USED UNDER A WIDE
VARIETY OF CONDITIONS. COLORS ARE SPECIFIED THAT
WILL (1) MAXIMIZE VISIBILITY, (2) PROVIDE THE
BEST CAMOUFLAGE, AND (3) ALLOW DISTINCT COLOR
DIFFERENCES IN APPEARANCE FOR USE IN COLOR CODING.
THESE RESULTS ARE SUMMARIZED IN TERMS OF THE COLORS
THAT ARE MOST EFFECTIVE FOR USE UNDER VARIOUS
OPERATIONAL CONDITIONS ENCOUNTERED UNDERWATER.
(AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-684 871 5/10
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING

ADAPTATION OF DIVERS TO DISTORTION OF SIZE AND
DISTANCE UNDERWATER. (U)

DESCRIPTIVE NOTE: BIOTECHNOLOGY LAB. TECHNICAL REPT.,
JAN 69 3YP ROSS, HELEN E. FRANKLIN,
SAMUEL S. WELTMAN, GERSHON;
REPT. NO. IR-45, 68-61
CONTRACT: N00014-67-A-0111

UNCLASSIFIED REPORT

DESCRIPTORS: (VISUAL PERCEPTION, UNDERWATER),
(DIVING, VISUAL PERCEPTION),
ADAPTATION (PHYSIOLOGY),
ADJUSTMENT (PSYCHOLOGY), PERFORMANCE (HUMAN),
SPACE PERCEPTION, DISTORTION (U)

THIS REPORT DESCRIBES A SERIES OF FIVE EXPERIMENTS
CONDUCTED DURING SUMMER 1968 TO EXAMINE ADAPTATION OF
DIVERS TO SIZE AND DISTANCE DISTORTION UNDERWATER.
VISUALLY PERCEIVED DISTORTIONS OF SIZE AND DISTANCE
ARE PRODUCED BY THE DIVER'S FACEMASK WHICH INTRODUCES
AN AIR-WATER INTERFACE BETWEEN THE EYE AND THE OBJECT
OF REGARD. THE EFFECT OF THIS INTERFACE IS TO
DECREASE IMAGE DISTANCE BY ABOUT ONE-FOURTH. UNDER
THESE CONDITIONS OBJECTS ARE LIKELY TO BE REPORTED AS
CLOSER OR LARGER, OR CLOSER AND LARGER THAN THEY
ACTUALLY ARE. ADAPTATION TO DISTORTIONS OF SIZE
AND DISTANCE WERE INVESTIGATED BY TWO TECHNIQUES:
(1) THE METHOD OF ADJUSTMENT WHERE A DIVER
ADJUSTED THE SIZE OF A HORIZONTAL LINE, SET IN THE
FRONTAL PLANE AT A FIXED DISTANCE, TO A LENGTH OF 12
INCHES, (2) THE METHOD OF ESTIMATION WHERE THE
DIVER RECORDED HIS JUDGMENTS OF THE SIZE AND DISTANCE
OF A SERIES OF TARGETS WHICH VARIED ON THESE
DIMENSIONS. OF THE FIVE EXPERIMENTS CONDUCTED IN
THE UNDERWATER RESEARCH FACILITY TANK AND
SWIMMING POOL AT UCLA AND IN THE OCEAN, THREE WERE
SUCCESSFUL IN DEMONSTRATING ADAPTATION.
(AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-686 174 5/9
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

ANNOTATED BIBLIOGRAPHY OF HUMAN FACTORS LABORATORY
REPORTS (1945-1968). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 69 376P KURTZ, ALBERT K. SMITH,
MARY C. ;
REPT. NO. NAVTRADVICE-IN-158

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN ENGINEERING,
BIBLIOGRAPHIES), ABSTRACTS, INDEXES, TRAINING
DEVICES, NAVAL TRAINING, ELECTRONIC EQUIPMENT,
PHOTOGRAPHIC TECHNIQUES, PERFORMANCE (HUMAN),
SENSORY PERCEPTION, SONAR, PSYCHOMETRICS,
DISPLAY SYSTEMS, RADAR EQUIPMENT, MAN-MACHINE
SYSTEMS, CONTROL SYSTEMS, SUBMARINES,
COMMUNICATION SYSTEMS, NAVAL AVIATION (U)
IDENTIFIERS: ANNOTATED BIBLIOGRAPHIES, RATING
SYSTEMS (U)

A COMPLETE BIBLIOGRAPHIC REFERENCE AND AN ABSTRACT
ARE GIVEN FOR EACH OF THE 765 PUBLICATIONS OF THE
HUMAN FACTORS LABORATORY FROM 1945 THROUGH
1968. THE CITATIONS ARE ARRANGED CHRONOLOGICALLY
AND ARE FOLLOWED BY THREE INDEXES: INDEX BY SOURCE
(CONTRACTOR OR IN-HOUSE), AUTHOR INDEX, AND
SUBJECT MATTER INDEX. THE LATTER CONSISTS OF ABOUT
500 TOPICS. EACH OF THE 765 REPORTS HAS AT LEAST
FOUR OF THESE SUBJECT MATTER REFERENCES; MOST REPORTS
HAVE TWO OR THREE TIMES THIS MANY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-668 190 5/10 13/10
CALIFORNIA UNIV LOS ANGELES BIOTECHNOLOGY LAB

UNDERWATER WORK MEASUREMENT TECHNIQUES: 1968
STUDIES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

APR 69 64P WELTMAN, GERSHON ; CHRISTIANSON,
RAYMOND A. ; EGSTROM, GLEN H. ; CROOKS, THOMAS
P. ;
REPT. NO. 69-19, TR-46
CONTRACT: N00014-67-A-0111
PROJ: NR-196-069

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO INITIAL STUDIES DATED MAR
68, AD-668 180.

DESCRIPTORS: (1-PERFORMANCE (HUMAN)),
UNDERWATER), (1-DIVING, PERFORMANCE (HUMAN)),
ENVIRONMENT, SEA WATER, BIOMETRY, SHALLOW WATER,
SIMULATION, STRESS (PSYCHOLOGY), RESPIRATION,
MONITORS, TEST METHODS, INSTRUMENTATION,
RECORDING SYSTEMS, UNDERWATER VEHICLES, DEEP
SUBMERGENCE, TABLES

(U)

IDENTIFIERS: UNDERWATER WORK MEASUREMENT, SEALAB 3
MANNED SUBMERSIBLE

(U)

THE REPORT REVIEWS PROGRESS FOR THE PERIOD
FEBRUARY 1, 1968 TO JANUARY 31, 1969 IN THE STUDY
OF UNDERWATER WORK MEASUREMENT TECHNIQUES BEING
CONDUCTED AT THE UNIVERSITY OF CALIFORNIA, LOS
ANGELES. RESEARCH EFFORTS CONCENTRATED ON A
STUDY OF THE EFFECTS OF OCEAN ENVIRONMENT AND
EXPERIENCE ON UNDERWATER WORK PERFORMANCE, AND ON
PERFORMANCE MEASUREMENT DURING SEALAB III SHALLOW
WATER TRIALS OF THE SALVAGE AND CONSTRUCTION TASKS.
ADVANCES WERE ALSO MADE IN THE EQUIPMENT USED FOR
UNDERWATER WORK MEASUREMENT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-690 428 13/10
ARCTIC INST OF NORTH AMERICA WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN THE ARCTIC. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
BY OP MILNE, A. R. ;
CONTRACT: NONR-3446(U)
PROJ: NR-307-105

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ARCTIC, JNL. OF THE
ARCTIC INSTITUTE OF NORTH AMERICA, V22 N1 P69-70
MAR 69.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH DEFENCE
RESEARCH BOARD, OTTAWA (ONTARIO).

DESCRIPTORS: (OCEANOLOGY, ARCTIC OCEAN),
(UNDERWATER VEHICLES,
PERFORMANCE(ENGINEERING)), SEA ICE, DIVING.
UNDERWATER SOUND, CANADA (U)
IDENTIFIERS: PISCES I VESSEL, MANNED
SUBMERSIBLES (U)

REPORTS ON THE TWO-MAN UNDERSEA WORK BOAT PISCES
I WHICH MADE A TOTAL OF 15 DIVES DURING A SIX-WEEK
JOINT SCIENTIFIC ENTERPRISE IN THE CANADIAN
ARCTIC ARCHIPELAGO IN 1966. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK2J

AU-690 428 13/10
ARCTIC INST OF NORTH AMERICA WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN THE ARCTIC. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
67 6P MILNE, A. R. ;
CONTRACT: NONR-3996(U)
PROJ: NR-307-105

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ARCTIC, JNL. OF THE
ARCTIC INSTITUTE OF NORTH AMERICA, V22 N1 P69-70
MAR 69.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH DEFENCE
RESEARCH BOARD, OTTAWA (ONTARIO).

DESCRIPTORS: (OCEANOLOGY, ARCTIC OCEAN),
(UNDERWATER VEHICLES,
PERFORMANCE(ENGINEERING)), SEA ICE, DIVING,
UNDERWATER SOUND, CANADA (U)
IDENTIFIERS: PISCES I VESSEL, MANNED (U)
SUBMERSIBLES

REPORTS ON THE TWO-MAN UNDERSEA WORK BOAT PISCES
I WHICH MADE A TOTAL OF 19 DIVES DURING A SIX-WEEK
JOINT SCIENTIFIC ENTERPRISE IN THE CANADIAN
ARCTIC ARCHIPELAGO IN 1968. (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-092-23 6/11 6/17
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

DIVER EQUIPMENT TESTS PERFORMED DURING THE JOINT U.
S. NAVY/DUKE UNIVERSITY 1000 FOOT SATURATION
DIVE. (U)

DESCRIPTIVE NOTE: FINAL REPT.:
APR 69 JSP HANSEN, JOHN V. :
REPT. NO. NEDU-HK-2-69

UNCLASSIFIED REPORT
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

DESCRIPTIONS: (•UNDERWATER CLOTHING, •BREATHING
APPARATUS), (•LIVING, LIFE SUPPORT),
PERFORMANCE (HUMAN), THERMAL INSULATION, TEST
METHODS, RESPIRATION, DESIGN (U)

A SERIES OF DIVING EQUIPMENT TESTS WERE PERFORMED
AT DEPTHS OF 1000 AND 850 FEET DURING THE JOINT
DUKE UNIVERSITY/NAVY 1000 FEET SATURATION DIVE
AT DUNHAM, NORTH CAROLINA. DESCRIPTION OF
TESTS PERFORMED AND RESULTS THEREOF ARE PRESENTED FOR
DOCUMENTATION PURPOSES. RECOMMENDATIONS FOR
MODIFICATIONS AND FURTHER TESTING ARE PRESENTED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-692 424 6/11 6/19
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

JOINT U. S. NAVY-DUKE UNIVERSITY FOOT
SATURATION DIVE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
APR 69 SJP SUMMITT, JAMES K. ; KELLEY,
JAMES S. ; HERKON, JERRY M. ; SALTZMAN, HERBERT
A. ;
REPT. NO. NEDU-RH-J-69

UNCLASSIFIED REPORT

DESCRIPTIONS: (LIFE SUPPORT, UNDERWATER VEHICLES),
(DIVING, STRESS (PHYSIOLOGY)),
PERFORMANCE (HUMAN), OXYGEN, CARBON DIOXIDE,
DIVING, DEEP SUBMERGENCE, EAR, BAROMETRIC
PRESSURE, CLOSED ECOLOGICAL SYSTEMS (U)
IDENTIFIERS: HYPERBARIC MEDICINE (U)

FIVE EXPERIMENTAL SUBJECTS WERE EXPOSED TO A
SIMULATED DEPTH OF 1000 FEET OF SEAWATER IN THE
DUKE UNIVERSITY HYPERBARIC CHAMBER COMPLEX. THE
COMPRESSION PHASE WAS COMPLETED OVER A 24 HOUR AND 22
MINUTE PERIOD, AN AVERAGE DESCENT RATE OF 1.5 MINUTES
PER FOOT. THE SUBJECTS REMAINED AT THE 1000 FOOT
DEPTH FOR 77 HOURS AND 30 MINUTES. THIS WAS
FOLLOWED BY 284 HOURS OF DECOMPRESSION, A RATE OF
APPROXIMATELY 15 MINUTES PER FOOT WITH FOUR HOUR
STOPS AT TEN STAGING DEPTHS. AN EXTENSIVE SERIES OF
BIOMECHANICAL, DIVING EQUIPMENT AND HUMAN PERFORMANCE
TESTS WERE CONDUCTED DURING EACH PHASE OF THE DIVE
SEQUENCE. OXYGEN AND CARBON DIOXIDE LEVELS WERE
VERY ACCURATELY CONTROLLED WITHIN SAFE LIMITS, THOUGH
THE OXYGEN WAS MANIPULATED PERIODICALLY TO MEET THE
REQUIREMENTS OF SPECIFIC BIOMEDICAL EXPERIMENTS.
THESE OBSERVATIONS INDICATE THAT DIVERS CAN PERFORM
WELL UNDER THESE CONDITIONS IF LIFE SUPPORT SYSTEMS
MAINTAIN A LEVEL OF SUPPORT EQUIVALENT TO THAT AT THE
SURFACE. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEAMANTH CONTROL NO. /ZHK23

AU-695 377 6/19
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO
CALIF

SLEEP REQUIREMENTS OF MAN-IN-THE-SEA. (U)

AUG 69 4AP HAITON PAUL (TOWNSEND, R. I.
GREENWOOD, M. I.
REPT. NO. NMNRU-68-24
PROJ. M4306.03-20210

UNCLASSIFIED REPORT

DESCRIPTORS: (SLEEP, DIVING), SUBMARINES,
PERFORMANCE (HUMAN), BEHAVIOR,
FATIGUE (PHYSIOLOGY), ADAPTATION (PHYSIOLOGY),
NITROGEN, CONTROLLED ATMOSPHERES, CONFINED
ENVIRONMENTS (U)
IDENTIFIERS. AQUANAUTS, TEXTITE I (U)

DESPITE RECENT SCIENTIFIC AND TECHNOLOGICAL GAINS
IN REALIZING THE GOAL OF MANNED UNDERWATER STATIONS,
THERE HAS BEEN A SINGULAR LACK OF RESEARCH DATA ON
DEFINING THE SLEEP REQUIREMENTS OF MAN-IN-THE-SEA.
BEHAVIORALLY, SLEEP LOSS AND SLEEP DISTURBANCES
PRODUCE LAPSES IN PERFORMANCE AND IMPAIRMENT OF
SHORT-TERM MEMORY, EITHER OF WHICH MAY ENDANGER THE
MISSION OR THE LIFE OF THE ENTIRE CREW OF AN OCEAN
FLOOR HABITAT. INTERPERSONAL DIFFICULTIES MAY ALSO
ARISE AS A RESULT OF UNDESIRABLE PERSONALITY CHANGES
CAUSED BY SLEEP DISTURBANCES, THEREBY WEAKENING THE
VERY ROOT OF THE MINIATURE SOCIETY OF THE OCEAN FLOOR
HABITAT. RESEARCH EFFORTS MUST BE SPURRED ON TO
LEARN: (1) WHETHER MAN AS AN AQUANAUT MAY
DEVELOP NEW KINDS OF SLEEP REQUIREMENTS WHICH DIFFER
FROM THOSE OF LAND BASED MAN, (2) WHETHER MAN MAY
ALSO DEVELOP SERIOUS SLEEP DISTURBANCES, WHETHER WE
CAN SPECIFY THE OPTIMAL PHYSICAL AND PSYCHOLOGICAL
CONDITIONS FOR MAN'S RECUPEKATION FROM FATIGUE BY
ADEQUATE SLEEP IN THE UNDERWATER HABITAT. TEXTITE
I, A NITROGEN SATURATION DIVING EXPERIMENT IS USED
TO ILLUSTRATE AN ATTEMPT TO OBTAIN THE DATA NECESSARY
TO DEFINE SLEEP REQUIREMENTS OF MAN-IN-THE-SEA.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-695 034 5/10 4/2
APPLIED PSYCHOLOGICAL SERVICES INC WAYNE PA SCIENCE
CENTER

DIGITAL SIMULATION OF THE PERFORMANCE OF
INTERMEDIATE SIZE CREWS. 1. LOGIC OF A MODEL
FOR SIMULATING CREW PSYCHOSOCIAL AND PERFORMANCE
VARIABLES.

(U)

SEP 64 101P SIGEL, ARTHUR I. ; WOLF, J.
JAY FISCHL, M. A. ;
CONTRACT. NU0014-66-C-0262
PROJ: NM-170-710

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UNCLASSIFIED REPORT

DESCRIPTIONS: (1) MAN-MACHINE SYSTEMS, MATHEMATICAL
MODELS; (2) GROUP DYNAMICS, SIMULATION; NAVAL
RESEARCH, PSYCHOMETRICS, SOCIOMETRICS,
PERFORMANCE (HUMAN); MILITARY PSYCHOLOGY,
DIGITAL COMPUTERS, LOGIC CIRCUITS,
STRESS (PSYCHOLOGY), FATIGUE (PHYSIOLOGY),
ENERGY, EFFICIENCY, NAVAL PERSONNEL

(U)

SELECTED PSYCHOSOCIAL, PERSONNEL, AND PERFORMANCE
VARIABLES ARE IDENTIFIED AND DISCUSSED AS THEY APPLY
TO THE SITUATION OF CREWS OF MODERATE SIZE. BASED
ON CURRENT PSYCHOLOGICAL THEORY, MILITARY DOCTRINE,
AND PREVIOUSLY DEVELOPED AND TESTED FUNCTIONAL
RELATIONSHIPS, THESE VARIABLES ARE WOVEN INTO A
STOCHASTIC MATHEMATICAL MODEL FOR DIGITALLY
SIMULATING CLOSED MAN-MACHINE SYSTEMS OPERATED BY
CREWS OF FROM 4 TO 20 MEMBERS. THE PROBABILISTIC
MODEL IS PRESENTED IN TERMS OF A DETAILED LOGIC AND
PROCESSING FLOW SEQUENCE WITH PRESCRIBED INPUT DATA.
RESULTS FROM THE THE MODEL, AS CALLED FOR BY THE
LOGIC, INCLUDE MEASURES OF PERSONNEL LOADING, CREW
SAFETY, AND CREW PERFORMANCE ADEQUACY.

(AUTHOR)

(U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AUG 69 124 8/16
NAVAL HOSPITAL GREAT LAKES ILL MEDICAL SERVICE

MAN'S PERFORMANCE IN THE SEA SEMINAR. (U)

DESCRIPTIVE NOTE: PROGRESS REPT.,
SEP 69 124 MOLLIER, HARRY ; BRANDT, JOHN ;
DLN. JOURNAL ;
REPT. NO. CSL/JNN-26
CONTRACT: NONN-50012U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON UNDERWATER SPEECH
COMMUNICATION.

DESCRIPTORS: (OCEANOLOGY, SYMPOSIA),
(UNDERWATER COMMUNICATION SYSTEMS, SPEECH
RECOGNITION), SCUBA DIVERS,
PERFORMANCE (HUMAN), VOICE COMMUNICATION SYSTEMS,
DIVING, MAN-MACHINE SYSTEMS (U)

A SEMINAR WAS CONDUCTED IN ORDER TO INFORM AND
STIMULATE YOUNG WORKERS OF HIGH RESEARCH POTENTIAL
WITH RESPECT TO APPROPRIATE RESEARCH CONCEPTS, DESIGN
AND METHODOLOGY - AND CURRENT OCEANOGRAPHIC PROJECTS.
THE FOCUS OF THE SEMINAR WAS ON MAN'S PERFORMANCE
IN THE SEA AND IT WAS DEVELOPED WITH RESPECT TO FIVE
MAJOR AREAS OF UNDERWATER RESEARCH: PERCEPTION,
PHYSIOLOGY, WORK PERFORMANCE, COMMUNICATION AND
HABITATS. THE DOCUMENT IS COMPRISED OF A LIST OF
PARTICIPANTS AND THE SEMINAR SCHEDULE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-69/ 737 6/14
NORTH AMERICAN ROCKWELL CORP DOWNEY CALIF SPACE DIV

A STUDY OF WORK-PRODUCING CHARACTERISTICS OF
UNDERWATER OPERATIONS AS A FUNCTION OF DEPTH. (U)

DESCRIPTIVE NOTES: FINAL REPT. MAY-NOV 69,
NOV 69 48P STREIMER, I. ;
REPT. NO. DD-69-712
CONTRACT: N00014-67-C-0363
PROJ: AR-146-U70

UNCLASSIFIED REPORT

Reproduced from
best available copy. 

DESCRIPTORS: (EXERCISE, BAROMETRIC PRESSURE),
(DIVING, EXERCISE), METABOLISM,
PERFORMANCE (HUMAN), BODY TEMPERATURE, HEART,
SKIN, RESPIRATION, OXYGEN CONSUMPTION,
STATISTICAL ANALYSIS, MEASUREMENT (U)
IDENTIFIERS: ERGOMETRICS (U)

THE EFFECTS OF ALTERATIONS IN WORKING DEPTH UPON
THE WORK-PRODUCING CHARACTERISTICS OF HUMAN
PERFORMING SPECIFIC UNDERWATER MANUAL TASKS WERE
EXAMINED. THE TASKS WERE: (1) A SIMPLE,
REPETITIVE ROTARY TASK REQUIRING CONTINUOUS TORQUE
PRODUCTION AGAINST A FIXED RESISTANCE IN A SELF-PACED
MANNER; AND (2) A SIMPLE, REPETITIVE,
DISCONTINUOUS FLEXION/EXTENSION TASK REQUIRING THE
EXERTION OF LINEAR FORCES AGAINST A FIXED RESISTANCE
IN A SELF-PACED MANNER. THE WORK WAS PERFORMED AT
TWO DEPTHS, 33 AND 66 FEET IN THE OPEN OCEAN.
DURING WORK SESSIONS, HEART RATE AND THREE SKIN
TEMPERATURES WERE RECORDED. SIMILARLY, TECHNIQUES
WERE EMPLOYED WHICH ALLOW MEASUREMENT OF MEAN
RESPIRATORY FLOW VOLUMES AND OXYGEN UPTAKE LEVEL.
THE RESULTS OBTAINED WERE EXAMINED AS FUNCTIONS OF
TASK AND DEPTH. STATISTICALLY SIGNIFICANT
PERFORMANCE DIFFERENCES WERE FOUND AND RELATED TO
PREVIOUS STUDY RESULTS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD#697 939 5/8
NORTH AMERICAN ROCKWELL CORP COLUMBUS OHIO COLUMBUS
DIV

SYMPOSIUM ON APPLIED MODELS OF MAN-MACHINE SYSTEMS
PERFORMANCE, COLUMBUS, OHIO, 12-14 NOVEMBER
1968.

(U)

DESCRIPTIVE NOTE: FINAL REPT.:
NOV 69 340P LEVY, GERALD W. ;
REPT. NO. NR69H-59;
CONTRACT: N00014-68-C-0418
PROJ: NR-196-083

UNCLASSIFIED REPORT

DESCRIPTORS: (MAN-MACHINE SYSTEMS, SYMPOSIA),
PERFORMANCE(ENGINEERING), MATHEMATICAL MODELS,
HUMAN ENGINEERING, CYBERNETICS,
PERFORMANCE(HUMAN), TARGET ACQUISITION, VISUAL
PERCEPTION, SONAR PERSONNEL, DETECTION,
SIMULATION, RELIABILITY, IDENTIFICATION
IDENTIFIERS. COMPUTERIZED SIMULATION

(U)

(U)

CONTENTS: THE ROLE OF APPLIED MAN-MACHINE
MODELS; THE DEVELOPMENT OF SOPHISTICATED MODELS OF
MAN-MACHINE SYSTEM PERFORMANCE; CRITERIA FOR
SELECTION AND APPLICATION OF MODELS; A VISUAL
TARGET ACQUISITION MODEL; UNFINISHED BUSINESS IN
THE UTILITY OF VISUAL DETECTION MODELS; MODELING
THE SONAR OPERATOR'S DETECTION PROCESS--A PROGRESS
REPORT; FIELD EVALUATION OF A VISUAL DETECTION
MODEL; HUMAN OPERATOR MODELS FOR MANUAL CONTROL;
EXPOSITION OF A HUMAN CONTROL MODEL AND ITS
APPLICATION; COMPUTER SIMULATION--SAVION,
SANCTUARY, ON SILLINESS; ASSUMPTIONS UNDERLYING THE
HUMAN RELIABILITY MODEL; APPLICATION OF A MULTIPLE
TASK INTERACTIVE MODEL--SIMULATION OF HUMAN
PERFORMANCE IN SONAR MAINTENANCE.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-696 310 5/10

GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

DIVER PERFORMANCE MEASUREMENT: TRANSPORTING
NEUTRALLY BUOYANT OBJECTS MANUAL MOVEMENT OF HEAVY
OBJECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 APR 68-31 MAR 69.

JUL 69 44P ANDERSEN, B. G. ALLEN, F.

L. ILAIB, J. C. I

REPT. NO. U417-04-U68

CONTRACT: N00014-67-C-0447

PROJ: NR-146-U68

UNCLASSIFIED REPORT

Reproduced from
best available copy.



DESCRIPTORS: (*PERFORMANCE(HUMAN), *SWIMMING),
MEASUREMENT, FATIGUE(PHYSIOLOGY), ENDURANCE,
DIVING, WEIGHT, DRAG, VELOCITY, MOBILITY (U)

THE REPORT PRESENTS THE RESULTS OF THE SECOND PHASE
IN A PROGRAM OF DIVER PERFORMANCE MEASUREMENT. THE
PURPOSE OF THE PROGRAM WAS TO DEVELOP AND APPLY
MEASUREMENT TECHNIQUES TO DETERMINE A FREE-SWIMMING
DIVER'S CAPACITY TO TRANSPORT OBJECTS OF VARYING SIZE
AND WEIGHT UNDERWATER. TWO EXPERIMENTS WERE
CONDUCTED DURING THIS PHASE OF THE PROGRAM. THE
FIRST WAS TO MEASURE A DIVER'S ABILITY TO SWIM WITH
NEUTRALLY BUOYANT OBJECTS OF VARYING SIZE TO
DETERMINE THE EFFECTS OF INCREASED DRAG ON A SWIMMER.
THE SECOND EXPERIMENT CONSISTED OF AN EXPLORATORY
INVESTIGATION OF A DIVER'S ABILITY TO MOVE HEAVY
OBJECTS UNDERWATER FOR SHORT DISTANCES.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-694 170 6/11 15/5
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

AD HUC COMMITTEE REPORT. (U)

DESCRIPTIVE NOTE: RESEARCH REPT. 7-25 JAN 68,
66 73P MURDOCH, RICHARD A. BEAGLES,
JOHN A. ELAINS, JAMES H. FURAN, MICHAEL J.
JENKINS, WALLACE T. J
REPT. NO. NEDU-RK-3-68

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, MILITARY
REQUIREMENTS), (DIVING, LIFE SUPPORT),
LOGISTICS, HELMETS, BREATHING APPARATUS, GAS
FLOW, COMMUNICATION SYSTEMS, LOGISTICS,
DECOMPRESSION SICKNESS (U)

THE OBJECT OF THE STUDY WAS TO SURVEY THE FIELD OF
DIVING EQUIPMENTS, CATALOGUE DEFICIENCIES OF EXISTING
EQUIPMENTS, ENUMERATE EQUIPMENTS NOT NOW AVAILABLE
WHICH SHOULD BE DEVELOPED AND TO RECOMMEND SHORT AND
LONG RANGE DEVELOPMENT PROGRAMS. A SUMMARY OF COST
BY EQUIPMENT IS INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-702 060 8/10 14/2 6/11
OFFICE OF NAVAL RESEARCH WASHINGTON D C

SUMMARY REPORT ON PROJECT TEKITE 1. A
MULTIAGENCY 60-DAY SATURATED DIVE CONDUCTED BY THE
UNITED STATES NAVY, THE NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION, THE DEPARTMENT OF THE
INTERIOR, AND THE GENERAL ELECTRIC COMPANY, (U)

JAN 70 59P PAULI, D. C. ; COLE, H. A.

REPT. NO. ONR-DR-153-S

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UNCLASSIFIED REPORT

DESCRIPTORS: (OCEAN BOTTOM, LABORATORIES),
(CONTINENTAL SHELVES, EXPLORATION), (LIFE
SUPPORT, OCEAN BOTTOM), DIVING, CLOSED
ECOLOGICAL SYSTEMS, UNDERWATER, VENTILATION,
COMMUNICATION SYSTEMS, UNDERWATER CLOTHING,
SAFETY, DESIGN, MARINE ENGINEERING, MARINE
BIOLOGY, MARINE GEOLOGY, ADJUSTMENT (PSYCHOLOGY),
VIRGIN ISLANDS (U)

IDENTIFIERS. *TEKITE 1 PROGRAM (U)

AN OCEAN FLOOR HABITAT AT A 49 FOOT DEPTH AND THE
SUPPORTING FACILITIES WERE ESTABLISHED AND EVALUATED
FOR 60 DAYS AT A CAREFULLY SELECTED, ISOLATED SITE IN
THE VIRGIN ISLANDS FROM FEBRUARY 15 TO APRIL
15, 1969. FOUR MARINE SCIENTISTS LIVED IN AND
WORKED OUT OF THE HABITAT FOR THE 60-DAY PERIOD,
DURING WHICH THEIR RESEARCH EMPHASIZED MARINE BIOLOGY
AND GEOLOGY. THIS WAS TWICE AS LONG AS MEN HAD
PREVIOUSLY LIVED UNDER SATURATED DIVING CONDITIONS
AND THE ONLY SUCH EXPERIMENT TO USE A CONTROLLED
NITROGEN/OXYGEN ATMOSPHERE WITH A NORMAL 0.2-
ATMOSPHERE OXYGEN PARTIAL PRESSURE. THROUGH
CONTINUAL TELEVISION AND AUDITORY MONITORING, MEDICAL
DOCTORS, PSYCHOLOGISTS, AND DIVING ENGINEERS STUDIED
THE AQUANAUTS' BIOMEDICAL RESPONSES TO THE 60-DAY
SATURATION DIVE AND THEIR BEHAVIORAL AND OTHER
PSYCHOLOGICAL RESPONSES TO EACH OTHER, TO THEIR WORK,
AND TO THEIR ISOLATED, HOSTILE ENVIRONMENT.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-702 781 6/19 6/11
BIOTECHNOLOGY INC FALLS CHURCH VA

HUMAN PERFORMANCE IN THE UNDERSEA ENVIRONMENT: AN
ANNOTATED BIBLIOGRAPHY. (U)

JAN 76 90P REILLY, RAYMOND E. ;
CONTRACT: N00014-70-C-0052

UNCLASSIFIED REPORT

DESCRIPTIONS: (DEEP SUBMERGENCE, BIBLIOGRAPHIES),
(PERFORMANCE(HUMAN), UNDERWATER, LIFE
SUPPORT, ABSTRACTS, UNDERWATER COMMUNICATION
SYSTEMS, HEARING, HUMAN ENGINEERING, UNDERWATER
NAVIGATION, DIVING, DECOMPRESSION SICKNESS,
PERCEPTION(PSYCHOLOGY), VISION, PERSONALITY,
SCUBA DIVERS, UNDERWATER VEHICLES (U)

THE REPORT IS AN ANNOTATED BIBLIOGRAPHY OF 149
REFERENCES CONCERNING HUMAN PERFORMANCE AND
PHYSIOLOGY IN THE UNDERSEA AND DRY HYPERBARIC
ENVIRONMENT. ALSO INCLUDED ARE LISTS OF ADDITIONAL
BIBLIOGRAPHIES AND SCIENTISTS ENGAGED IN UNDERSEA
RESEARCH. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-703 610 6/19
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPETITIVE EXCURSION DIVES FROM SATURATED DEPTHS ON
HELIUM-OXYGEN MIXTURES. PHASE I: SATURATION
DEPTH 350 FEET. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,
MAR 70 SJP SUMMITT, JAMES K. ; HERRON,
JERRY M. ; FLYNN, EDWARD I. ;
REPT. NO. NEDU-RR-2-70

Reproduced from
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UNCLASSIFIED REPORT
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

DESCRIPTORS: (*DEEP SUBMERGENCE, DIVING),
(*DIVING, STANDARDS), (*DECOMPRESSION SICKNESS,
DIVING), PERFORMANCE(HUMAN), HELIUM GROUP
GASES, TISSUES(BIOLOGY), HEARING,
JOINTS(PHYSIOLOGY), HELIUM, TEST FACILITIES (U)
IDENTIFIERS: *DEEP DIVING REPETITIVE EXCURSION
TABLES, *SATURATION DIVING, *EXCURSION DIVING (U)

FIVE 350 FOOT SATURATION DIVES WERE CONDUCTED AT
THE NAVY EXPERIMENTAL DIVING UNIT TO VERIFY A
NO-DECOMPRESSION, REPETITIVE EXCURSION FORMAT
DEVELOPED BY DSSP (PM-11). TWENTY DIVERS
COMPLETED A TOTAL OF 344 MAN-EXCURSION DIVES FROM THE
SATURATION DEPTH. NO SYMPTOMS OF DECOMPRESSION
SICKNESS WERE REPORTED DURING THE EXCURSION DIVES,
DURING THE BOTTOM TIME AT 350 FEET OR DURING THE
FIRST 200 FEET OF DECOMPRESSION BACK TO THE SURFACE.
FIVE CASES OF DECOMPRESSION SICKNESS DID OCCUR
DURING THE LATTER STAGES OF DECOMPRESSION AND THEY
ARE DISCUSSED BRIEFLY. THE OCCURANCE OF
COMPRESSION ARTHRALGIA AND EXTERNAL OTITIS ON DEEP
SATURATION-EXCURSION DIVES IS ALSO DISCUSSED.
(AUTHOR) (U)

UNCLASSIFIED

DOL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-708 024 5/9
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE
MEDICAL RESEARCH LAB

CHARACTERISTICS OF THE SUBMARINE LINE OFFICER I.
A FACTOR ANALYTICAL STUDY OF THE OFFICER CANDIDATE
FOR THE SUBMARINE SERVICE. (U)

DESCRIPTIVE NOTE: INTERIM REPT.:
JAN 70 17P WEYBREN, BENJAMIN B. ;
REPT. NO. SMML-616
PROJ: HF12.524-002-9004
TASK: HF12.524-002-900405

UNCLASSIFIED REPORT

DESCRIPTIONS: (OFFICER PERSONNEL, SUBMARINE
PERSONNEL), FACTOR ANALYSIS,
PERFORMANCE (HUMAN), SELECTION,
PERSONALITY (U)

THE GOALS OF THE STUDY WERE TWOFOLD: (1) TO
IDENTIFY THE TRAIT CONFIGURATIONS CHARACTERIZING THE
DIFFERENT TYPES OF OFFICERS WHO VOLUNTEER FOR THE
SUBMARINE SERVICE; AND (2) TO INVESTIGATE
DIFFERENCES IN PERFORMANCE OF THE OFFICERS MAKING UP
EACH GROUP IDENTIFIED IN THIS MANNER. THIRTY-FIVE
ITEMS OF DATA, INCLUDING APTITUDE AND PERSONALITY
TESTS, SECTION LEADER RATINGS AND GRADES IN
SUBMARINE SCHOOL WERE OBTAINED FROM A SAMPLE OF
150 OFFICERS. A CENTROID FACTOR ANALYSIS DELINEATED
FIVE FACTORS, LABELED: F1 - TRAIT
CONFIGURATION OF AN IDEAL SUBMARINE OFFICER
CANDIDATE; F2 - GENERAL TEMPERAMENT
DIMENSION; F3 - SPECIAL APTITUDES; F4 -
POLITICO-ECONOMIC INTERESTS, AND F5 -
FOCUSED THEORETICAL INTERESTS. ONLY THOSE
OFFICERS WHO OBTAIN HIGH SCORES IN F1 AND F3
RECEIVE COMPARABLY HIGH GRADES IN BASIC SUBMARINE
SCHOOL. A DETAILED DISCUSSION OF THE STRUCTURE
OF EACH FACTOR IS PRESENTED. (AUTHOR) (U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-708 680 6/17 13/1
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SEALAB III - DIVER'S ISOTOPIC SWIMSUIT-HEATER
SYSTEM.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
MAY 70 120P BAYLES, JOHN J. TAYLOR,
DOUGLAS;

REPT. NO. NCEL-TN-1087
PROJ: NCEL-64-005

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UNCLASSIFIED REPORT

DESCRIPTORS: (•UNDERWATER CLOTHING, •HEATING
ELEMENTS), DIVING, PLUTONIUM, RADIOACTIVE
ISOTOPES, PLASTICS, PIPES, PUMPS, HYDROSTATIC
PRESSURE, PROTECTION, ENVIRONMENTAL TESTS,
RELIABILITY, SPECIFICATIONS (U)
IDENTIFIERS: •SEALAB 3, BACKPACKS, •RADIOISOTOPE
HEAT SOURCES (U)

THE ATOMIC ENERGY COMMISSION AND THE DEEP
SUBMERGENCE SYSTEMS PROJECT OFFICE INCLUDED
THE DEVELOPMENT AND EVALUATION OF AN ISOTOPIC
SWIMSUIT HEATING SYSTEM IN THE SEALAB III PROGRAM
TO DEMONSTRATE A USE OF ATOMIC ENERGY AS A METHOD FOR
PROVIDING SUPPLEMENTAL HEAT TO DIVERS. THE TASK OF
DEVELOPING A SWIMSUIT HEATING 'PACKAGE' WAS ASSIGNED
TO THE NAVAL CIVIL ENGINEERING LABORATORY,
PORT HUENEME, CALIFORNIA. THE 'PACKAGE'
UTILIZES AEC FURNISHED PLUTONIUM 238 CAPSULES FOR
HEATING WATER WHICH IS PUMPED THROUGH A CLOSED-CYCLE
SYSTEM INCLUDING A DIVER'S UNDERGARMENT FITTED WITH
CLOSELY SPACED PLASTIC TUBING. THE DIVER WEARS A
WET SUIT OVER THIS UNDERGARMENT TO AID IN RETAINING
THE HEAT PROVIDED. THE 'PACKAGE' OR ISOTOPE
BACKPACK SEGMENT IS DESIGNED TO BE ATTACHED TO A
MODIFIED MARK VIII MIXED GAS BREATHING APPARATUS
BACKPACK. THE SPECIFICATIONS BASED UPON AVAILABLE
INFORMATION AT THE TIME OF INITIAL DEVELOPMENT
STAGES, DID NOT PROVIDE FOR SUFFICIENT ISOTOPE TO
PRODUCE ADEQUATE SUPPLEMENTAL HEAT. HOWEVER, THE
FINAL BACKPACK DESIGN DID NOT MATERIALLY AFFECT THE
DIVER'S CAPABILITIES AND THE SYSTEM WAS SUCCESSFULLY
TESTED WITH RESPECT TO ITS DESIGN OPERATIONAL
CHARACTERISTICS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-704 141 13/10 5/9
NAVAL PERSONNEL RESEARCH AND DEVELOPMENT LAB WASHINGTON D
C

PERSONNEL AND TRAINING REQUIREMENTS FOR THE ASR-21
RESCUE CONTROL CENTER. (U)

DESCRIPTIVE NOTE: PRELIMINARY REPT. JAN-OCT 69,
JUN 70 34P DELUCA, JOSEPH F. INOBLE,
JOHN F. ;
REPT. NO. WRN-70-9

UNCLASSIFIED REPORT

DESCRIPTORS: (•UNDERWATER VEHICLES, SEA RESCUES),
(•NAVAL TRAINING, DEEP SUBMERGENCE), SUBMARINE
ESCAPE, CATAMARANS, SONAR PERSONNEL, MAINTENANCE
PERSONNEL, CONTROL SYSTEMS, TRACKING, COMPUTER
PERSONNEL, DATA PROCESSING SYSTEMS, SONAR EQUIPMENT,
PROGRAMMED INSTRUCTION, VIEWING SCREENS (U)
IDENTIFIERS: ASR-21 VESSEL, DEEP SUBMERGENCE
RESCUE VEHICLES (U)

THE REPORT CONCERNS ITSELF WITH THE IDENTIFICATION
OF PERSONNEL AND TRAINING REQUIREMENTS FOR THE
RESCUE CONTROL CENTER (RCC), ASR-21
CLASS. INFORMATION IN THIS REPORT WILL BE
UTILIZED IN ESTABLISHING INITIAL TRAINING COURSES AND
THE INITIAL TRAINING SITE FOR ASR-21 AND ASR-22
PERSONNEL. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-704 393 13/10
ASSOCIATION OF SENIOR ENGINEERS (NAVSHIPS) WASHINGTON D
C

1970 ANNUAL TECHNICAL SYMPOSIUM (7TH).
MECHANICAL SYSTEMS FOR OCEAN ENGINEERING, (U)

70 58P SOUTHERLAND, ARTHUR, JR.

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE: ERRATA SHEET INSERTED.

DESCRIPTORS: (UNDERWATER VEHICLES, RECOVERY),
DEEP SUBMERGENCE, STABILIZED PLATFORMS, TEST
EQUIPMENT, CONTROL SYSTEMS, UNDERWATER EQUIPMENT,
PAYLOAD, CABLES (MECHANICAL), HANDLING,
DIVING, CONFIGURATION, SEA RESCUE EQUIPMENT,
RESCUES, SUBMARINES, HYDRAULIC SERVOMECHANISMS (U)
IDENTIFIERS: ALVIN VESSEL (U)

THE PAPER DISCUSSES MECHANICAL HANDLING SYSTEMS
DESIGN CONSIDERATIONS, PERFORMANCE REQUIREMENTS AND
PROBLEM AREAS ASSOCIATED WITH SALVAGE AND RESCUE
OPERATIONS INCLUDING HANDLING OF SUBMERSIBLE VEHICLES
AND OTHER LARGE OBJECTS AT SEA. SHIP MOTION
RESPONSE TO VARIOUS SEA CONDITIONS AND THE
CAPABILITIES AND LIMITATIONS OF PRESENT HANDLING
METHODS ARE EVALUATED. EMPHASIS IS PLACED ON THE
EFFECT OF DYNAMIC LOADS IMPOSED ON THE HANDLING GEAR
AND METHODS OF LOAD ATTENUATION AND MOTION
COMPENSATION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-704 423 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SALVAGE BUREAU PROJECTS-SEALAB III. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. JAN 67-JUN 69,
JUL 70 1969 DAYLES, JOHN J. ;

REPT. NO. NCEL-TH-684

PROJ: NCEL-56-007

UNCLASSIFIED REPORT

DESCRIPTORS: (MARINE ENGINEERING, SALVAGE),
(SALVAGE, UNDERWATER VEHICLES), LIFT,
BUOYANCY, FLOATS, PNEUMATIC SYSTEMS, UNDERWATER
LIGHTS, LOGISTICS, DIVING, HUMAN ENGINEERING (U)
IDENTIFIERS: SEALAB 3 VESSEL, MANNED
SUBMERSIBLES (U)

THE SEALAB III PROGRAM, UNDER THE DIRECTION OF
THE OCEAN ENGINEERING BRANCH, DEEP
SUBMERGENCE SYSTEMS PROJECT OFFICE, WAS
INITIATED TO ADVANCE THE STATE-OF-THE-ART OF MAN'S
CAPABILITY TO LIVE AND WORK IN THE DEEP OCEAN
ENVIRONMENT. IT IS THE GOAL OF THE SALVAGE
PROJECTS FOR SEALAB III TO DEMONSTRATE AND FIELD
TEST SOME OF THE MORE IMPORTANT NEW SALVAGE DEVICES
AND TECHNIQUES. THIS REPORT DISCUSSES THE AQUANAUT
FAMILIARIZATION AND TRAINING PHASES ASSOCIATED WITH
THE SALVAGE PROJECTS PLANNED FOR TEAM TWO--
SEALAB III, AND THE MODIFICATIONS TO BOTH
EQUIPMENTS AND PROCEDURES AS SUGGESTED BY THE DIVERS.
PRELIMINARY RESULTS ARE INCLUDED WITH
RECOMMENDATIONS REGARDING FUTURE PLANS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-710 348 6/19
CALIFORNIA UNIV LOS ANGELES SCHOOL OF ENGINEERING AND
APPLIED SCIENCE

UNDERWATER WORK MEASUREMENT TECHNIQUES 1969
STUDIES.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUL 70 SUP WELTMAN, GERSHON IEGSTROM,
GLEN M. SCHUURS, THOMAS P. CHRISTIANSON,
RAYMOND A. I
REPT. NO. UCLA-ENG-7052
CONTRACT: N00014-69-A-0200-4025
PROJ: NK-196-069

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UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ALSO AVAILABLE AS BIOTECHNOLOGY
LAB. TECHNICAL REPT NO. 48.

DESCRIPTORS: (*PERFORMANCE(HUMAN),
UNDERWATER), (*PERCEPTION,
STRESS(PSYCHOLOGY)), (*DIVING,
PERFORMANCE(HUMAN)), ERGOMETERS, PULSE RATE,
RESPIRATION, OXYGEN, SWIMMING (U)
IDENTIFIERS: *WORK MEASUREMENT, *UNDERWATER
PERFORMANCE, SEALAB J (U)

RESEARCH WORK FOCUSED ON QUESTIONS OF PERCEPTUAL
NARROWING DURING STRESS AND ON COMPLEX TASK
PERFORMANCE OF EXPERIENCED DIVERS UNDER ADVERSE OCEAN
CONDITIONS. WORK BEGUN ON COMPUTER HANDLING OF THE
SEALAB III SCENARIO WAS COMPLETED, AND SEVERAL
PUBLICATIONS PREPARED. (AUTHOR) (U)

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-713 147 6/14 5/10
MAN FACTORS INC SAN DIEGO CALIF

EFFECTS OF THE UNDERWATER ENVIRONMENT UPON WORK
EFFICIENCY OF DIVERS.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. MAR-AUG 70,
UCT 70 49P STHEIMER, IRVING ; TURNER, D.
P. NO. : VOLKMER, RENT ; GUERIN, D. ;
REPT. NO. MF1-70-117
CONTRACT: N00014-70-C-0169
PROJ: NK-146-070

UNCLASSIFIED REPORT

DESCRIPTIONS: (MOTOR REACTIONS, UNDERWATER),
(MEASURING, UNDERWATER), (DIVING,
PERFORMANCE (HUMAN)), LEARNING CURVES, MEMORY,
RESPIRATION, GASES, CONSUMPTION, PULSE RATE,
CONFINED ENVIRONMENTS

(U)

IDENTIFIERS: UNDERWATER ERGONOMICS, HEART
RATE

(U)

THE EFFECTS OF WORKING UNDERWATER UPON CERTAIN
HUMAN PERFORMANCE CHARACTERISTICS DURING THE
EXECUTION OF SPECIFIC COMPLEX TASKS WERE STUDIED.
THE TASKS EXAMINED WERE: A COMPLEX MAINTENANCE
TASK INVOLVING THE DISASSEMBLY AND REASSEMBLY OF A
WATER FILTRATION UNIT, AND THE EXECUTION OF A METAL
TASK INVOLVING THE PROCESSES OF NUMERICAL REASONING,
DIGIT MEMORY SPAN AND PATTERN PERCEPTION. THESE
TASKS WERE PERFORMED IN SELF-PACED FASHION AT A
WORKING DEPTH OF 33 FEET. DURING TEST SESSIONS
MEASURES WERE TAKEN OF BREATHING GAS CONSUMPTION
RATE, (LITERS/MIN. STPD, AIR), AS WELL AS TIME
AND ACCURACY MEASURES OF THE TASK PERFORMED.
(AU, HUM)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-713 395

6/11

BATTELLE MEMORIAL INST COLUMBUS OHIO COLUMBUS LABS

LOW-PRESSURE COMPRESSED AIR BREATHING SYSTEMS
STUDY. II. MARK V HELMET VENTILATION STUDIES.

(U)

DESCRIPTIVE NOTE: SUMMARY TECHNICAL REPT. 1 APR-1 AUG
70.

SEP 70 52P HENKENER, JERRY A. ;
CONTRACT: N00014-69-C-0352

UNCLASSIFIED REPORT

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DESCRIPTIONS: (LOW-PRESSURE RESEARCH, BREATHING
APPARATUS), (HELMETS, DIVING), (DIVING,
BREATHING APPARATUS), UNDERWATER CLOTHING,
VENTILATION, CARBON DIOXIDE, EFFECTIVENESS,
RESPIRATION, EXPERIMENTAL DATA, PRESSURE
BREATHING

(U)

IDENTIFIERS: MARK-V HELMETS, DIVING HELMETS,
LOW PRESSURE BREATHING APPARATUS

(U)

THIS REPORT PRESENTS EXPERIMENTAL RESULTS OF A
TESTING PROGRAM FOR DETERMINING MIXING EFFECTIVENESS
FACIORS AND REQUIRED VENTILATION RATES FOR U. S.
NAVY MARK V DIVING HELMETS. BASED UPON THE
EXPERIMENTAL RESULTS AND DATA THE FOLLOWING ARE
CONCLUDED: PREVIOUS VENTILATION CALCULATIONS
BASED ON A MIXING EFFECTIVENESS FACTOR OF 1.0 WERE
CONSERVATIVE; A DATA BASE WAS OBTAINED TO MORE
ACCURATELY PREDICT REQUIRED VENTILATION RATES FOR
HARD HAT DIVING; THE DATA BASE FOR THE MARK V
SHOULD PROVE TO BE A VALUABLE TOOL FOR COMPARING THE
EFFECTIVENESS OF OTHER VENTILATED HELMETS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-715 344 5/10 6/19
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

MEMORY IMPAIRMENT DURING A DEEP HELIUM
DIVE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
70 0P GIERSEN, ROBERT J. CAMERON,
BERNARD J. ;
REPT. NO. NEDU-RK-13-70
PROJ: H4300-G1-10040

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V41 NO
P656-661 JUN 70.

DESCRIPTORS: (DIVING, MEMORY),
(STRESS(PSYCHOLOGY), DIVING),
(STRESS(PHYSIOLOGY), DIVING), UNDERWATER,
ENVIRONMENT, HELIUM, NARCOTICS,
PERFORMANCE(HUMAN)

(U)

IDENTIFIERS: HYPERBARIC ATMOSPHERES, HELIUM
ATMOSPHERES

(U)

TWENTY DIVERS PERFORMED AN ASSOCIATIVE MEMORY TASK
AT THREE INTERVALS DURING A SATURATION DIVE: ONCE AT
THE SURFACE, A SECOND TIME AT A DEPTH OF 600 FEET,
AND A THIRD TIME DURING ASCENT AT 100 FEET. MEMORY
TESTED AFTER A 60 MINUTE DELAY AT 600 FEET WAS
SIGNIFICANTLY POORER THAN 60 MINUTE MEMORY TESTED ON
THE SURFACE OR AT 100 FEET. IT WAS CONCLUDED THAT
THE SELECTIVE IMPAIRMENT RESULTED FROM PSYCHOLOGICAL
STRESS RATHER THAN HELIUM NARCOSIS, SINCE 5 MINUTE
MEMORY WAS NOT IMPAIRED AT 600 FEET, AND 60 MINUTE
MEMORY REMAINED COMPLETELY INTACT IN SEVERAL
INSTANCES. THIS STUDY PROVIDES EVIDENCE SUGGESTING
THAT PSYCHOLOGICAL STRESS MAY BE AN IMPORTANT FACTOR
IN INFLUENCING PERFORMANCE AT EXTREME DEPTHS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-715 671 5/9 5/10
BIOMARINE INDUSTRIES INC DEVON PA

A STUDY OF DIVER PERFORMANCE WITH
COMMUNICATION AIDS.

(U)

DESCRIPTIVE NOTE: REPT. FOR 1 FEB-30 SEP 70 ON PHASE
1,

OCT 70 61P THOMPSON, BRENDAN P. ;
THOMPSON, CARL L. ;
REPT. NO. UWCP-70-3
CONTRACT: N00014-70-C-0162

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UNCLASSIFIED REPORT

DESCRIPTORS: (*DIVING, PERFORMANCE(HUMAN)),
(*UNDERWATER COMMUNICATION SYSTEMS, *VOICE
COMMUNICATION SYSTEMS), TRAINING
IDENTIFIERS: *DIVERS, Tektite 2 PROJECT

(U)

(U)

AN EVALUATION OF THE PERFORMANCE OF A DIVER WITH
COMMUNICATION WAS ATTEMPTED IN TWO EXPERIMENTS. THE
MAJOR EXPERIMENT INVOLVED THE OBSERVATION OF THE USE
OF UNDERWATER COMMUNICATORS BY SATURATED SCIENTIFIC
DIVERS ON THE TEKTITE II PROGRAM. THE SECONDARY
EXPERIMENT INVOLVED THE EXAMINATION OF COMMUNICATIONS
WITH CLOSED CYCLE DIVING EQUIPMENT. DATA ON
SATURATED DIVERS, THOUGH NOT EXTENSIVE, SHOWED THAT
COMMUNICATION EQUIPMENT PERFORMANCE AND TRAINING WERE
PRIMARY FACTORS IN INFLUENCING DIVER PERFORMANCE.
COMMUNICATIONS WITH CLOSED CYCLE EQUIPMENT SHOWED A
CONSIDERABLE QUALITATIVE IMPROVEMENT AS COMPARED TO
OPEN CYCLE EQUIPMENT, DUE TO LACK OF EXHAUST GAS
INTERFERENCE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-716 414 5/9 13/10
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

SEA STATES AND SHIPBOARD OPERATOR
PERFORMANCE AND MAINTENANCE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 76 60P LACEY, LYNN A. :
REPT. NO. SRM-71-5

UNCLASSIFIED REPORT

DESCRIPTORS: (*PERFORMANCE(HUMAN), SHIPBORNE),
(*OCEAN WAVES, PERFORMANCE(HUMAN)), MOTION,
MOTION SICKNESS, ATTRITION, RADAR OPERATORS,
RADIO OPERATORS, SONAR PERSONNEL, SHIPS,
ELECTRONIC EQUIPMENT, ATTITUDES, QUESTIONNAIRES,
STABILIZATION, MARINE ENGINEERING
IDENTIFIERS: *SHIP CREWMEMBERS, *SEA STATES,
SEMI-SUBMERGED SHIPS, ROUGH SEAS

(U)

(U)

THE PURPOSE OF THE RESEARCH IS TO EVALUATE THE EFFECTS OF SEA STATES ON THE OPERATION AND MAINTENANCE OF RADAR, RADIO, AND SONAR SHIPBOARD EQUIPMENT. LITTLE RESEARCH HAS BEEN CONDUCTED ON THE EFFECTS OF SEA STATE CONDITIONS ON THE OPERATION AND MAINTENANCE OF SHIPBOARD EQUIPMENT. THE PRESENT RESEARCH EXTENDS THE AVAILABLE DATA ON THE EFFECTS OF SEA STATES. OPERATION AND MAINTENANCE EVALUATION QUESTIONNAIRES, REQUIRING EVALUATION OF THE EFFECTS OF SEA STATES, WERE ADMINISTERED TO STUDENTS AND INSTRUCTORS AT CLASS B AND C SCHOOLS. BOTH OPERATOR AND MAINTAINER PERFORMANCE ARE REPORTED TO BE HINDERED AT HIGH SEA STATES, BUT MOST SHIP OPERATING TIME IS AT LOW SEA STATES. EQUIPMENT PERFORMANCE IS REPORTED TO BE MORE GREATLY HINDERED AT HIGHER SEA STATES THAN AT LOWER SEA STATES. A GREATER AMOUNT OF EQUIPMENT MAINTENANCE IS REPORTED TO BE REQUIRED AT HIGHER SEA STATES THAN AT LOWER SEA STATES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK2J

AD-716 532 5/5 13/10
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV
CAPABILITIES OF OPERATORS AS DIVERS VS
SUBMERSIBLE MANIPULATOR CONTROLLERS IN
UNDERSEA TASKS. (U)

JUN 70 112P PESCH, ALAN J. HILL, ROBERT
G. KLEPSE, WILLIAM F., JR;
REPT. NO. U417-70-043
CONTRACT: N00014-69-C-0168
PROJ: NK-196-090

UNCLASSIFIED REPORT

DESCRIPTIONS: (SCUBA DIVERS,
PERFORMANCE (HUMAN)), (UNDERWATER VEHICLES,
AUTOMATION), (SALVAGE, EFFECTIVENESS), COST
EFFECTIVENESS, TIME, STATISTICAL PROCESSES,
CORRELATION TECHNIQUES, TEST METHODS, SIMULATION,
AIR, UNDERWATER, REMOTE CONTROL SYSTEMS,
HANDS (U)
IDENTIFIERS: EVALUATION, COMPARISON,
MANIPULATORS, UNDERWATER TASKS (U)

THE MAJOR OBJECTIVE OF THE RESEARCH PROGRAM WAS TO
ANALYZE, EMPIRICALLY EVALUATE, AND QUANTIFY THE
CAPABILITIES OF THE HUMAN OPERATOR TO PERFORM APPLIED
UNDERSEA WORK TASKS AS A DIVER, IN COMPARISON TO HIS
ROLE AS THE OPERATOR OF A MANIPULATOR-EQUIPPED SMALL
SUBMERSIBLE. EXPERIMENTAL DATA WAS COLLECTED
UTILIZING A SMALL SUBMERSIBLE MUCKUP WITH AN ACTUAL
VIEWPORT LOOKING INTO A WATER-FILLED TANK IN WHICH A
MANIPULATOR AND TASK WERE LOCATED. THE EXPERIMENT
CONSISTED OF TYPICAL APPLIED SALVAGE TASKS SUCH AS
SAMPLE COLLECTING, RIGGING AND HOOKING, VALVE
TURNING, CONNECTING AND DISCONNECTING A HANSEN
QUICK DISCONNECT, DRILLING, TAPPING, THREADING, AND
UNBOLTING. PERFORMANCE MEASURES WERE TAKEN FOR EACH
OF THE TASKS AND THE BEHAVIORAL SEGMENTS WITHIN THE
TASKS. THE WORK SYSTEMS UNDER STUDY INCLUDED
DIVERS AND VARIOUS MANIPULATOR CONTROL SYSTEMS
(JOYSTICK, VARIABLE RATE; JOYSTICK, FIXED RATE; AND
PUSHBUTTON, FIXED RATE). (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-717 66J 6/1Y
OFFICE OF NAVAL RESEARCH ARLINGTON VA

PRINCIPLES AND OBSERVATIONS ON THE PHYSIOLOGY
OF THE SCUBA DIVER, (PRINCIPI ED OSSERVAZIONI
DI FISILOGIA DEL SUMMOZZATURE),

(U)

7U 33YP ALBANO, GASPAKE I
REPT. NO. JNN-DR-150

UNCLASSIFIED REPORT

AVAILABILITY: PAPER COPY AVAILABLE FROM
SUPERINTENDENT OF DOCUMENTS, GPO, WASHINGTON, D.
C. 20402. ORDER AS: D210-15:DR-150. PRICE:
\$2.50.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
INTERNATIONAL LABORATORY FOR UNDERWATER MEDICINE,
PALERMO (ITALY).

DESCRIPTORS: (•STRESS(PHYSIOLOGY), •DIVING),
PHYSIOLOGY, UNDERWATER, ENVIRONMENT,
PERFORMANCE(HUMAN), BODY TEMPERATURE,
RESPIRATION, HIGH-PRESSURE RESEARCH,
CARDIOVASCULAR SYSTEM, DECOMPRESSION SICKNESS,
PRESSURE BREATHING, OXYGEN, NERVOUS SYSTEM,
NERVOUS SYSTEM DISEASES, PATHOLOGY, ITALY
IDENTIFIERS: TRANSLATIONS, HYPERBARIC ATMOSPHERES,
HYPERBARIC OXYGENATION, •UNDERWATER SWIMMERS

(U)

(U)

CONTENTS: DIRECT EFFECTS OF UNDERWATER
ENVIRONMENT ON THE BODY AND ON CONDITIONS OF
UNDERWATER WORK; THE HYPERBARIC HUMORAL SYNDROME;
THERMOREGULATION AND THE DIVER'S ENERGY NEEDS;
HYPERBARIC RESPIRATION; THE HYPERBARIC
CARDIOVASCULAR SYNDROME; NEUROPSYCHIC FUNCTIONS
DURING HYPERBARIC BREATHING OF SEVERAL MIXTURES;
THE PROBLEM OF DECOMPRESSION; MIXTURES,
APPARATUS, AND DECOMPRESSION PRACTICE; PHYSIOLOGY
OF SKIN DIVING.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD#717 961 13/9 S/S 13/10
OCEANAUTICS INC SAN DIEGO CALIF

HUMAN ENGINEERING CRITERIA FOR THE DESIGN OF
DIVER-OPERATED UNDERWATER TOOLS. (U)

DESCRIPTIVE NOTE: ANNUAL SUMMARY REPT., OCT 69-SEP 70,
JAN 71 79P ANDERSEN, BIRGER G. ;
REPT. NO. CI-TR-71/1-SK
CONTRACT: N00014-70-C-0070
PROJ: NR-196-095

UNCLASSIFIED REPORT

DESCRIPTORS: (*SMALL TOOLS, DESIGN), (*HUMAN
ENGINEERING, UNDERWATER EQUIPMENT), (*UNDERWATER
EQUIPMENT, SMALL TOOLS), TORQUE, STANDARDS,
SCREWDRIVERS, IMPACT WRENCHES, PERFORMANCE TESTS,
DIVING (U)
IDENTIFIERS: NUTRUNNERS, *HAND TORQUEING TOOLS,
HAND WRENCHES, UNDERWATER TASKS (U)

THE REPORT SUMMARIZES THE RESULTS OF A RESEARCH
STUDY CONDUCTED TO DEVELOP A USER-ORIENTED DESIGN
CRITERIA GUIDE FOR DIVER-OPERATED UNDERWATER TOOLS.
THE TOOLS COVERED IN THIS PHASE OF THE STUDY WERE
LIMITED TO THE CATEGORY OF TOOLS USED IN THE
PERFORMANCE OF TORQUEING TASKS. THE RATIONALE FOR
THE DEVELOPMENT OF DESIGN CRITERIA IS PRESENTED FOR
THOSE HAND AND POWER OPERATED TORQUEING TOOLS USED BY
MILITARY AND COMMERCIAL DIVERS IN THE SUPPORT OF
UNDERWATER CONSTRUCTION AND SALVAGE OPERATIONS. THE
TOOL ITEMS STUDIED INCLUDE SCREWDRIVERS, NUTRUNNERS,
HAND WRENCHES, AND PNEUMATIC AND HYDRAULIC POWERED
IMPACT WRENCHES. THE APPLICATIONS OF SPECIFIC TOOL
ITEMS ARE DISCUSSED IN RELATION TO THE PERFORMANCE OF
OPERATIONAL UNDERWATER WORK TASKS. DESIGN CRITERIA
ARE PRESENTED, BASED ON DIRECT OBSERVATION AND
PARTICIPATION IN UNDERWATER TOOL OPERATIONS,
AVAILABLE TOOL PERFORMANCE DATA, APPLICABLE HUMAN
ENGINEERING RESEARCH DATA, AND THE OPERATIONAL
EXPERIENCE OF COMMERCIAL AND MILITARY DIVERS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD#710 413 5/10
ARIZONA STATE UNIV TEMPE

SYSTEMS ANALYSIS AND MODELING OF SMALL
GROUPS: ISOLATION AND SEALAB.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 OCT 62-31

MAR 63.

MAR 68 13P GACHRACH, ARTHUR J. ;

REPT. NO. U201071

CONTRACT: N0001-2/94(U3)

PROJ: MR-171-143

UNCLASSIFIED REPORT

DESCRIPTORS: (GROUP DYNAMICS, MATHEMATICAL
MODELS), (CONFINED ENVIRONMENTS, GROUP
DYNAMICS), VERBAL BEHAVIOR, GROUP DYNAMICS,
PERFORMANCE (HUMAN), GAME THEORY,
STRESS (PSYCHOLOGY), DATA PROCESSING SYSTEMS,
UNDERWATER VEHICLES

(U)

IDENTIFIERS: MANNED SUBMERIBLES, SYSTEMS
ANALYSIS, REINFORCEMENT (PSYCHOLOGY), STIMULUS
CONTROL, ISOLATION, SEALAB 2,
CONFINEMENT (PSYCHOLOGY)

(U)

MUCH OF THE RESEARCH ACCOMPLISHED WAS CONTINUATION
AND EXPANSION OF WORK IN EXPERIMENTAL ANALYSIS OF
BEHAVIOR UNDER A PREVIOUS CONTRACT AT THE
UNIVERSITY OF VIRGINIA. EARLY RESEARCH AT
ASU WAS DIRECTED TOWARD DEVELOPING STABLE BASELINES
AND STIMULUS CONTROL TECHNIQUES TO ANALYZE GROUP
PHENOMENA FROM AN EXPERIMENTAL STANDPOINT. IN THE
SECOND YEAR THE INVESTIGATORS STARTED TO DIRECT
ATTENTION OF THE PAY-OFF MATRICES AS DESCRIBED IN
GAME THEORY TO REINFORCEMENT AND REINFORCEMENT VALUE,
WHICH IN TURN, LED TO MORE EXTENSIVE EXPLORATION OF
THE AREA OF COMPETITION. ENSUING YEARS WERE
DEVOTED TO AN INVESTIGATION OF SPECIFIC GROUP
PHENOMENA SUCH AS COMPETING CONTINGENCIES, AGAIN
WITHIN THE MATRIX OF GAME THEORY, WHICH INDICATED
THAT THERE WAS A THREE-FOLD FUSION OF GAME THEORY
ORIENTATION WITH PAY-OFF MATRICES AS A QUANTITATIVE
METHOD OF ESTABLISHING VALUE AND OPERANT CONDITIONING
TECHNIQUES. THIS LED TO EXPLORATION OF SYSTEMS
ANALYSIS AS A MEANS OF ANALYZING CONDITIONING
PROCEDURES IN GROUP EVENTS. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-716 455 6/7 13/10-1 5/5
NAVAL SUBMARINE MEDICAL CENTER GROTON CONN SUBMARINE
MEDICAL RESEARCH LAB

HUMAN FACTORS EVALUATION OF SUBMARINE
ESCAPE: 1A. INDIVIDUAL AND GROUP ESCAPE
WITH THE BRITISH SUBMARINE ESCAPE IMMERSION
SUIT AND THE STEINKE HOOD UNDER CONDITIONS
OF SIDE AND TUBE EGRESS. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,
APR 70 28P HYACK, BERNARD L.; RODENSKY,
ROBERT L.; WALTERS, GARY B.;
REPT. NO. SMRL-624
PROJ: MR12-524-006
MONITOR: NAVMED MR12-524-006-90258-36

UNCLASSIFIED REPORT

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DESCRIPTORS: (*SUBMARINE ESCAPE; HUMAN
ENGINEERING); DECOMPRESSION SICKNESS; TIME;
CORRELATION TECHNIQUES; REGRESSION ANALYSIS;
MATCHES; SUBMARINE PERSONNEL; SEA RESCUE
EQUIPMENT (U)
IDENTIFIERS: MARK 7 SUBMARINE ESCAPE SUITS;
STEINKE HOODS; SUBMARINE ESCAPE APPLICANCE;
*SUBMARINE ESCAPE SUITS (U)

THE COMPATIBILITY OF THE BRITISH MARK VII
SUBMARINE ESCAPE IMMERSION SUIT (SEIS) WITH
SIDE EGRESS AND TUBE EGRESS UNITED STATES NAVY
ESCAPE TRUNK CONFIGURATIONS WAS EVALUATED. EGRESS
TIME WITH THE SEIS WAS COMPARED TO THAT WITH THE
STEINKE HOOD UNDER CONDITIONS OF INDIVIDUAL AND
GROUP ESCAPE (1, 2, AND 3 MAN TEAMS).
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-72U 976 5/5 5/6 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

HUMAN FACTORS ENGINEERING. (U)

DESCRIPTIVE NOTE: MATERIEL TEST PROCEDURE.

AUG 67 7UP
REPT. NO. HTP-6-2-502

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN ENGINEERING, TEST METHODS),
(MAN-MACHINE SYSTEMS, HUMAN ENGINEERING),
DISPLAY SYSTEMS, CONTROL PANELS, WARNING SYSTEMS,
AUDITORY PERCEPTION (U)
IDENTIFIERS: COMMON ENGINEERING TEST PROCEDURES,
AUDITORY WARNING DEVICES, VISUAL DISPLAYS (U)

THE OBJECTIVE OF THE MATERIEL TEST PROCEDURE
IS TO PROVIDE METHODS OF DETERMINING THE
APPROPRIATENESS AND EFFECTIVENESS OF HUMAN FACTORS
ASPECTS AT MAN MACHINE INTERFACES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-722 618 6/19
NAVY CLOTHING AND TEXTILE RESEARCH UNIT NATICK MASS

A METHOD FOR DETERMINING O₂ AND CO₂ FROM
TEST SUBJECTS WEARING SCUBA DIVING
EQUIPMENT UNDER WATER.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 71 1JP REINS, DALE A. ;
REPT. NO. TR-94

UNCLASSIFIED REPORT

DESCRIPTORS: (*RESPIRATION, *DIVING), (*OXYGEN
CONSUMPTION, DIVING), (*BREATHING APPARATUS,
DIVING), (*UNDERWATER EQUIPMENT, RESPIRATION),
METABOLISM, UNDERWATER CLOTHING, OXYGEN, CARBON
DIOXIDE, MEASUREMENT, CALORIMETRY

(U)

IDENTIFIERS: SCUBA DIVING EQUIPMENT

(U)

A METHOD IS DESCRIBED FOR DETERMINING OXYGEN
CONSUMPTION FOR INDIRECT CALORIMETRIC CALCULATION OF
METABOLIC CHANGES FOR MEN UNDER WATER WHILE USING
STANDARD SCUBA DIVING EQUIPMENT. CARBON DIOXIDE
IS ALSO MEASURED AND THE RESPIRATORY QUOTIENT (RQ)
OBTAINED GIVES CREDENCE TO THE ASSUMPTION THAT
MEASUREMENTS ARE VALID. MEAN RQ FROM 178
MEASUREMENTS WAS 0.8346 PLUS OR MINUS A STANDARD
ERROR OF THE MEAN OF .0062. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-723 174 6/14 13/10
ASTRO NAUTICAL RESEARCH INC CAMBRIDGE MASS

SATURATION DIVES, WITH EXCURSIONS, FOR THE
DEVELOPMENT OF A DECOMPRESSION SCHEDULE FOR
USE DURING SEALAB III.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT.,
SEP 70 68P KULIG, J. WAYNE ISUMMITT,
JAMES K. ;
CONTRACT: N00024-70-C-5559
MONITOR: NEDU NM-9-70

UNCLASSIFIED REPORT

DESCRIPTORS: (DIVING, PERFORMANCE (HUMAN)),
(DECOMPRESSION, SCHEDULING), (UNDERWATER
VEHICLES, DECOMPRESSION), DEEP SUBMERGENCE,
BREATHING APPARATUS, DECOMPRESSION SICKNESS,
HYDROSTATIC PRESSURE

(U)

IDENTIFIERS: SATURATION DIVING, SEALAB 3 MANNED
SUMMERSIDE, DECOMPRESSION SCHEDULES, MANNED
SUBMERSIBLES, SATURATION-EXCURSION DIVING, ASCENT
RATE

(U)

TWENTY-THREE SATURATION DIVES TO DEPTHS OF 200 TO
850 FEET WERE CONDUCTED AT THE US NAVY
EXPERIMENTAL DIVING UNIT TO VERIFY A
DECOMPRESSION SCHEDULE FOR USE AT SEALAB III.
SEVENTY-ONE DIVERS COMPLETED NINETY-SEVEN MAN-DIVES
AND TESTED DECOMPRESSION SCHEDULES BASED ON TWO
DIFFERENT FUNDAMENTAL RATES OF ASCENT DURING THE DIVE
SERIES. SEVENTY-FOUR MAN-EXCURSION DIVES WERE
CONDUCTED DURING THE SERIES, INCLUDING A RECORD-
BREAKING EXCURSION TO A DEPTH OF 1045 FEET. A
DECOMPRESSION SCHEDULE FOR USE FROM A DEPTH OF 600
FEET WAS DEVELOPED AND FOUND TO BE SAFE FOR USE
DURING SEALAB III. EIGHT CASES OF DECOMPRESSION
ILLNESS OCCURRED DURING THE DIVE SERIES. DETAILS
OF THESE CASES ARE COVERED IN THE REPORT.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-723 177 6/19

NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPORT OF EXPERIMENTAL DIVES FOR SEALAB III
SURFACE SUPPORT DECOMPRESSION SCHEDULES.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

DEC 70 120P

CHOWLEY, RICHARD W. ISUMMITT,

JAMES K. :

REPT. NO. NEOU-RK-15-70

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UNCLASSIFIED REPORT

DESCRIPTORS: (•DIVING, DECOMPRESSION),
(•DECOMPRESSION, SCHEDULING), (•UNDERWATER
VEHICLES, DECOMPRESSION), DECOMPRESSION SICKNESS,
BREATHING APPARATUS, SCUBA DIVERS, TABLES
IDENTIFIERS: SEALAB 3 MANNED SUBMERSIBLE,
•DECOMPRESSION SCHEDULES

(U)

(U)

THE REPORT DESCRIBES THE DECOMPRESSION SCHEDULES
THAT WERE DEVELOPED AND TESTED BY THE U.S. NAVY
EXPERIMENTAL DIVING UNIT (NAVXDIVINGU) IN
PREPARATION FOR SEALAB III. THE NEED WAS
FORESEEN FOR A SURFACE SUPPORTED DIVING CAPABILITY
FOR UNDERWATER TASKS OF RELATIVELY SHORT DURATION
WHICH WOULD NOT NECESSITATE THE USE OF SATURATION
DIVING WITH ITS RESULTING LONG DECOMPRESSION TIMES.
THE DECOMPRESSION SCHEDULES DESCRIBED IN THE REPORT
WERE DESIGNED TO PROVIDE THAT CAPABILITY. THE
REPORT PRESENTS EACH DEVELOPMENTAL DECOMPRESSION
SCHEDULE AND SUMMARIZES THE EXPERIMENTAL DIVES THAT
WERE MADE TO EVALUATE THEM. PROBLEMS ENCOUNTERED,
PARTICULARLY PROBLEMS OF DECOMPRESSION SICKNESS, ARE
ALSO SUMMARIZED. (AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD720 140 5/8
GENERAL DYNAMICS COMP GYROTOR CONN ELECTRIC BOAT DIV

MULTIPLE DISPLAY MONITORING. III.
TRACKING WHILE MONITORING.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAY 60 2JP KAUFMAN, HERBERT M. BLAIN,
WESLEY C. ;
REPT. NO. SP060-049, P60-014

UNCLASSIFIED REPORT

DESCRIPTORS: (TRACK-WHILE-SCAN,
PERFORMANCE (HUMAN)), (MAN-MACHINE SYSTEMS,
MONITORS), DISPLAY SYSTEMS, PERFORMANCE TESTS,
SUBMARINE PERSONNEL, TRACKING, CORRELATION
TECHNIQUES, AUTOMATION
IDENTIFIERS: PSYCHOMOTOR TASKS

(U)

(U)

THE STUDY IS THE THIRD IN A SERIES WHICH IS
CONCERNED WITH MAN AS A MONITOR. THESE STUDIES ARE
RELATED TO THE PROBLEMS ENCOUNTERED IN AUTOMATIC AND
SEMI-AUTOMATIC SYSTEMS, AND IN THE MODERN SUBMARINE IN
PARTICULAR, WHERE A MAN MUST DETECT AND CONTROL
INCOMING SIGNALS. THE STUDY WAS DESIGNED TO OBTAIN
PERFORMANCE MEASURES WHEN SS HAD A TWO-FOLD TASK,
THAT OF COMPENSATORY TRACKING ON ONE DISPLAY
(KEEPING A POINTER ON TARGET) WHILE MONITORING
TWO OTHER DISPLAYS FOR DISCRETE, STEADY-STATE
SIGNALS.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD726 161 13/9 5/9 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

TECHNICAL EVALUATION OF DIVER-HELD POWER
TOOLS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. NOV 68-JUN 70,
JUN 71 6UP BLACK, S. A. ;BARNETT, F.

B. I

REPT. NO. NCEL-TR-724

PROJ: (FJ8.535.003.01.002

UNCLASSIFIED REPORT

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DESCRIPTORS: (*SMALL TOOLS, UNDERWATER EQUIPMENT),
(*PERFORMANCE (HUMAN), UNDERWATER EQUIPMENT),
UNDERWATER CUTTING, SAWS, IMPACT WRENCHES,
GRINDERS, PNEUMATIC SYSTEMS, HYDRAULIC SYSTEMS,
SCUBA DIVERS, QUESTIONNAIRES, TIME STUDIES (U)
IDENTIFIERS: UNDERWATER MAINTENANCE, EVALUATION,
*UNDERWATER POWER TOOLS, *DIVERS, *IMPACT
TOOLS (U)

PNEUMATIC AND HYDRAULIC HAND-HELD POWER TOOLS WERE
EVALUATED BY DIVERS PERFORMING REALISTIC UNDERWATER
TASKS. THESE TASKS INCLUDED DRILLING STEEL AND
ALUMINUM, NUT RUNNING AND TIGHTENING, GRINDING METAL,
AND CHAIN SAWING WOOD. AN ON-THE-SITE OBSERVER
MONITORED DIVER PERFORMANCE TIME FOR EACH TASK.
DIVER SKILL IN EFFECTIVE TOOL UTILIZATION IS VERY
IMPORTANT IN WORKING UNDERWATER. AT TEST DEPTHS TO
60 FEET, HYDRAULIC TOOLS WERE VERY EFFECTIVE AND
PRACTICAL, WHILE PNEUMATIC TOOLS, ALTHOUGH EFFECTIVE,
REQUIRED EXCESSIVE MAINTENANCE. AT GREATER DEPTHS,
HYDRAULIC TOOLS RETAIN THEIR EFFECTIVENESS, BUT
PNEUMATIC TOOLS LOSE EFFECTIVENESS BECAUSE OF THE
COMPRESSIBILITY OF GAS. HYDRAULIC TOOLS GENERALLY
SUPPLY MORE ENERGY PER UNIT OF TOOL WEIGHT THAN DO
PNEUMATIC TOOLS; THUS, THE DIVER CAN PERFORM WORK
MORE RAPIDLY USING HYDRAULIC TOOLS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD-726 225 5/9 5/10 17/2
BIOMARINE INDUSTRIES INC DEVON PA

A STUDY OF DIVER PERFORMANCE WITH
COMMUNICATION AIDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 30 SEP 70-30 JUN 71 ON
PHASE 2.

JUN 71 S/P THOMPSON, BRENDAN P. ;
STREIMEN, IRVING R. ;
REPT. NO. UNCF-70-15
CONTRACT: N00014-70-C-0162
PROJ: NN-197-U06

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED OCT 70. AD-
715 871.

DESCRIPTORS: (•DIVING, PERFORMANCE(HUMAN));
(•UNDERWATER COMMUNICATION SYSTEMS, •VOICE
COMMUNICATION SYSTEMS), BREATHING APPARATUS,
HELIUM, OXYGEN

(U)

IDENTIFIERS: •DIVERS

(U)

THE PERFORMANCE OF TWO DIVERS WORKING AT 33 FT. ON
A COMMUNICATION DEPENDENT TASK WAS OBSERVED AND
MEASURED. COMPARISONS BETWEEN PRODUCTIVITY AND
ERROR GENERATION USING CLOSED AND OPEN CYCLE
BREATHING APPARATUS, AS WELL AS HELIUM/OXYGEN,
NITROGEN/OXYGEN AND ARGON/OXYGEN MIXTURES, WERE MADE.
MEASUREMENT OF OXYGEN UPTAKE AND CARBON DIOXIDE
PRODUCTION DURING THE COMMUNICATION TASK, AS WELL AS
FOR A SERIES OF CONSTANT SWIM RATES, WAS RECORDED.
NO SIGNIFICANT DIFFERENCE IN PRODUCTIVITY WAS NOTED
FOR ANY GAS MIXTURE OR BREATHING APPARATUS USED.
SIGNIFICANT DIFFERENCES WERE NOTED IN ERROR
GENERATION FOR THE HELIUM/OXYGEN MIXTURE. IN
ADDITION, THE DISTRIBUTION OF ERRORS BETWEEN SPECIFIC
LETTER-NUMBER PAIRS AND SOUND GROUPS DIFFERED
SIGNIFICANTLY FOR HELIUM/OXYGEN MIXTURES. OXYGEN
UPTAKE DURING THE COMMUNICATION TASK WAS EQUIVALENT
TO THAT PREVIOUSLY MEASURED FOR SELF-PACED WORK.
(AUMH)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD726 427 13/10 5/5
DUNLAP AND ASSOCIATES INC DARIEN CONN

STUDY. FEASIBILITY OF UNDERSEA SALVAGE
SIMULATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAY 71 95P BOWEN, H. H. ; MALE, ALLEN ;
CONTRACT: N61339-69-C-0116
MONITOR: NAVTRADEVLEN 69-C-0116-1

UNCLASSIFIED REPORT

DESCRIPTORS: (SALVAGE, UNDERWATER EQUIPMENT),
(HUMAN ENGINEERING, DIVING), REVIEWS,
SIMULATION, MILITARY PERSONNEL, UNDERWATER
VEHICLES, UNDERWATER CLOTHING, TRAINING, DEEP
WATER, LIFE SUPPORT
IDENTIFIERS: UNDERWATER SALVAGE

(U)

(U)

THE STUDY REVIEWS MAN'S INVOLVEMENT IN UNDERSEA
SALVAGE OPERATIONS AS CONDUCTED BY THE NAVY AND
DEFINES THE RELEVANT TRAINING REQUIREMENTS. NAVAL
SALVAGE SYSTEMS ARE MOBILIZED FROM SPECIALIZED
AND GENERAL PURPOSE EQUIPMENTS. THE CONFIGURATION
OF ANY SALVAGE SYSTEM IS DETERMINED BY THE SALVAGE
TASK. THERE ARE NO 'STANDING' SALVAGE SYSTEMS;
RATHER, THERE EXISTS A MULTIPLICITY OF COMPONENTS AND
PERSONNEL OF VARIOUS ABILITIES FROM WHICH AN AD HOC
SALVAGE SYSTEM IS MOBILIZED. DIVERS REPRESENT AN
IMPORTANT CAPABILITY. HOWEVER, THE WORK USEFULNESS
OF DIVERS IS ATTENUATED AT DEEPER DEPTHS AND BY THE
COMPLEXITY OF THE REQUIRED LIFE SUPPORT SYSTEMS AND
OTHER EQUIPMENT. ONE-ATMOSPHERE SUBMERSIBLES OFFER
AN ALTERNATIVE CAPABILITY. A CONSIDERABLE VARIETY
OF SURFACE SHIPS, SUBMERSIBLES, DIVING SYSTEMS AND
UNDERWATER TOOLS IS AVAILABLE. A DESCRIPTIVE MODEL
OF THE MOBILIZATION OF THESE RESOURCES AT A SALVAGE
SITE IS OFFERED. THE FOLLOWING RECOMMENDATIONS ARE
DERIVED FROM THIS DESCRIPTIVE MODEL: DIVERS MUST
BE TRAINED IN WATER; HENCE, TRAINING TANKS ARE
REQUIRED. SUITABLE FACILITIES ARE DESCRIBED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK2J

AD-726 711 1771 5/5
APPLIED PSYCHOLOGICAL SERVICES INC WAYNE PA SCIENCE
CENTER

SUMMARY OF HUMAN FACTORS IN SUPPORT OF
SONAR SYSTEM DEVELOPMENT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 15 SEP 67-15 JUL 71,
JUL 71 31P SIEGEL, ARTHUR I. ;
REPT. NO. 7172-1
CONTRACT: N00014-68-C-0104
PROJ: HR-196-078

UNCLASSIFIED REPORT

DESCRIPTORS: (SONAR EQUIPMENT, HUMAN
ENGINEERING), REVIEWS, DESIGN, DISPLAY SYSTEMS

(U)

THE REPORT IS PRESENTED IN TWO PARTS. THE FIRST
PART SUMMARIZES THE SONAR SYSTEM ORIENTED HUMAN
FACTORS WORK. PART II CONTAINS AN OUTLINE WHICH
CAN PROVIDE A BASIS FOR A SONAR SPECIFIC MANUAL OF
HUMAN FACTORS CONSIDERATIONS IN SONAR SYSTEM DESIGN,
DEVELOPMENT, AND TEST. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-726 741 5/10 17/1
HUMAN FACTORS RESEARCH INC GOLETA CALIF

OPERATOR TARGET DETECTION PERFORMANCE AS A
FUNCTION OF THE NUMBER OF SONAR ECHUES,
INTERVAL BETWEEN TRANSMISSIONS, AND SIGNAL-TO-
NOISE RATIO. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 71 20P ABRAMS, CHARLES ; DOOBENEN,
WILLIAM ; KERR, SALENA K. ; BUCKNER, DONALD N. ;
REPT. NO. 1700-1
CONTRACT: N00014-70-C-0186
PROJ: HR-196-097

UNCLASSIFIED REPORT

DESCRIPTORS: (1) SONAR PERSONNEL,
PERFORMANCE (HUMAN), (1) SONAR TARGETS,
DETECTION), SIGNAL-TO-NOISE RATIOS, ANALYSIS OF
VARIANCE, SONAR EQUIPMENT, DISPLAY SYSTEMS, HUMAN
ENGINEERING (U)

A MAJOR GOAL OF DESIGNERS OF ACTIVE SONAR SYSTEMS
IS TO OBTAIN LONGER TARGET DETECTION RANGES. ONE
CONSEQUENCE OF LONGER RANGES IS LONGER TIME INTERVALS
BETWEEN TRANSMISSIONS. ANOTHER IS LOWER SIGNAL-TO-
NOISE RATIOS AND THUS FEWER TRANSMISSIONS THAT
PRODUCE PERCEPTIBLE ECHUES FROM A TARGET. THE
PURPOSE OF THE STUDY WAS TO INVESTIGATE THE EFFECTS
OF THESE VARIABLES ON OPERATOR TARGET DETECTION
PERFORMANCE. THE RESULTS INDICATED THE
DESIRABILITY OF HISTORY OR MEMORY TYPE DISPLAYS WITH
LONG-RANGE SONAR SYSTEMS TO ENHANCE OPERATOR
DETECTION PERFORMANCE. (AUTHOR) (U)

UNCLASSIFIED

UDL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-728 249 6/11
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

DETERMINATION OF CHARACTERISTICS OF A SELF-
CONTAINED DIVING AND SWIMMING OUTFIT OF
FRENCH DESIGN. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 49 JIP BLOCKWICH, THOMAS H. I
MOLUMPY, J. G. ;
REPT. NO. NEOU-RN-5-49
PROJ: NS-106-U12

UNCLASSIFIED REPORT

DESCRIPTORS: (BREATHING APPARATUS,
PERFORMANCE (ENGINEERING)), (UNDERWATER
CLOTHING, DIVING), GAS CYLINDERS, VALVES,
BREATHING MASKS, RESPIRATION, TESTS, GAS FLOW,
FRANCE (U)
IDENTIFIERS: EVALUATION, DEMAND REGULATING VALVES,
BREATHING RESISTANCE (U)

THE OBJECT OF THE EXPERIMENT IS TO TEST AND
DETERMINE THE CHARACTERISTICS OF A SELF-CONTAINED
DIVING AND SWIMMING OUTFIT OF FRENCH DESIGN. THIS
OUTFIT CONSISTS OF AN AIR CYLINDER, A DEMAND
REGULATING VALVE, A MOUTHPIECE, TWO HOSES AND A FACE
MASK COVERING THE EYES AND NOSE. THERE IS NO
RECIRCULATING SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-726 451 5/9 15/7
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

REPORT OF DIVING TRAINING IN USS KITTIWAKE IN
THE BAY OF PANAMA DURING THE PERIOD 26 MAR TO
5 MAY 1949.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 49 4P MOLUMPHY, G. G. I
REPT. NO. NEDU-RN-9-49
PROJ: NS-186-042

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UNCLASSIFIED REPORT

DESCRIPTORS: (*DIVING, *NAVAL TRAINING), (*DEEP
SUBMERGENCE, DIVING), DECOMPRESSION, TABLES,
BREATHING APPARATUS, DECOMPRESSION SICKNESS,
PERFORMANCE (HUMAN), NAVAL PERSONNEL, LIQUID
LEVEL GAGES

IDENTIFIERS: DIVING EQUIPMENT

(U)

(U)

THE OBJECTIVES OF THE TRAINING WERE: TO TRAIN
ALL MEMBERS OF THE DIVING PARTY IN OPERATIONS AT
RELATIVELY DEEP DEPTHS; TO FURTHER EVALUATE SURFACE
DECOMPRESSION PROCEDURES; TO TEST MODIFIED DIVING
GEAR; TO PROVE NEWLY COMPUTED DECOMPRESSION TABLES AT
SEA; TO PROMOTE CONFIDENCE IN HELIUM OXYGEN EQUIPMENT
AND DIVING METHODS. (AUTHOR)

(U)

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-724 054 8-10 17/2
FLORIDA UNIV GAINESVILLE COMMUNICATION SCIENCES LAB

SCIENTIST-IN-THE-SEA, A SYMPOSIUM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 71 IUP HOLLIEN, HARRY; ROTHMAN,
HOWARD;
REPT. NO. CSL/ONK-32
CONTRACT: N00014-68-A-0173-0008

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON UNDERWATER SPEECH
COMMUNICATION.

DESCRIPTORS: (OCEANOLOGY, SYMPOSIA), (DIVING,
DEEP WATER), (UNDERWATER COMMUNICATION SYSTEMS,
DIVING), UNDERWATER CLOTHING, UNDERWATER
VEHICLES, TRAINING, BREATHING APPARATUS, AQUATIC
ANIMALS, SALVAGE, SPEECH, ANESTHESIA, NITROGEN,
HEARING, VISION, REPORTS (U)

THE SCIENTIST-IN-THE-SEA SYMPOSIUM WAS
CONDUCTED IN ORDER TO LEARN MORE ABOUT THE ROLE OF
THE SCIENTIFIC DIVING COMMUNITY IN THE EXPLORATION
AND UTILIZATION OF HYDROSPACE. THE FOCUS OF THE
SYMPOSIUM WAS ON THREE MAJOR AREAS: (1)
THE PROBLEMS ENCOUNTERED BY THE DIVING SCIENTIST
AND THE STATE OF TECHNOLOGY RELATIVE TO THOSE
PROBLEMS; (2) AN OVERVIEW OF HOW THE SCIENTIST
WORKS IN THE SEA; AND (3) DEVELOPMENT OF A
PROGRAM TO TRAIN SCIENTISTS TO WORK EFFECTIVELY IN
THE SEA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-729 657 6/17
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

THE DETERMINATION OF THE BASIC CONDITION OF
LIGHTNESS THAT CAN BE ATTAINED BY THE PRESENT
LIGHTWEIGHT DIVING OUTFIT AND THE UNDERWATER
SWIM SUIT AND THE EVALUATION OF THEIR
OPERATING CHARACTERISTICS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 50 14P BLOCKWICK, THOMAS N. ;
REPT. NO. NEDU-RK-2-50
PROJ: NS-186-052

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UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, WEIGHT),
EFFECTIVENESS, DIVING, BUOYANCY, PROTECTIVE
MASKS

(U)

THE RESEARCH WAS CONDUCTED TO DETERMINE THE BASIC
CONDITION OF LIGHTNESS THAT CAN BE ATTAINED BY THE
PRESENT LIGHTWEIGHT DIVING OUTFIT AND THE UNDERWATER
SWIM SUIT UNDER VARIOUS DRESS CONDITIONS AND TO
DETERMINE THE OPERATING CHARACTERISTICS OF THEM SO
THAT THESE RESULTS CAN BE USED AS A BASIS FOR FUTURE
IMPROVEMENTS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-730 036 13/2
NORTH AMERICAN ROCKWELL CORP SEAL BEACH CALIF SPACE
DIV

A METHOD FOR EVALUATION AND SELECTION OF
DEEP OCEAN LOAD HANDLING SYSTEMS. VOLUME
1.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 70-12 FEB 71,
MAY 71 SHIP KNIGHT, R. J. CURRY, J.
E. BULGING, V. L. MITCHELL, J. C. WELDON,
H. P. ;
REPT. NO. SD-71-293-1
CONTRACT: N62J49-70-C-0024
MONITOR: NCEL CR-71.009

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH SANTA
FE INTERNATIONAL, LOS ANGELES, CALIF. REVISION
OF REPORT DATED JAN 71. SEE ALSO VOLUME 2, AD-730
037.

DESCRIPTORS: (CONSTRUCTION MATERIALS, HANDLING),
(CONSTRUCTION, UNDERWATER), HOISTS,
UNDERWATER EQUIPMENT, MATHEMATICAL MODELS,
COMPUTER PROGRAMS, OPERATION, COSTS, VISIBILITY,
OCEAN BOTTOM TOPOGRAPHY, ICE, STORMS,
CLASSIFICATION, IDENTIFICATION, REVIEWS (U)
IDENTIFIERS: DEEP OCEAN LOAD HANDLING
SYSTEMS, EVALUATION (U)

THE STUDY FOR THE DEVELOPMENT OF A METHOD FOR
THE EVALUATION AND SELECTION OF DEEP OCEAN
LOAD HANDLING SYSTEMS WAS CONDUCTED TO ASSIST
THE U.S. NAVY IN PERFORMING SEAFLOOR
CONSTRUCTION PROJECTS THROUGH CONSIDERATION OF
OPERATIONS INVOLVING EQUIPMENT AND TRANSPORT OF
MATERIALS FOR LOAD IMPLANTMENT. THE STUDY HAS
ACCOMPLISHED FOUR PRIMARY TASKS: (1) THE
ASSEMBLAGE AND ORGANIZATION OF DATA; (2) THE
DEVELOPMENT OF A MATHEMATICAL MODEL WHICH IS
DESCRIPTIVE OF A GENERALIZED TOTAL DEEP OCEAN
IMPLANTMENT MISSION; (3) TRANSLATION OF THE
DATA AND MODEL INTO A COMPUTERIZED METHOD TO ENHANCE
UTILIZATION; AND (4) VALIDATION OF THE METHOD
THROUGH APPLICATION OF SELECTED CASE EXAMPLES. THE
METHOD PROVIDES THE CAPABILITY TO EVALUATE ANY
SELECTED DEEP OCEAN LOAD HANDLING SYSTEM ON THE BASIS
OF CRITICAL MISSION PARAMETERS. THIS VOLUME
CONTAINS A SYNOPSIS OF THE STUDY SCOPE OF THE DEEP
OCEAN LOAD HANDLING MISSION.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-730 711 6/7 13/10-1 6/17 5/5
NAVAL SUBMARINE MEDICAL RESEARCH LAB GROTON CONN

HUMAN FACTORS EVALUATION OF SUBMARINE
ESCAPE: 11-A. TOP EGRESS WITH THE
BRITISH SUBMARINE ESCAPE IMMERSION SUIT AND
THE STEINKE HOOD. (U)

DESCRIPTIVE NOTE: INTERIM REPT.:
OCT 70 29P HYACK, BERNARD L. WALTERS,
GARY B. I
REPT. NO. SMRL-644
PROJ: MF12.524.006
MONITOR: NAVMED MF12.524.006-40258-38

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE: SEE ALSO AD-718 455.

DESCRIPTORS: (*SUBMARINE ESCAPE, HUMAN
ENGINEERING), (*UNDERWATER CLOTHING, SUBMARINE
ESCAPE), DECOMPRESSION SICKNESS, TIME, MATCHES,
SUBMARINE PERSONNEL, CORRELATION TECHNIQUES, SEA
RESCUE EQUIPMENT, TESTS (U)

IDENTIFIERS: MARK 7 SUBMARINE ESCAPE SUITS,
*STEINKE HOODS, *SUBMARINE ESCAPE SUITS,
*SUBMARINE ESCAPE APPLIANCES, SIDE EGRESS ESCAPE
TRUNKS, TUBE EGRESS ESCAPE TRUNKS, TOP EGRESS
ESCAPE TRUNKS (U)

THE BRITISH MARK VII SUBMARINE ESCAPE
IMMERSION SUIT (SEIS) WHICH PROVIDES THERMAL
PROTECTION, AND THE STEINKE HOOD WHICH DOES NOT,
WERE EVALUATED FOR SINGLE-MAN AND GROUP ESCAPE (2-
AND 3-MAN TEAMS) FROM A SIMULATED TOP EGRESS
UNITED STATES NAVY ESCAPE TRUNK. FOR BOTH
ESCAPE APPLIANCES, EGRESS TIME INCREASED LINEARLY AS
A FUNCTION OF TEAM SIZE. THREE-MAN TEAMS AND TWO-
MAN TEAMS ESCAPED FASTER WITH THE SEIS THAN WITH
THE STEINKE HOOD; THERE WAS NO DIFFERENCE FOR
ONE-MAN ESCAPES. SINGLE-MAN ESCAPE TIMES WITH THE
SEIS WERE COMPARABLE TO THOSE OBTAINED BY THE
BRITISH. WHEN COMPARED WITH SIDE AND TUBE
EGRESS, TOP EGRESS OFFERS A SUBSTANTIAL REDUCTION IN
ESCAPE TIME AND THEREFORE IN TOTAL BOTTOM TIME.
SAFE ESCAPES FROM DEPTHS IN ACCESS OF 450 FEET BY
TEAMS OF MORE THAN TWO MEN ARE FEASIBLE FROM A TOP
MATCH CONFIGURATION BUT ARE NOT POSSIBLE FROM A SIDE
OR TUBE EGRESS CONFIGURATION. A SUBMARINE ESCAPE
SYSTEM EMPLOYING TOP EGRESS AND THE EXPOSURE
PROTECTION OF THE SEIS IS RECOMMENDED.
(AUTHOR) (U)

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/ZHK23

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-731 012 6/17
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

EVALUATION OF THE NEW TYPE DESCO
LIGHTWEIGHT DIVING SUIT UP TO A DEPTH OF 99
FEET UNDER CONDITIONS OF MODERATE WORK. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 51 OP BLOCKWICK, THOMAS N. I
REPT. NO. NELU-RN-1-51
PROJ: NS-186-201

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, EFFICIENCY),
EXERCISE, DIVING, DESIGN, FEASIBILITY STUDIES (U)
IDENTIFIERS: DIVING SUITS (U)

THE OBJECT OF THIS EXPERIMENT IS TO EVALUATE THE
DESCO LIGHT WEIGHT DIVING SUIT UP TO A DEPTH OF 99
FEET UNDER CONDITIONS OF MODERATE WORK. (U)
(AUTHOR)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AUG 73, 013 6/17
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

TEST OF ELECTRICALLY HEATED CLOTHING.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 51 ZUP BLOCKWICK, THOMAS N. I
REPT. NO. NEDU-KK-3-51
PROJ: NS-146-012

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, HEATING
ELEMENTS), DIVING, WATER, TEMPERATURE,
EFFICIENCY

IDENTIFIERS: BOOTS, GLOVES

(U)

(U)

THE OBJECT OF THIS EXPERIMENT IS TO EVALUATE A SET
OF ELECTRICALLY HEATED BOOTS AND GLOVES FOR
UNDERWATER SWIMMERS UNDER CONDITIONS OF VARIOUS WATER
TEMPERATURES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-731 614 6/17
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C

EVALUATION OF THE BRITISH VARBELL SELF
CONTAINED SWIMMING SUIT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAN 51 IIP WAITE, CHARLES L. ;
REPT. NO. NEU-RR-4-51
PROJ: NS-164-012

UNCLASSIFIED REPORT

DESCRIPTORS: (UNDERWATER CLOTHING, EFFICIENCY),
DIVING, BREATHING APPARATUS, FEASIBILITY STUDIES,
DESIGN

(U)

IDENTIFIERS: *DIVING SUITS

(U)

THE OBJECT OF THIS EXPERIMENT IS TO TEST THE
BRITISH 'VARBELL' SHALLOW WATER SWIMMING UNIT AT
20, 30 AND 40 FEET UNDER MODERATE WORKING CONDITIONS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-731 358 13/7 13/10
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF

SUBMERSIBLE DIVER TOOL POWER SOURCES:
ELECTRO-HYDRAULIC AND CRYOGENIC
PNEUMATIC.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE JUL 70-JUN 71,
AUG 71 41P BLACK, S. A. I
REPT. NO. NCEL-TN-1174
PROJ: YF38-535.003.01.002

UNCLASSIFIED REPORT

DESCRIPTORS: (•SMALL TOOLS, •POWER SUPPLIES),
(•DIVING, SMALL TOOLS), (•CONSTRUCTION,
UNDERWATER), POWER EQUIPMENT, HYDRAULIC SYSTEMS,
PNEUMATIC DEVICES, CRYOGENICS, SALVAGE, TEST
METHODS, DESIGN, PERFORMANCE (ENGINEERING),
MARINE ENGINEERING

(U)

IDENTIFIERS: •ELECTROHYDRAULIC EQUIPMENT,
•CRYOGENIC PNEUMATIC EQUIPMENT, EVALUATION

(U)

TWO SELF-CONTAINED AND COMPLETELY SUBMERSIBLE POWER
SUPPLIES FOR POWERING DIVER OPERATED HAND HELD TOOLS
ARE DISCUSSED; ONE POWER SUPPLY OPERATES PNEUMATIC
TOOLS WHILE THE OTHER OPERATES CLOSED CYCLE OIL
HYDRAULIC TOOLS. OPERATIONAL EVALUATIONS WERE
PERFORMED WITH NAVY QUALIFIED DIVERS USING HAND
HELD TOOLS POWERED BY THE MODULES TO FIND WHETHER
BOTH CONCEPTS WERE EFFECTIVE AS SUBMERSIBLE POWER
SOURCES. REFINEMENTS NECESSARY ARE DELINEATED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AU-733 443 5/9 5/10
TEXAS UNIV AUSTIN SOCIAL PSYCHOLOGY LAB

DIAGNOSIS AND PREDICTION: A STUDY OF
DAILY BEHAVIOR PATTERNS IN TEKITE 2. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 71 49P BAKEMAN, ROGER; HELMREICH,
ROBERT;
REPT. NO. TR-17
CONTRACT: N00014-67-A-0126-0001
PROJ: NM-171-004

UNCLASSIFIED REPORT

DESCRIPTORS: (PROFESSIONAL PERSONNEL, BEHAVIOR),
(OCEAN BOTTOM, PROFESSIONAL PERSONNEL),
SCIENTIFIC RESEARCH, UNDERWATER VEHICLES,
LABORATORIES, UNDERWATER EQUIPMENT, DECOMPRESSION,
CLOSED ECOLOGICAL SYSTEMS, DATA PROCESSING SYSTEMS,
LABOR, ATTITUDES (U)
IDENTIFIERS: AQUANAUTS, TEKITE 2 PROJECT,
(U)
UNDERWATER HABITATS, MOODS

SYSTEMATIC OBSERVATIONS OF DAILY BEHAVIOR OF 10
TEAMS OF AQUANAUTS LIVING FOR A TOTAL OF SEVEN
MONTHS IN AN UNDERWATER HABITAT ARE REPORTED.
BEHAVIOR WAS CODED INTO OBJECTIVE CATEGORIES BY
TEAMS OF OBSERVERS MONITORING ACTIVITY 24 HOURS A
DAY. CORRELATIONS BETWEEN THESE CATEGORIES FOR
INDIVIDUAL SUMMARY DATA ARE CONTRASTED WITH THE
CORRESPONDING POOLED WITHIN-CLASS CORRELATIONS.
THE LATTER ARE USED HERE AS A STATISTIC MEASURING
ASSOCIATIVE STRENGTH BETWEEN TIME SERIES VARIABLES
BOTH WITHIN AND ACROSS INDIVIDUALS. THE USE OF
BOTH PEARSON AND POOLED CORRELATIONS PROVIDES A
MORE COMPLETE PICTURE OF DAILY BEHAVIORAL PATTERNS.
POOLING CORRELATIONS OF LAGGED VARIABLES THEN
ALLOWS EXPLORATION OF CAUSAL LINKAGES. SYSTEMATIC
OBSERVATIONS AND SELF-REPORT MEASURES ARE CONTRASTED
IN THEIR ABILITY TO ACCOUNT FOR VARIANCE IN BEHAVIOR.
THE POTENTIAL APPLICATION OF THIS METHODOLOGY TO A
VARIETY OF SOCIAL PSYCHOLOGICAL INVESTIGATIONS IS
DISCUSSED. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-733 444 5/10 6/19
TEXAS UNIV AUSTIN SOCIAL PSYCHOLOGY LAB

THE LIFE HISTORY QUESTIONNAIRE:
PREDICTION OF PERFORMANCE IN NAVY DIVER
TRAINING.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 71 23P HELMREICH, ROBERT ; BAKEMAN,
RUGER ; NAULOFF, ROLAND ;
REPT. NO. TR-18
CONTRACT: N00014-67-A-0126-DUD1
PROJ: NR-171-804

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPONSORED IN PART BY NATIONAL
SCIENCE FOUNDATION, WASHINGTON, D. C.

DESCRIPTORS: (-NAVAL PERSONNEL, BEHAVIOR),
(-DIVING, NAVAL TRAINING), OCEAN BOTTOM,
QUESTIONNAIRES, STATISTICAL ANALYSIS, CONFINED
ENVIRONMENTS, STRESS(PSYCHOLOGY),
STRESS(PHYSIOLOGY)

(U)

IDENTIFIERS: TEKITE 2 PROJECT

(U)

THE IMPETUS FOR THE DEVELOPMENT OF THE LIFE
HISTORY QUESTIONNAIRE WAS A LARGE-SCALE FIELD
INVESTIGATION OF THE BEHAVIOR OF AQUANAUTS DURING
PROJECT TEKITE 2 (HELMREICH, 1971). THE
GOAL WAS TO UNDERSTAND AND EXPLAIN DIFFERENCES AMONG
TEKITE AQUANAUTS IN THEIR ABILITY TO WORK
EFFECTIVELY UNDERWATER, TO GET ALONG WITH FELLOW
TEAMMATES, AND TO ADJUST GENERALLY TO A STRESSFUL,
ISOLATED AND CONFINING ENVIRONMENT.
(AUTHOR)

(U)

UNCLASSIFIED

UCL REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-734 014 5/10
CALIFORNIA UNIV LOS ANGELES SCHOOL OF ENGINEERING AND
APPLIED SCIENCE

UNDERWATER WORK MEASUREMENT
TECHNIQUES:

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 71 61P WELTMAN, GERSHON IEGSTROM,
GLEN H. WILLIS, MICHAEL A. CUCCARO, WILLIAM I
REPT. NO. UCLA-ENG-7140
CONTRACT: N00014-67-A-0111-0007
PROJ: NR-196-069

UNCLASSIFIED REPORT

DESCRIPTORS: (•PERFORMANCE(HUMAN), DIVING),
MEASUREMENT, TEST EQUIPMENT, TEST FACILITIES,
HUMAN ENGINEERING, PHYSIOLOGY, DATA PROCESSING
SYSTEMS, PROGRAMMING(COMPUTERS)

(U)

IDENTIFIERS: TASK PERFORMANCE, UNDERWATER
TASKS

(U)

THE FOURTH AND CONCLUDING REPORT IS GIVEN IN A
SERIES DESCRIBING YEARLY PROGRESS OF THE UCLA
RESEARCH PROJECT ON OPTIMUM UNDERWATER WORK
MEASUREMENT TECHNIQUES. THE PREVIOUS REPORTS HAVE
COVERED STUDIES CONDUCTED IN 1967, 1968 AND 1969.
THIS REPORT, IN ADDITION TO PRESENTING THE TWO
MAJOR STUDIES CARRIED OUT IN 1970, ALSO PROVIDES A
SUMMARY OF WORK OVER THE FOUR YEAR PERIOD. THE
CUMULATIVE LIST OF PROJECT PUBLICATIONS ALLOWS THE
READER TO IDENTIFY A TOPIC OF CONCERN, DETERMINE
PRIMARY FINDINGS, AND EXPLORE THE TOPIC FURTHER IN
THE LITERATURE OR BY REPRINT REQUEST.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD735 045 5/5 13/10.1
BUREAU OF NAVAL WEAPONS WASHINGTON D C

HUMAN FACTORS DESIGN STANDARDS FOR THE
FLEET BALLISTIC MISSILE WEAPONS SYSTEM.
VOLUME 2. DESIGN OF EQUIPMENT.

(U)

AUG 62 332P
REPT. NO. NAVWEPS-00-18413A-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-735 044.

DESCRIPTORS: (HUMAN ENGINEERING, BALLISTIC MISSILE
SUBMARINES), (BALLISTIC MISSILE SUBMARINES,
WEAPON SYSTEMS), MAN-MACHINE SYSTEMS, ELECTRONIC
EQUIPMENT, CONTROL PANELS, DISPLAY SYSTEMS,
COMMUNICATION EQUIPMENT, MAINTENANCE EQUIPMENT,
SYSTEMS ENGINEERING, DESIGN
IDENTIFIERS: DESIGN STANDARDS

(U)

(U)

THE BASIC OBJECTIVE OF THIS HANDBOOK IS TO PROVIDE
SPECIAL ASSISTANCE TO SYSTEM AND COMPONENT ENGINEERS
AND HUMAN FACTORS SPECIALISTS IN PERFORMING THOSE
PORTIONS OF THEIR ENGINEERING ACTIVITIES WHICH MAY
RESULT IN THE SPECIFICATION OR DESIGN OF HARDWARE TO
BE OPERATED AND/OR MAINTAINED ABOARD FBH
SUBMARINES. VOLUME 2, 'DESIGN OF EQUIPMENT,'
CONTAINS SECTIONS 3 AND 4 OF THE HANDBOOK AND
PRESENTS INFORMATION ON WHICH TO BASE THE SELECTION,
UTILIZATION, AND DESIGN OF EQUIPMENT TO ENHANCE HUMAN
OPERATION AND MAINTENANCE ACTIVITIES AND THUS ACHIEVE
IMPROVED SYSTEM PERFORMANCE AND AVAILABILITY.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-803 277 17/1 9/2
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

ANALYTICAL INVESTIGATIONS OF DIGITAL INFORMATION
PROCESSING SYSTEMS. VOLUME 1. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 1, AUG 65-APR 66,
AUG 66 185P BOOTH, TAYLOR L. ; GLORIOSO,
ROBERT M. ; KAUFMAN, HERBERT M. ; LEVY, ROBERT
M. ; WALTER, JAMES K. ;
REPT. NO. U417-66-U24-VOL-1
CONTRACT: NONR-2512(UO)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
CONNECTICUT UNIV., STORRS.

DESCRIPTORS: (•DATA PROCESSING SYSTEMS, •SONAR
RECEIVERS), (•DIGITAL COMPUTERS, UNDERWATER OBJECT
LOCATORS), SONAR TARGETS, DETECTION, PASSIVE,
CONTROL SYSTEMS, EXPERIMENTAL DATA, UNDERWATER
SOUND SIGNALS, SEQUENCES, SAMPLING, DISPLAY
SYSTEMS, STATISTICAL ANALYSIS, PROBABILITY, COMBAT
INFORMATION CENTERS, COMMAND • CONTROL SYSTEMS,
SUBMARINES (U)
IDENTIFIERS: •MAN-MACHINE SYSTEMS, •SONAR
PERSONNEL, PERFORMANCE(HUMAN) (M)

THE AIM OF THIS PROJECT IS TO PROVIDE BASIC
KNOWLEDGE CONCERNING THE METHODS WHICH MAY BE USED BY
A MAN-COMPUTER SYSTEM TO DETECT THE PRESENCE OF A
TARGET USING DATA FROM A PASSIVE SONAR RECEIVER.
THIS RESEARCH CONSISTS OF ANALYTICAL STUDIES TO
EVALUATE IMPORTANT SYSTEM PARAMETERS AND EXPERIMENTAL
INVESTIGATIONS TO MEASURE OPERATOR PERFORMANCE UNDER
VARIOUS OPERATING CONDITIONS. THE FIRST TWO
REPORTS EVALUATE THE LOSS IN DETECTION CAPABILITY IF
CLIPPED DATA RATHER THAN CONTINUOUS DATA IS USED FOR
DETECTION. UNDER THE ALERTED OPERATOR ASSUMPTION
IT IS SHOWN THAT, ON THE AVERAGE, FEWER SIGNAL
SAMPLES ARE REQUIRED TO ACHIEVE A GIVEN DETECTION
CAPABILITY USING SEQUENTIAL DETECTION TECHNIQUES
INSTEAD OF FIXED SAMPLE SIZE DETECTION TECHNIQUES.
THE NEXT TWO REPORTS DESCRIBE METHODS OF IMPROVING
DETECTION PROBABILITY THROUGH PRE-PROCESSING OF THE
CLIPPED SIGNAL BEFORE IT IS PRESENTED TO THE OPERATOR
IN THE FORM OF A BINARY BEARING-TIME DISPLAY. THE
LAST TWO REPORTS INVESTIGATE METHODS TO ANALYZE THE
STATISTICAL PROPERTIES OF CORRELATED RANDOM DIGITAL
SEQUENCES.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-815 467 5/10 15/1
HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

HUMAN FACTOR PROBLEMS IN ANTI-SUBMARINE WARFARE. (U)

DESCRIPTIVE NOTE: FINAL LETTER REPT.,
MAY 67 11P MACKIE, ROBERT R. ;
CONTRACT: NONR-2649(UO)
PROJ: NR-153-199, HFR-206

UNCLASSIFIED REPORT

DESCRIPTORS: (•ANTISUBMARINE WARFARE,
PERFORMANCE(HUMAN)), (•SONAR PERSONNEL,
PERFORMANCE(HUMAN)), HUMAN ENGINEERING,
ATTENTION, TARGET RECOGNITION, TARGET DESIGNATORS,
RESPONSE, EFFECTIVENESS, SCANNING SONAR,
MAINTENANCE PERSONNEL, DISPLAY SYSTEMS,
REACTION(PSYCHOLOGY), MAINTENANCE, TRAINING,
DESIGN, PERFORMANCE TESTS, TEST
CONSTRUCTION(PSYCHOLOGY), SONAR TARGETS,
CLASSIFICATION (U)

IDENTIFIERS: INDIVIDUAL DIFFERENCES (U)

CONTENTS: HUMAN VIGILANCE AND TARGET
DETECTION; TARGET DETECTION AND OPERATING
TECHNIQUE; TARGET CLASSIFICATION TECHNIQUE;
SONAR MAINTENANCE AND TRAINING; SONAR
DISPLAYS AND SYSTEMS DESIGN; DEVELOPMENT OF
TRAINING MATERIALS AND OPERATOR PERFORMANCE
TESTS; AND PRESENTATIONS AND INFORMATION
EXCHANGE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AU-833 124 6/19
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

DIVING RESEARCH IN SWITZERLAND;

(U)

MAY 68 14P LIBBER, LEONARD M. ;
REPT. NO. UNKL-32-68

UNCLASSIFIED REPORT

DESCRIPTORS: (•DIVING, STRESS(PHYSIOLOGY)),
SCIENTIFIC PERSONNEL, DECOMPRESSION, DECOMPRESSION
SICKNESS, UNDERWATER EQUIPMENT, PHYSIOLOGY, HIGH-
PRESSURE RESEARCH, OXYGEN, SAFETY, HAZARDS,
UNDERWATER VEHICLES, SWITZERLAND
IDENTIFIERS: SATURATION DIVING

(U)
(U)

THIS REPORT DESCRIBES THE CURRENT INTERESTS OF TWO
PEOPLE WHO HAVE BEEN VERY PROMINENT IN ADVANCING
MAN'S DEEP DIVING CAPABILITIES: MR. HANNES
KELLER AND PROF. A. A. BUHLMANN.
ALTHOUGH KELLER IS NOW DEVOTING HIS EFFORTS TO
THE DESIGN, DEVELOPMENT, AND MANUFACTURE OF IMPROVED
DIVING EQUIPMENT, BUHLMANN CONTINUES TO WORK ON
PHYSIOLOGICAL PROBLEMS RELATED TO DEEP DIVING AND
SATURATION DIVING. THESE EFFORTS ARE REVIEWED.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-853 517 6/16 5/10
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

A FOLLOW-UP VISIT TO THE ROYAL NETHERLANDS
NAVY DIVING MEDICAL CENTER, DEN
HELDER.

(U)

DESCRIPTIVE NOTE: MEMORANDUM REPT.,
MAY 69 BP BERRY, NEWELL H. ; LIBBER,
LEONARD M. ;
REPT. NO. UNHL-M-14-69

UNCLASSIFIED REPORT

DESCRIPTORS: (DIVING, STRESS(PHYSIOLOGY)),
OXYGEN, TOXICITY, ELECTROENCEPHALOGRAPHY,
TRAINING, PERFORMANCE(HUMAN), PERFORMANCE
TESTS, STATISTICAL DATA, NETHERLANDS

(U)

A DISCUSSION OF THE RESEARCH OBJECTIVES AND
TECHNIQUES OF THE MEDICAL AND PSYCHOLOGICAL STAFF
MEMBERS OF THE DIVING MEDICAL CENTRE, DEN
HELDER, IS PRESENTED. MOST OF THE CURRENT DATA
COLLECTION IS INVOLVED IN ESTABLISHING BASE LINE
VALUES ON CANDIDATES ENTERING THE DIVER TRAINING
PROGRAM. SOME ADDITIONAL DATA ON PHYSIOLOGICAL
PERFORMANCE ARE COLLECTED ANNUALLY FROM EXPERIENCED
DIVERS AND UNDERWATER SWIMMERS. THE MOST UNUSUAL
FINDING IS THE APPEARANCE OF SLIGHT IRREGULARITIES IN
THE EEG'S OF FRUGMEN USING HIGH PRESSURE OXYGEN
SEVERAL TIMES PER WEEK FOR SEVERAL YEARS. THESE
DATA MUST BE CAREFULLY ANALYZED BEFORE A CONCLUSION
CAN BE DRAWN. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZMK23

AD4870 L34 6/11 15/7
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
NU

DIVING EQUIPMENT, SCUBA.

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

MAR 70 3UP

REPT. NO. MTP-10-3-213

PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (SCUBA DIVERS, BREATHING APPARATUS),
(BREATHING APPARATUS, TEST METHODS), HUMAN
ENGINEERING, SAFETY, MAINTENANCE,
PERFORMANCE(ENGINEERING), OPERATION, ARMED
FORCES SUPPLIES

(U)

IDENTIFIERS: SCUBA(SELF CONTAINED UNDERWATER
BREATHING APPARATUS), SELF CONTAINED
UNDERWATER BREATHING APPARATUS, COMMODITY SERVICE
TEST PROCEDURE

(U)

THE ARMY SERVICE TEST PROCEDURE DESCRIBES TEST
METHODS AND TECHNIQUES NECESSARY TO DETERMINE THE
DEGREE TO WHICH SELF-CONTAINED UNDERWATER BREATHING
APPARATUS (SCUBA) DIVING EQUIPMENT, AND ASSOCIATED
TOOLS AND EQUIPMENT, PERFORM THEIR FUNCTIONS AS
DESCRIBED IN QUALITATIVE MATERIEL REQUIREMENTS,
SMALL DEVELOPMENT REQUIREMENTS, MILITARY
CHARACTERISTICS OR OTHER DEVELOPMENTAL CRITERIA,
AND TO ASCERTAIN THE SUITABILITY OF THESE ITEMS AND
THEIR MAINTENANCE PACKAGES FOR SERVICE USE BY THE
ARMY. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK23

AD-871 349 6/11

ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

DIVING EQUIPMENT (HELMETS, BELTS, DIVERS
DRESS, ETC).

(U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.

NAF 70 31P

REPT. NO. MTP-10-2-192

PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (ARMY OPERATIONS, MARINE SAFETY
EQUIPMENT), (MARINE SAFETY EQUIPMENT,
UNDERWATER), (UNDERWATER EQUIPMENT,
ACCEPTABILITY), UNDERWATER CLOTHING, HELMETS,
DIVING, SCUBA DIVERS, BREATHING APPARATUS, TEST
METHODS, HYDROSTATIC TESTS, HUMAN ENGINEERING,
PERFORMANCE(ENGINEERING), QUALITY CONTROL

(U)

THIS ENGINEERING TEST PROCEDURE DESCRIBES
TEST METHODS AND TECHNIQUES NECESSARY TO DETERMINE
THE TECHNICAL PERFORMANCE AND SAFETY CHARACTERISTICS
OF DIVING EQUIPMENT, AS DESCRIBED IN QUALITATIVE
MATERIEL REQUIREMENTS (QMR), SMALL
DEVELOPMENT REQUIREMENTS (SDR), TECHNICAL
CHARACTERISTICS (TC), AND THEIR SUITABILITY FOR
SERVICE TESTS. THE DIVING EQUIPMENT IS CATEGORIZED
AS: SURFACE-SUPPLIED DIVING EQUIPMENT; SELF-
CONTAINED DIVING EQUIPMENT, INCLUDING SELF-CONTAINED
UNDERWATER BREATHING APPARATUS (SCUBA); AND DIVING
ACCESSORIES. (AUTHOR)

(U)

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CORPORATE AUTHOR - MONITORING AGENCY

*APPLIED PSYCHOLOGICAL SERVICES INC
WAYNE PA SCIENCE CENTER

DIGITAL SIMULATION OF THE
PERFORMANCE OF INTERMEDIATE SIZE
CREWS. I. LOGIC OF A MODEL FOR
SIMULATING CREW PSYCHOSOCIAL AND
PERFORMANCE VARIABLES.
AD-695 839

7172-1
SUMMARY OF HUMAN FACTORS IN
SUPPORT OF SONAR SYSTEM
DEVELOPMENT.
AD-726 711

*ARCTIC INST OF NORTH AMERICA
WASHINGTON D C

A SMALL RESEARCH SUBMARINE IN
THE ARCTIC.
AD-690 428

*ARIZONA STATE UNIV TEMPE

0201071
SYSTEMS ANALYSIS AND MODELING
OF SMALL GROUPS: ISOLATION AND
SEALAB.
AD-718 413

*ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND MD

MTP-6-2-502
HUMAN FACTORS ENGINEERING.
AD-720 776

MTP-10-2-192
DIVING EQUIPMENT (HELMETS,
BELTS, DIVERS DRESS, ETC).
AD-871 349

MTP-10-3-213
DIVING EQUIPMENT, SCUBA.
AD-870 034

*ASSOCIATION OF SENIOR ENGINEERS
(NAVSHIPS) WASHINGTON D C

1970 ANNUAL TECHNICAL SYMPOSIUM

(7TH). MECHANICAL SYSTEMS FOR
OCEAN ENGINEERING.
AD-709 393

*ASTRO NAUTICAL RESEARCH INC CAMBRIDGE
MASS

SATURATION DIVES, WITH
EXCURSIONS, FOR THE DEVELOPMENT OF
A DECOMPRESSION SCHEDULE FOR USE
DURING SEALAB III.
(NEDU-RR-9-70)
AD-723 174

*BATTELLE MEMORIAL INST COLUMBUS OHIO
COLUMBUS LABS

LOW-PRESSURE COMPRESSED AIR
BREATHING SYSTEMS STUDY. II. MARK
V HELMET VENTILATION STUDIES.
AD-713 395

*BIOMARINE INDUSTRIES INC DEVON PA

UNCP-70-3
A STUDY OF DIVER PERFORMANCE
WITH COMMUNICATION AIDS.
AD-715 671

UNCP-70-15
A STUDY OF DIVER PERFORMANCE
WITH COMMUNICATION AIDS.
AD-726 225

*BIOTECHNOLOGY INC ARLINGTON VA

AN INTEGRATED MEASUREMENT
SYSTEM FOR THE STUDY OF HUMAN
PERFORMANCE IN THE UNDERWATER
ENVIRONMENT.
AD-680 028

*BIOTECHNOLOGY INC FALLS CHURCH VA

HUMAN PERFORMANCE IN THE
UNDERSEA ENVIRONMENT: AN ANNOTATED
BIBLIOGRAPHY.
AD-702 781

*BUREAU OF MEDICINE AND SURGERY
WASHINGTON D C

UNCLASSIFIED

BUR-DEE

 NAVMED-MF011.99-9002-4
 VISION UNDERWATER.
 AD-660 271

 NAVMED-MF011.99-9003.05
 SEALAB I: A PERSONAL
 DOCUMENTARY ACCOUNT.
 AD-635 656

 NAVMED-MR004-14-1200-05
 AUDITORY FATIGUE UNDERWATER AT
 1900 CYCLES PER SECOND.
 AD-624 753

 NAVMED-MR005.04-0063-2
 SATURATION-EXCURSION DIVING:
 BIOCHEMICAL CYCLE FUNCTIONS IN
 LACTIC DEHYDROGENASE, LACTATE, AND
 PYRUVATE RESPONSES.
 AD-678 846

 NAVMED-MR005.14-1100.06
 MINIMAL RED LIGHT LEVELS ON
 BOARD SUBMARINES.
 AD-639 176

*BUREAU OF NAVAL WEAPONS WASHINGTON D C

 NAVWEPS-00-18413A-VOL-2
 HUMAN FACTORS DESIGN STANDARDS
 FOR THE FLEET BALLISTIC MISSILE
 WEAPONS SYSTEM. VOLUME 2. DESIGN
 OF EQUIPMENT.
 AD-735 045

*BUREAU OF SHIPS WASHINGTON D C

 NAVSHIPS-250-880
 DIVING MANUAL.
 AD-653 694

*CALIFORNIA UNIV LOS ANGELES DEPT OF
 ENGINEERING

 68-61
 ADAPTATION OF DIVERS TO
 DISTORTION OF SIZE AND DISTANCE
 UNDERWATER.
 AD-684 871

 TR-45
 ADAPTATION OF DIVERS TO
 DISTORTION OF SIZE AND DISTANCE
 UNDERWATER.
 AD-684 871

*CALIFORNIA UNIV LOS ANGELES SCHOOL
 OF ENGINEERING AND APPLIED SCIENCE

 UCLA-ENG-7052
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES 1969 STUDIES.
 AD-710 348

 UCLA-ENG-7140
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES:
 AD-734 014

*CALIFORNIA UNIV LOS ANGELES
 BIOTECHNOLOGY LAB

 68-11
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES: INITIAL STUDIES.
 AD-668 180

 69-19
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES: 1968 STUDIES.
 AD-688 198

 TR-44
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES: INITIAL STUDIES.
 AD-668 180

 TR-46
 UNDERWATER WORK MEASUREMENT
 TECHNIQUES: 1968 STUDIES.
 AD-688 198

*DEEP SUBMERGENCE SYSTEMS PROJECT
 TECHNICAL OFFICE SAN DIEGO CALIF

 DSSP-TO-RR-1-68
 RESULTS OF PHYSIOLOGIC STUDIES
 CONDUCTED DURING CHAMBER SATURATION
 DIVES FROM 200 FEET TO 825 FEET. A
 PRELIMINARY REPORT.

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DUN-DUN

AD-673 532

*DUNLAP AND ASSOCIATES INC DARIEN
CONN

STUDY, FEASIBILITY OF UNDERSEA
SALVAGE SIMULATION.
(NAVTRADEVEN-69-C-0116-1)

AD-726 427

BS067-441
DIVER PERFORMANCE AND THE
EFFECTS OF COLD.
AD-670 021

SSD-66-296(571)
STUDIES OF DIVERS' PERFORMANCE
DURING THE SEALAB II PROJECT.
AD-630 518

SSD67-399
STUDIES OF THE PERFORMANCE
CAPABILITIES OF DIVERS: THE EFFECTS
OF COLD.
AD-653 755

*DUNLAP AND ASSOCIATES INC DARIEN
CONN

A PREDICTOR INSTRUMENT FOR
MANUAL CONTROL.
AD-288 962

*DUNLAP AND ASSOCIATES INC STAMFORD
CONN

HUMAN FACTORS IN THE DESIGN OF
THE SUBMARINE DIVING CONTROL
STATION.
(SPECDEVEN-641-1-1)
AD-642 738

PERFORMANCE OF CONTROLLERMAN IN
THE PROPULSION CUBICLE OF GUPPY
SUBMARINES.
(SPECDEVEN-641-2-1)
AD-642 739

HUMAN FACTORS IN THE DESIGN OF
THE SUBMARINE CONTROL ROOM.
(SPECDEVEN-641-2-4)

AD-642 799

MODIFICATION OF THE DESIGN OF
VISUAL DISPLAYS IN THE MANEUVERING
ROOM OF GUPPY SUBMARINES.
(SPECDEVEN-641-2-3)
AD-642 800

A HUMAN ENGINEERING STUDY OF
THE FORWARD TORPEDO ROOM IN THE
563/564 CLASS SUBMARINES.
(SPECDEVEN-641-2-11)
AD-643 115

HUMAN ENGINEERING STUDY OF THE
A85569 CONTROL ROOM.
(SPECDEVEN-641-2-15)
AD-643 116

LAYOUT, COMMUNICATION AND
SEATING IN THE AIR CONTROL CENTER
OF THE MIGRAINE III TYPE SUBMARINE.
(SPECDEVEN-641-2-14)
AD-643 117

ARRANGEMENT OF EQUIPMENT ON THE
SSK CONVERSION.
(SPECDEVEN-641-2-5)
AD-643 153

HUMAN FACTORS IN THE DESIGN OF
SUBMARINE COMMUNICATION SYSTEMS.
(SPECDEVEN-641-2-8)
AD-643 154

HUMAN ENGINEERING APPRAISAL OF
THE AIR CONTROL CENTER OF PICKET
SUBMARINES.
(SPECDEVEN-641-2-10)
AD-643 155

SUBMARINE CONTROL BY A SINGLE
OPERATOR.
(SPECDEVEN-954-00-18)
AD-643 655

ILLUMINATION IN THE ATTACK
CENTER AND PERISCOPE AREA OF THE SS
563/564.
(SPECDEVEN-641-2-2)
AD-643 828

0-3

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FLO-HUM

UNCLASSIFIED

TRAINING AND SUPERVISION OF
CONTROLLERMEN.
(SPECDEVEN-641-2-7)
AD-656 632

*FLORIDA UNIV GAINESVILLE
COMMUNICATION SCIENCES LAB

UNDERWATER SPEECH
COMMUNICATION.
AD-648 933

SPEECH INTELLIGIBILITY OF THE
BENDIX WATERCOM SYSTEM.
AD-648 934

A DIVER COMMUNICATION RESEARCH
SYSTEM (DICORS).
AD-648 935

CSL/ONR-32
SCIENTIST-IN-THE-SEA, A
SYMPOSIUM.
AD-729 054

*GENERAL DYNAMICS CORP GROTON CONN
ELECTRIC BOAT DIV

P60-014
MULTIPLE DISPLAY MONITORING.
III. TRACKING WHILE MONITORING.
AD-726 146

SPD60-049
MULTIPLE DISPLAY MONITORING.
III. TRACKING WHILE MONITORING.
AD-726 146

SPD 60 131
PROJECT SUBIC. SHIP CONTROL
XII. AN EMPIRICAL EVALUATION OF
QUICKENING IN A CONTACT ANALOG
DISPLAY
AD-257 361

U411 61 007
TRANSFER OF TRAINING AS A
FUNCTION OF TASK DIFFICULTY IN A
COMPLEX CONTROL SITUATION
AD-255 682

U411 61 102
SUBIC: SHIP CONTROL XIV
ADVANCED FBM SUBMARINE SHIP CONTROL
CONSOLE
AD-272 913

U417-66-024-VOL-1
ANALYTICAL INVESTIGATIONS OF
DIGITAL INFORMATION PROCESSING
SYSTEMS. VOLUME I.
AD-803 277

U-417-68-030
DIVER PERFORMANCE MEASUREMENT:
UNDERWATER NAVIGATION DEPTH
MAINTENANCE WEIGHT CARRYING
CAPABILITIES.
AD-674 528

U417-69-066
DIVER PERFORMANCE MEASUREMENT:
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