AD-684 450

A DDC BIBLIOGRAPHY

ACCELERATION TOLERANCE

VOLUME I OF II VOLUMES

DDC-TAS-68-81

FEBRUARY 1969

Unclassified and Unlimited

DEFENSE DOCUMENTATION CENTER
DEFENSE SUPPLY AGENCY

AD-684 450

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ACCELERATION TOLERANCE

Volume I of II Volumes

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FEBRUARY 1969

DEFENSE DOCUMENTATION CENTER
Cameron Station
Alexandria, Virginia 22314

P R E F A C E

The tolerance for acceleration has been studied by experimentation on the centrifuge using human and animal subjects. Body positioning relative to the direction of the increased gravitational forces was found to be critical. In an upright position, the gravitational shifts of blood may leave the brain cells without adequate blood and oxygen supply causing "grayout" or "blackout" at 4 to 6g. On the other hand, when the accelerating forces are encountered at a right angle to the longitudinal axis of the body, the general distribution of blood is less affected and g-loads up to ten to twelve times earth gravity can be tolerated for 2 to 3 minutes. Moving or lifting any part of the body against such high centrifugal forces is restricted, because of the disproportion between the appropriate muscle groups and the increased weight of the body parts. Respiration, which involves lifting the chest and/or abdominal cavity wall, will become a laborious task. In a recumbent or semirecumbent position, the astronaut's tolerance for acceleration is limited because of the severe oxygen lack developing in the most vitally important organic systems.

This bibliography compiles 99 unclassified and unlimited references of documents that have been cataloged in the DDC collection.

The following indexes are provided; the examples refer to citations that appear in this bibliography.

Subject Index

Asterisked descriptors that identify the most significant subjects of the report are arranged alphabetically in the subject index.

Example:

*ACCELERATION TOLERANCE
Effect of Headward and Forward
Accelerations on the Cardiovascular
System*
AD-255 298

Corporate Author/Monitoring Agency Index

This index arranges corporate authors and/or monitoring agencies alphabetically.

Example:

AFOSR-67-0871
An Inexpensive Variable - Radius
Centrifuge for Physiological
Experiments.
AD-650 331

Personal Author Index

This index contains entries arranged alphabetically by the last names of the authors of reports. When one author is responsible for several reports, the citations are arranged numerically by AD number.

Example:

*Brown, James H.
****

Acquisition and Retention of Nystagmic Habituation
In Cats with Distributed Acceleration Experience.
AD-633 705

AD-Numeric Index

This index contains the AD number and page location of each reference cited.

The unclassified and limited version of this bibliography includes the unclassified and unlimited references. Volume II of this bibliography appears as AD-850 750

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL

ROBERT B. STEGMAIER, JR.
Administrator
Defense Documentation Center

TABLE OF CONTENTS

Page

PREFACE.....iii

AD BIBLIOGRAPHIC REFERENCES.....1

INDEXES

CORPORATE AUTHOR/MONITORING AGENCY.....O-1

SUBJECT.....D-1

PERSONAL AUTHOR.....P-1

AD-NUMBER A-1

HOW TO ORDER BIBLIOGRAPHY REPORTS (Inside back cover)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-255 298
MAYO CLINIC ROCHESTER MINN
EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM (U)
JAN 61 1V WOOD,EARL H.;SUTTERER,WILLIAM F.;
CONTRACT: AF33 616 5938

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION TOLERANCE, *CARDIOVASCULAR SYSTEM, PHYSIOLOGY, RESPIRATION (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-287 737
DOUGLAS AIRCRAFT CO INC EL SEGUNDO CALIF
SOME NOTES ON THE PHYSIOLOGICAL TOLERANCE TO ACCELERATION (U)
FEB 61 IV LEVEDAHL,B.H.;
REPT. NO. ES 40253
CONTRACT: NONR107600

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •MAN, •PRIMATES, BLACKOUT (PHYSIOLOGY), CARDIOVASCULAR SYSTEM, DECELERATION, EJECTION SEATS, FATIGUE (PHYSIOLOGY), PHYSIOLOGY, POSTURE, SURVIVAL (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-260 949
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
ACCELERATION PROTECTION BY MEANS OF STIMULATION OF THE RETICULO-ENDOTHELIAL SYSTEM (U)
JUN 61 IV STIEHM,E.R.
REPT. NO. MA 6129

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION TOLERANCE, DOSAGE, LABORATORY ANIMALS, RETICULO-ENDOTHELIAL SYSTEM, STIMULATION, STRESS (PHYSIOLOGY), SURGERY, SURVIVAL, TOXINS + ANTITOXINS (U)

STIMULATION OF THE RATS' RETICULO-ENDOTHELIAL SYSTEM (RES) WAS EFFECTIVE IN ENHANCING THE TOLERANCES TO HIGH G ACCELERATION STRESS. UTILIZING IO DAILY CONSECUTIVE INTRAPERITONEAL INJECTIONS OF ENDOTOXIN AT INCREASING DOSES FROM IOO TO 1200 MICRO GRAMS, THE MEDIAN SURVIVAL TIME OF 122 RATS UNDERGOING 20 POSITIVE G ACCELERATION WAS INCREASED FROM A CONTROL LEVEL OF 9.7 MIN TO 14.2 MIN. ONE GROUP OF 48 RATS HAS A MEDIAN SURVIVAL OF 23.6 MIN COMPARED TO A CONTROL LEVEL OF 11.3 MIN. THE PROTECTIVE ACTION OF RES STIMULATION AND THE INHIBITORY ACTION OF RES BLOCKADE WAS EFFECTIVE IN RATS WITH NORMAL OR PROLONGED SURVIVAL BUT NOT IN RATS WITH DIMINISHED TOLERANCE BEFORE STIMULATINN OR BLOCKADE. AN ANALYSIS OF FACTORS FOR OPTIMAL RES STIMULATION IS PRESENTED AS ARE POSSIBLE MECHANISMS OF ACTION. (AUTHOR 0 (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-262 499
ARMED FORCES-NRC COMMITTEE ON BIO-A..RONAUTICS WASHINGTON D C
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE (U)
APR 60 1V GUEDRY,FREDERICK E.;GRAYBIEL,ASHTON;
REPT. NO. P902

UNCLASSIFIED REPORT

DESCRIPTORS: •AVIATION MEDICINE, •FLIGHT SIMULATORS, •PHYSIOLOGY, •ROTATION, •STRESS (PHYSIOLOGY), ACCELERATION, ACCELERATION TOLERANCE, BIOPHYSICS, FLIGHT, SPACE ENVIRONMENTAL CONDITIONS, SPACE FLIGHT, SPACE MEDICINE (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-266 076
ARMED FORCES-NRC COMMITTEE ON BIO-ASTRONAUTICS WASHINGTON D C
HUMAN ACCELERATION STUDIES (U)
DEC 61 1V BATES,GEORGE;CLARK,CARL C.;
REPT. NO. 917

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION, *INDEXES, *VOCABULARY, ACCELERATION TOLERANCE, CENTRIFUGES, SPACE MEDICINE, TEST EQUIPMENT (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-266 077
ARMED FORCES-NRC COMMITTEE ON BIO-ASTRONAUTICS WASHINGTON D C
REPORTS ON HUMAN ACCELERATION (U)
DEC 61 1V HIATT,EDWIN P.;MEEHAN,J.P.; GALAMBOS,ROBERT;
REPT. NO. 901

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •REPORTS, MAN, PATHOLOGY, PHYSIOLOGY, SAFETY, SENSORY MECHANISMS, STRESS (PHYSIOLOGY), STRESS (PSYCHOLOGY), TEST METHODS, TESTS, THRESHOLDS (PHYSIOLOGY), VISION, WOUNDS + INJURIES (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-266 078
ARMED FORCES-NRC COMMITTEE ON BIO-ASTRONAUTICS WASHINGTON D C
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT). A DESCRIPTION OF FACILITIES IN USE AND PROPOSED (U)
DEC 61 IV VON GIERKE,HENNING E.;
STEINMETZ,EUGENE;
REPT. NO. 903

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •MAN, •OSCILLATORS, •TEST FACILITIES, AIR BURST, DECELERATION, IMPACT SHOCK, LINEAR ACCELERATORS, MOTHERS, MOTION SICKNESS, PARTICLE ACCELERATORS, PHYSIOLOGY, TEST EQUIPMENT, VIBRATION, VOLUME (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-268 189
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES SCHOOL OF MEDICINE
THE EFFECTS OF TRANSVERSE ACCELERATIONS AND EXPONENTIAL TIME-LAG CONSTANTS ON COMPENSATORY TRACKING PERFORMANCE (U)
SEP 61 IV KASHLER,RICHARD C.;
CONTRACT: AF33 616 5407
MONITOR: ASO TR61 457

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •RECORDING SYSTEMS, ANALYSIS OF VARIANCE, ERRORS, HUMAN ENGINEERING, MAN, MEASUREMENT, PHOSPHONITRILE CHLORIDES, REACTION (PSYCHOLOGY), REFLEXES, ROLL, STRESS (PHYSIOLOGY) (U)

A STUDY WAS CONDUCTED TO DETERMINE THE EFFECTS AND INTERACTIONS OF FRONT-TO-BACK TRANSVERSE ACCELERATIONS, IN THE MAGNITUDES OF 0, 3 G, AND 6 G, AND EXPONENTIAL TIME-LAG CONSTANTS OF 0.1, 1.0 AND 2.0 SECONDS ON HUMAN CONTROL PERFORMANCE ON A COMPENSATORY TRACKING TASK. IN GENERAL, THE RESULTS SUBSTANTIATED PREDICTIONS OF HUMAN TRACKING PERFORMANCE BASED ON HELSON'S U-HYPOTHESIS AND PRINCIPLE OF GENERALITY. CONCEPTS FROM INFORMATION THEORY ARE INTRODUCED TO EXPLAIN CERTAIN LEARNING PHENOMENA WHICH OCCURRED IN THE COURSE OF THE EXPERIMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-268 791
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE (U)
SEP 61 IV KENNEDY,ROBERT S.;GRAYBIEL,ASHTON;
REPT. NO. 62

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •MOTION SICKNESS, •SPACE MEDICINE, MAN, ROTATION, STIMULATION, STRESS (PHYSIOLOGY) (U)

EIGHT SUBJECTS WERE SYSTEMATICALLY OBSERVED ON CERTAIN TASKS ABOARD THE PENSACOLA SLOW ROTATION ROOM AT A VELOCITY OF ONE RPM. PILOT EXPERIMENTS INDICATED THE GREAT MAJORITY OF UNSELECTED SUBJECTS WOULD BE SYMPTOM FREE AT THIS SPEED. CONSEQUENTLY, FOUR SUBJECTS WERE SELECTED WHOSE SUSCEPTIBILITY TO CANAL SICKNESS AND MOTION SICKNESS WAS FAR ABOVE AVERAGE. THE FINDINGS WARRANTED THE CONCLUSION THAT UNDER THE CONDITIONS OF THIS EXPERIMENT, EXPOSURE TO A CONSTANTLY ROTATING ENVIRONMENT ON ONE RPM DOES NOT HANDICAP THE PERFORMANCE OF PERSONS WITH FAR GREATER THAN AVERAGE SUSCEPTIBILITY TO CANAL SICKNESS. (U)

UNCLASSIFIED

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-268 793
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT (U)
AUG 61; IV GUEDRY,F.E. JR.;GRAYBIEL,A.;
REPT. NO. 61

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION TOLERANCE, *CONDITIONED REFLEX, *EYE, *ROTATION, STRESS (PHYSIOLOGY), TESTS (U)

SEVEN MEN LIVED IN A ROTATING ROOM (5.4 RPM) FOR 64 HOURS. CONTROLLED TESTS BEFORE AND DURING THIS INTERVAL DEMONSTRATED THAT CORIOLIS VESTIBULAR PHENOMENA INCLUDING CORIOLIS NYSTAGMUS DIMINISHED MARKEDLY. A COMPENSATORY NYSTAGMUS, INDUCED BY HEAD OR WHOLE BODY MOVEMENTS, WAS RECORDED MORE THAN ONE HOUR AFTER THE ROTATION HAD CEASED. FACTORS OF POSSIBLE SIGNIFICANCE IN CONDITIONING THE COMPENSATORY NYSTAGMUS ARE: (1) OTOLITH AND PROPRIOCEPTOR SENSORY INFLUX PRIOR TO AND DURING DISCORDANT CANAL INPUT; (2) A CONSISTENT SENSORY INFLUX FOR EACH STIMULUSPRODUCING MOVEMENT; (3) INTENTION IN STIMULUSPRODUCING MOVEMENTS; AND (4) VISUAL INHIBITION. CONTRIBUTIONS OF COMPENSATORY AND AROUSAL FACTORS TO VESTIBULAR SUPPRESSION ARE CONSIDERED IN RELATION TO PRACTICAL PROBLEMS OF TRANSFER OF HABITUATION FROM ONE ACCELERATION ENVIRONMENT TO ANOTHER. (AUTHOR) (U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-269 488
NAVAL AIR OEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEOICAL ACCELERATION LAB
INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-OIMETHYLAMINOETHYL P-CHLOROPHENOXYACETATE (LUCIORIL) (U)
NOV 61 1V POLIS,B. OAVIO;
REPT. NO. 6136

UNCLASSIFIEO REPORT

OESCRIPTORS: •ACCELERATION TOLERANCE, •CHEMOTHERAPEUTIC AGENTS, •ORUGS, •PHARMACOLOGY, ACETAES, PHENOXY RAOICALS, STRESS (PHYSIOLOGY), SURVIVAL (U)

THE OIMETHYLAMINOETHYL ESTER OF PARACHLOROPHENOXYACETIC ACIO ENHANCEO SIGNIFICANTLY THE TOLERANCE OF RATS TO ACCELERATION AT 20 G. THE MEOIAN SURVIVAL TIME OF TREATEO ANIMALS INCREASED TO 33.3 MIN, ALMOST A THREEFOLO INCREMENT. THE EFFECTIVENESS PERSISTEO ONLY FOR A PERIOO OF 4 HRAFTER INJECTION. A LATENT PERIOO OF 3 TO 4 DAYS TREATMENT SEEMED NECESSARY BEFORE THE ENHANCED TOLERANCE TO ACCELERATION BECAME APPARENT. THE ACTIVITY OF THE ORUG WAS OOSE-OEPENOENT IN THAT NO SIGNIFICANT CHANGES IN ACCELERATION TOLERANCE WERE FOUNO WITH A TOTAL INJECTION OF 50 MG; SIGNIFICANT INCREMENTS IN TOLERANCE WERE OBTAINEO WITH 75 MG OF THE ORUG; MUCH LARGER INCREASES IN THE TOLERANCE TO ACCELERATION FOLLOWEO AOMINISTRATION OF 100 MG OF LUCIORIL. THE NATURE OF THE PHARMACOLOGIC EFFECT SUGGESTS THAT THE ORUG ACTION PER SE IS MEOIATEO VIA THE HYPOTHALAMIC AREA OF THE BRAIN, POSSIBLY IN INTERPLAY WITH THE BIOGENIC AMINES. THE LOW TOXICITY OF THE ORUG ANO THE FACT THAT IT HAS ALREAOY BEEN USEO IN HUMANS IN HIGH OOSES WITH NO OELETERIOUS ANO SOME PRESUMPTIVE BENEFICIAL EFFECTS LEAOS TO THE PROPOSAL THAT THE COMPOUNO MIGHT BE EFFECTIVE IN INCREASING HUMAN TOLERANCE TO ACCELERATION STRESS. (AUTHOR) (U)

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ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AO-269 651
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
BEFORE A MANNED FLIGHT (U)
AUG 61 1V GIL'BERT,L.I
REPT. NO. MCL 1280

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION, *DECELERATION, CENTRIFUGES, GRAVITY, MANNED, PHYSIOLOGY, ROCKET PROPELLED SLEDS, SIMULATION, SPACE FLIGHT, SPACECRAFT, WEIGHTLESSNESS (U)
IDENTIFIERS: USSR (U)

THE EFFECT OF G-FORCES (ACCELERATION AND DECELERATION) AND OF WEIGHTLESSNESS ARE DISCUSSED; TEST EQUIPMENT ARE ALSO MENTIONED. (U)

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-272 332
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
RESPONSE OF MAMMALIAN GRAVITY RECEPTORS TO SUSTAINED TILT (U)

IV CRAMER,ROBERT L.;

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION TOLERANCE, *EAR, NERVES, PROPRIOCEPTION, STIMULATION, STRESS (PHYSIOLOGY), WEIGHTLESSNESS (U)

STUDIES WERE MADE OF THE BEHAVIOR OF SINGLE CELLS OF THE PROJECTIONS OF THE OTOLITH ORGANS IN DECEREBRATE AND DECELLEBRATE CAT AS THE PREPARATION WAS MAINTAINED FOR EXTENDED TIMES IN DIFFERENT POSITIONS RELATIVE TO THE EARTH'S GRAVITATIONAL FIELD. IN EVERY CASE STUDIED, IT WAS FOUND THAT THERE WAS A RATHER VIGOROUS INITIAL RESPONSE TO THE TILT AND THAT THIS RESPONSE DIMINISHED CONSIDERABLY OVER 15 TO 20 SECONDS; THE STEADY-STATE SIGNAL TO TILT WAS RELATIVELY WEAK. (AUTHOR) (U)

UNCLASSIFIED

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOD529

AD-282 883
AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
THE PHYSIOLOGICAL RESPONSES OF CHIMPANZEES TO
SIMULATED LAUNCH AND RE-ENTRY ACCELERATIONS (U)
JUL 62 IV STINGELY,NORMAN E.;
REPT. NO. TDR62 11

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION TOLERANCE, *PRIMATES, *SIMULATION, ATMOSPHERE ENTRY, BLOOD VESSELS, HEART, INSTRUMENTATION, MEASUREMENT, NOISE, RESPIRATION, RESPIRATORY SYSTEM, URINARY SYSTEM, VIBRATION, WEIGHTLESSNESS (U)
IDENTIFIERS: MERCURY PROJECT (U)

FIVE MALE CHIMPANZEE SUBJECTS WERE EXPOSED TO SIMULATED SPACE FLIGHT CONDITIONS OF LAUNCHACCELERATION AND ATMOSPHERIC RE-ENTRY DECELERATION. HEART AND RESPIRATION RATES SHOWED SIGNIFICANT DIFFERENCES FOR THE THREE CONDITIONS OF LAUNCH. THE CONDITIONS OF LAUNCH WERE: LAUNCH ACCELERATION ONLY, LAUNCH ACCELERATION WITH VIBRATION AND NOISE, AND LAUNCH ACCELERATION WITH NOISE, VIBRATION, URINARY TRACT CATHETERIZATION AND ARTERIAL AND VENOUS CATHETERIZATIONS. PHYSIOLOGICAL RESPONSES ASSOCIATED WITH LAUNCH AND RE-ENTRY DIFFERED SIGNIFICANTLY FROM THE BASELINE PERIOD THAT PRECEDED EACH OF THE LAUNCHES. PHYSIOLOGICAL CHANGES ASSOCIATED WITH RE-ENTRY WERE NOT AS SEVERE AS THOSE SEEN WITH LAUNCH. THE SUBJECTS RECOVERED FROM THE ENVIRONMENTAL STRESSORS OF BOTH LAUNCH AND RE-ENTRY VERY RAPIDLY. THE RESULTANT RESPONSES SHOULD BE GOOD PREDICTORS OF CHIMPANZEE CARDIAC AND RESPIRATORY ACTIVITY DURING THE CRITICAL ACCELERATION PHASES OF SPACE FLIGHT AND ALSO SERVE AS A BASELINE FOR THE STUDY OF THE EFFECTS OF WEIGHTLESSNESS FOLLOWING LAUNCH ACCELERATION AND PRIOR TO RE-ENTRY DECELERATION. (AUTHOR) (U)

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ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-286 930
TRW SPACE TECHNOLOGY LABS REDONDO BEACH CALIF
PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF SPACE FLIGHT: A BIBLIOGRAPHY. VOLUME I. ACCELERATION, DECELERATION, AND IMPACT (U)
IV PRICE,J.F.;

UNCLASSIFIED REPORT

DESCRIPTORS: *ACCELERATION, *ACCELERATION TOLERANCE, *BIBLIOGRAPHIES, *DECELERATION, *SPACE FLIGHT, IMPACT SHOCK, MAN, SPACE MEDICINE, STRESS (PHYSIOLOGY), STRESS (PSYCHOLOGY), WEIGHTLESSNESS (U)

A BIBLIOGRAPHY OF 1020 ANNOTATED REFERENCES ON ACCELERATION, DECELERATION, AND IMPACT STUDIES.

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-287 996
AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO
DESCRIPTION AND PERFORMANCE EVALUATION OF THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR (U)

IV LOWRY,R.O.;WOLFF,W.M.;

REPT. NO. TR61 743
MONITOR: ASD TR61 743

UNCLASSIFIED REPORT

DESCRIPTORS: •IMPACT SHOCK, •TEST FACILITIES, •VIBRATORS (MECHANICAL), ACCELERATION, SPACE MEDICINE, VIBRATION (U)

THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR WAS DEVELOPED FOR BIOASTRONAUTICS RESEARCH TO SIMULATE VIBRATION AND BUFFETING ENCOUNTERED IN AEROSPACE OPERATIONS. THE DESIGN, MOTION CAPABILITIES, CONTROL AND SAFETY FEATURES ARE DESCRIBED. THIS VERTICAL ACCELERATOR CAN BE PROGRAMMED WITH PERIODIC OR RANDOM ACCELERATION PATTERNS OBTAINED FROM ACTUAL ENVIRONMENTAL MEASUREMENTS. IT IS A COMPLEX ELECTROMECHANICAL DEVICE EMPLOYING A UNIQUE TYPE OF FRICTION DRIVE TO MOVE A TEST PLATFORM WITH A 200-LB LOAD CAPACITY. THE ACCELERATOR, FOR CONTINUOUS OPERATION, CAN PRODUCE PEAK TO PEAK AMPLITUDES WITHIN 5 FT OVER THE FREQUENCY RANGE FROM 0.5 CPS TO 10 CPS. THE MAXIMUM ACCELERATION OUTPUT IS FROM 2.5 TO 3 G DEPENDING ON LOAD AND PERMISSIBLE DISTORTION. (AUTHOR) (U)

UNCLASSIFIED

DDC REFORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AO-288 979
LIBRARY OF CONGRESS WASHINGTON D C AEROSPACE TECHNOLOGY DIV
STANDARDIZATION OF CONSTANTS FOR AGE ESTIMATION BY THE ARGON METHOD (U)
AUG 62 1V
REPT. NO. 62 114

UNCLASSIFIED REPORT

DESCRIPTORS: •ACCELERATION TOLERANCE, •GEOLOGY, ARGON (U)

STANDARDIZATION OF CONSTANTS FOR AGE ESTIMATION BY THE ARGON METHOD.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 200529

AD-420 258
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
THE EFFECT OF SEX ON THE G TOLERANCE OF RATS, (U)
AUG 63 10P REEVES,ELIZABETH I
PROJ: MR005 13 0002 3
MONITOR: NADC MA 6313

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, SEX), (*SEX, ACCELERATION TOLERANCE), RATS, AGING (PHYSIOLOGY), WEIGHT, STRESS (PHYSIOLOGY), REPRODUCTIVE YSTEM, SURVIVAL, PHYSIOLOGY (U)
IDENTIFIERS: 1963 (U)

THREE GROUPS OF RATS WERE TESTED ON THE CENTRIFUGE AT 20 POSITIVE G TO ASCERTAIN WHAT EFFECT SEX MIGHT HAVE ON THE G TOLERANCE OF RATS. THE THREE GROUPS WERE: (1) AN EXPERIMENTAL GROUP OF 50 FEMALE RATS OF ABOUT 4-1/2 MONTHS OF AGE AT TIME OF CENTRIFUGATION, (2) A CONTROL GROUP OF 50 MALE RATS OF THE SAME AGE AND (3) A CONTROL GROUP OF 69 MALE RATS OF ABOUT THE SAME WEIGHT AS THE FEMALE EXPERIMENTAL GROUP. THE EXPERIMENT WAS PERFORMED TO DETERMINE ANY DIFFERENCES BETWEEN: (1) FEMALE AND MALE RATS OF THE SAME AGE, (2) FEMALE AND MALE RATS OF THE SAME WEIGHT, (3) FEMALE RATS IN THE ESTROUS AS OPPOSED TO THE DIESTROUS PHASE OF THE ESTRUS CYCLE AND (4) FEMALE RATS IN THE ESTROUS OR DIESTROUS PHASE AS COMPARED TO MALE RATS OF THE SAME AGE OR SAME WEIGHT. NO SIGNIFICANT DIFFERENCES WERE NOTED BETWEEN THE GROUPS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-420 284
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
THE EFFECT OF AGEING ON THE G TOLERANCE OF RATS. II. A COMPARISON AT ONE MONTH WITH SURVIVORS AT THREE MONTHS OF AGE, (U)
AUG 63 7P REEVES,ELIZABETH ;
MONITOR: NADC MA 6314

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, MEDICAL RESEARCH), AGING (PHYSIOLOGY), STRESS (PHYSIOLOGY), RATS, SURVIVAL (U)
IDENTIFIERS: 1963 (U)

A PRELIMINARY STUDY INDICATED THAT YOUNG RATS HAVE A GREATER RESISTANCE TO ACCELERATION STRESS OF 20 POSITIVE G THAN DO MORE MATURE RATS. THE PRESENT STUDY COMPARED THE TOLERANCE OF ONEMONTH OLD RATS WITH THREE-MONTH OLD RATS AT 20 POSITIVE G AND FOUND THAT THERE WAS A SIGNIFICANT DIFFERENCE IN FAVOR OF THE ONE-MONTH OLD ANIMALS. TWENTY RATS, WHICH SURVIVED THE INITIAL CENTRIFUGATION AT ONE MONTH OF AGE WERE RETESTED AT THREE MONTHS AND SHOWED NO SIGNIFICANT DIFFERENCE IN TOLERANCE WHEN COMPARED WITH CONTROL RATS ON THE SAME AGE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-424 030
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT, (U)
OCT 63 29P CHAMBERS,RANDALL M. ;
NELSON,JOHN G. ;
MONITOR: NADC MA ,NAVMED 63083 ,MR005 13 6002 4,
REPT. NO. 3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CENTRIFUGES, ACCELERATION TOLERANCE), (*MONITORS, CENTRIFUGES), (*INSTRUMENTATION, SPACE MEDICINE), TRAINING, MEDICAL RESEARCH, PHYSIOLOGY, PILOTS, MEASUREMENT, PERFORMANCE TESTS, BEHAVIOR, PSYCHOLOGY (U)
IDENTIFIERS: 1963, HUMAN CENTRIFUGE, BIOINSTRUMENTATION, BIOMEDICAL MONITORING, X-20 SPACECRAFT, TOLERANCES (PHYSIOLOGY), PERFORMANCE (HUMAN) (U)

THIS REPORT PRESENTS SOME OF THE RESULTS OF RECENT CENTRIFUGE ACCELERATION RESEARCH AND TRAINING PROJECTS IN WHICH THE BIOMEDICAL, PSYCHOPHYSIOLOGICAL, AND PSYCHOLOGICAL PERFORMANCES OF PILOTS WERE MONITORED AND MEASURED. MONITORING AND RECORDING INSTRUMENTATION TECHNIQUES ARE DESCRIBED, AND AN ATTEMPT IS MADE TO IDENTIFY AND QUANTIFY SOME OF THE CAPABILITIES AND LIMITATIONS OF PILOT PERFORMANCE DURING EXPOSURE TO ACCELERATIONS WHICH VARY IN MAGNITUDE, DURATION, DIRECTION, RATE OF ONSET, AND PROFILE COMPLEXITY. APPARATUS AND METHODS ARE PRESENTED AND DISCUSSED FOR MONITORING VISUAL DISTRUBANCE, DISCRIMINATION AND RESPONSE BEHAVIOR, COMPLEX SKILL BEHAVIOR, AND AN APPROACH IS MADE TO THE PROBLEM OF MONITORING HIGHER MENTAL FUNCTIONING, THE PILOTS AND OTHER VOLUNTEERS IN THESE TRAINING AND RESEARCH PROGRAMS WERE THE 7 MERCURY ASTRONAUTS, 6 DYNA-SOAR CONSULTANT PILOTS, APPROXIMATELY 39 OTHER TEST PILOTS, AND APPROXIMATELY 40 OTHER MILITARY AND CIVILIAN VOLUNTEERS. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-424 922
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
THE EFFECT OF POSITIVE PRESSURE BREATHING ON ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION IN SUBJECTS EXPOSED TO HIGH TRANSVERSE ACCELERATION, (U)
21P REED,JOHN H. ,JR.;
BURGESS,B. F. ,JR.;SANDLER,HAROLD ;
MONITOR: NADC MA 6323

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PRESSURE BREATHING, OXYGEN CONSUMPTION), ACCELERATION TOLERANCE, ARTERIES, ELECTROCARDIOGRAPHY, PHYSIOLOGY, SPACE MEDICINE, RESPIRATION, STRESS (PHYSIOLOGY), ACCELERATION, CENTRIFUGES, MAN (U)
IDENTIFIERS: OXYGEN SATURATION, 1963 (U)

TWENTY-TWO CENTRIFUGE RUNS WERE PERFORMED ON EIGHT SUBJECTS IN WHOM ARTERIAL OXYGEN SATURATION WAS CONTINUALLY MONITORED, WHILE THE SUBJECTS WERE EXPOSED TO VARIOUS TRANSVERSE ACCELERATIONS +GX AT A SEAT ANGLE OF 6 DEGREES HEAD UP. THESE RUNS WERE MADE DURING CONDITIONS OF BREATHING: AIR, AIR POSITIVE PRESSURE, PURE OXYGEN, AND PURE OXYGEN POSITIVE PRESSURE. THE POSITIVE PRESSURE WAS METERED AUTOMATICALLY TO PROVIDE 3 MM HG PER G ABOVE AMBIENT PRESSURE. THE RESULTS OF THIS EXPERIMENT SHOW THAT THE SLOPE OF THE CURVE OF OXYGEN SATURATION PLOTTED AGAINST TIME FOR AIR AND AIR POSITIVE PRESSURE DECREASED APPROXIMATELY 3 PERCENT EVERY 10 SECONDS, BEGINNING 10 TO 20 SECONDS AFTER THE ONSET OF THE ACCELERATION. DURING THE OXYGEN BREATHING STUDIES, A LOWERING IN ARTERIAL OXYGEN SATURATION WAS OBSERVED APPROXIMATELY 100 SECONDS AFTER THE ONSET OF ACCELERATION. A METHOD IS SUGGESTED FOR ESTIMATING PHYSIOLOGICAL LIMITS FOR THEORETICAL PROFILES OF ACCELERATION G PLOTTED AGAINST TIME. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-426 900
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM DURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME AND INTENSITY, DIRECTED ALONG THE SPINE BREAST AXIS, (U)
DEC 63 IIP BARER,A.A.;GOLOV,G.A.;
MONITOR: FTD TT63 1095

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY, NO. 7, PP. 24-29, 1963.

DESCRIPTORS: (*ACCELERATION TOLERANCE, MAN), (*PHYSIOLOGY, ACCELERATION TOLERANCE), RESPIRATION, REACTION (PSYCHOLOGY), CARDIOVASCULAR SYSTEM, VISUAL ACUITY, ELECTROENCEPHALOGRAPHY, AVIATION MEDICINE. (U)
IDENTIFIERS: ELECTROMYOGRAPHY, 1963, LONGITUDINAL AXIS. (U)

TRANSLATION OF FOREIGN RESEARCH ON THE PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM OURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME ANO INTENSITY, OIRECTED ALONG THE SPINEBREAST AXIS.

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AO-429 027
FROST ENGINEERING DEVELOPMENT CORP DENVER COLO
HUMAN BODY DYNAMICS UNDER SHORT-TERM ACCELERATION. (U)
64P
REPT. NO. IIS 2
CONTRACT: N167 19747X

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, MATHEMATICAL MODELS), MODELS (SIMULATIONS), THEORY DYNAMICS, MAN, EXPERIMENTAL DATA, POSTURE, ANALOG COMPUTERS, BIOPHYSICS (U)

THIS REPORT REVIEWS THE DEVELOPMENT OF THE THEORY OF BODY DYNAMICS AND SHOWS HOW IT CAN BE USED TO OBTAIN SOLUTIONS TO IMPORTANT ENGINEERING PROBLEMS. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-430 032
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE EFFECT OF TRANSVERSE ACCELERATION ON OXYGEN TENSION IN BRAIN TISSUE, (U)
JAN 64 12P KOVALENKO,YE. A. ;POPKOV,V. L. ;CHERNYAKOV,I. N.;
MONITOR: FTD TT63 1219

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM FIZIOLOGICHESKIY ZHURNAL SSSR IM. I. M. SECHENOVA, 49:10, PP. 1145-1149, 1963.

DESCRIPTORS: (*ACCELERATION TOLERANCE, BRAIN), POSTURE, HYPOXIA, ELECTROENCEPHALOGRAPHY, DOGS, PHYSIOLOGY (U)
IDENTIFIERS: TRANSVERSE ACCELERATION, 1963 (U)

TRANSLATION OF FOREIGN RESEARCH ON THE EFFECT OF TRANSVERSE ACCELERATION ON OXYGEN TENSION IN BRAIN TISSUE.

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO329

AD-431 208
MAYO CLINIC ROCHESTER MINN
PHOTOELECTRIC EARPIECE RECORDINGS AND OTHER PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION (+GZ) PRODUCED BY PARTIAL IMMERSION IN WATER. (U)
DEC 63 19P WOOD,EARL H. ; LINDBERG,EVAN F. ;COOE,CHARLES F.;BALDES,E. J. ;
CONTRACT: AF33 616 7594
PROJ: 7222
MONITOR: AMRL TOR63 106

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, PHYSIOLOGY), (*MODELS (SIMULATIONS), ACCELERATION), UNDERWATER, INSTRUMENTATION, CENTRIFUGES, PHOTOELECTRIC MATERIALS, ELECTROCARDIOGRAPHY, POSTURE, VISION, PSYCHOMETRICS, CARDIOVASCULAR SYSTEM, ANALYS S OF VARIANCE, EAR, BLOOD CIRCULATION, MAN, RECORDING SYSTEMS, AUDIOMETRY, REACTION (PSYCHOLOGY) (U)
IDENTIFIERS: WATER IMMERSION, EARPIECE RECORDER, 1963 (U)

THE PROTECTION AGAINST THE EFFECTS OF HEADWARD ACCELERATION AFFORDED THE HUMAN BY HIS IMMERSION IN WATER TO THE LEVEL OF THE XYPHOID AND TO THE THIRD RIB AT THE STERNUM HAS BEEN ASSAYED IN 15 TRAINED CENTRIFUGE SUBJECTS. VARIATIONS IN EAR OPACITY, EAR OPACITY PULSE, HEART RATE, RESPIRATION AND REACTION TIMES TO AUDITORY AND VISUAL STIMULI WERE RECORDED CONTINUOUSLY IN A SERIES OF 15 SUBJECTS DURING 15-SECOND EXPOSURES TO ACCELERATION WHILE SEATED IN A STEEL TUB MOUNTED IN THE COCKPIT OF THE MAYO CENTRIFUGE. NO SYSTEMATIC ALTERATIONS IN THE GENERAL PATTERN, CHARACTERIZED BY A PERIOD OF FAILURE DURING THE FIRST 5 TO 10 SECONDS FOLLOWED BY CARDIOVASCULAR COMPENSATION AND RECOVERY FROM VISUAL SYMPTOMS DURING THE LATTER PART OF THE EXPOSURE WERE OBSERVED DURING IMMERSION IN WATER. THE DECREMENTS IN EAR OPACITY ASSOCIATED WITH THE VARIOUS DEGREES OF VISUAL IMPAIRMENT WERE CLOSELY SIMILAR; HOWEVER, THE DECREMENTS IN EAR OPACITY PULSE AND INCREMENTS IN HEART RATE WERE SIGNIFICANTLY LESS DURING IMMERSION IN WATER THAN WHEN IN AIR. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-438 489
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION, (U)
APR 64 22P SQUIRES,RUSSELL D. ; JENSEN,R. E. ;SIPPLE,W. C. ;GORDON,J. J. ;
MONITOR: NADC MA ,NAVMED 6402, ,MROOS 13 0002 2, R12

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ELECTROENCEPHALOGRAPHY, BLACKOUT (PHYSIOLOGY)), (*ACCELERATION TOLERANCE, ELECTROENCEPHALOGRAPHY), ELECTRONIC EQUIPMENT, BRAIN, HYPOXIA, AVIATION MEDICINE, BLOOD PRESSURE, PERFORMANCE (HUMAN), BAND PASS FILTERS, FREQUENCY ANALYZERS (U)
IDENTIFIERS: CONSCIOUSNESS (U)

EACH OF 13 HUMAN SUBJECTS WAS SUBJECTED ALTERNATELY TO A SET OF PEAK ACCELERATIONS OF 6 AND 7 G ON TWO SEPARATE OCCASIONS. PEAK G WAS ATTAINED IN APPROXIMATELY 30 SECONDS AFTER THE INITIATION OF A SYMMETRICAL, SINUSOIDAL ACCELERATION PROFILE. THE BEST INDEX OF THE LEVEL OF CONSCIOUSNESS APPEARS TO BE THE INVERSE RELATIONSHIP BETWEEN THE DEPTH OF BLACKOUT AND THE AMPLITUDE OF EEG FREQUENCIES IN THE RANGE OF 5 CPS. THE LOWER DELTA FREQUENCIES WERE NOT USED SINCE ARTIFACTS DUE TO ELECTRODE DISPLACEMENT RESULTING FROM HEAD MOVEMENT WERE SEEN MOST FREQUENTLY IN THIS RANGE OF FREQUENCIES. MOREOVER, THE 5 TO 7 CPS. FREQUENCY BAND IS ASSOCIATED WITH CEREBRAL HYPOXIA WHICH OCCURS DURING POSITIVE ACCELERATION. THIS FREQUENCY BAND WAS ALSO SHOWN TO BE RELATED TO PERFORMANCE OF SPECIFIC PERFORMANCE TASKS. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AO-457 349
AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
DYNAMIC RESPONSE ANALYSIS OF +GX IMPACT ON MAN, (U)
NOV 64 45P FEDER,H. C. ;ROOT,E. H. ;
REPT. NO. ARL TR64 11
PROJ: 7231
TASK: 723106

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (+STRESS (PHYSIOLOGY), DECELERATION), (+DECLERATION, MEASURING DEVICES (ELECTRICAL + ELECTRONIC)), REACTION (PSYCHOLOGY), BIOPHYSICS, TEST METHODS, TEST EQUIPMENT, ANATOMICAL MODELS, MODELS (SIMULATIONS), IMPACT SHOCK, ACCELEROMETERS, ANALOG SYSTEMS, ANALOG COMPUTERS, SPACE MEDICINE, HUMANS, THORAX (U)

AN ANALOG COMPUTER WAS USED TO COMPARE THE DYNAMIC RESPONSE OF AN ACCELEROMETER PLACED OVER THE STERNUM OF HUMAN TEST SUBJECTS OURING IMPACT IN +G SUB X DIRECTION WITH THE RESPONSE OF SECOND AND HIGHER ORDER SPRING-MASS SYSTEMS. IDENTITY OF THE RESPONSE MODES OF BOTH SYSTEMS, HUMAN AND MECHANICAL, WAS APPROXIMATED BY TRIAL AND ERROR MODIFICATION OF NATURAL FREQUENCY AND DAMPING COEFFICIENT OF THE COMPUTER MODEL USED. WITH RESTRICTION TO ONLY A FEW CASES INVESTIGATED AND TO THE PARTICULAR TEST CONDITIONS, BEST COMPLIANCE OF COMPLETE RESPONSE COVERAGE IS CONSIDERED TO RESULT FROM THE APPLICATION OF A SINGLE SPRING-MASS SYSTEM OF IRREGULARLY VARYING DAMPING COEFFICIENT. A PARAMETRIC ANALYSIS OF THE SINGLE SPRING-MASS SYSTEM IS PRESENTED TO AID THE USE OF STANDARDIZED IMPACT PROFILES. THE USEFULNESS OF THE METHOD OF RESPONSE APPROXIMATION HAS BEEN ESTABLISHED, BUT THE VALIDATION OF THE UNDERLYING CONCEPT OF RESPONSE PREDICTABILITY NEEDS FURTHER INVESTIGATION. (AUTHOR) (U)

DDC REPORT BIBLIDGRAPHY SEARCH CONTROL NO. Z00529

AD-472 550
DOUGLAS AIRCRAFT CO INC SANTA MONICA CALIF MISSILE AND SPACE SYSTEMS DIV
BIDMEDICAL PDTENTIAL DF A CENTRIFUGE IN AN ORBITING LABDRATDRY. (U)
DESCRIPTIVE NDTE: FINAL REPT. SEP 64-FEB 65, JUL 65 122P WHITE ,W. J. INYBERG ,J. W. IWHITE ,P. D. IGRIMES ,R. H. IFINNEY,L. H. I

REPT. ND. SM-48502
CONTRACT: AF04 695 679
MONITOR: SSD TDR-64-209-SUPPL.

UNCLASSIFIED REPORT

SUPPLEMENTARY NDTE: SUPPLEMENT TO REPT. NO. TDR-64-209.

DESCRIPTORS: (•CENTRIFUGES, •SPACE MEDICINE), SPACE STATIDNS, ACCELERATION, STRESS(PHYSIOLDGY), WEIGHTLESSNESS, WEIGHT, HUMANS, GRAVITY, EXERCISE, CARDIDVASCULAR SYSTEM, SPACE ENVIRONMENTAL CONDITIONS, SIMULATION, SPACE CREWS, MAINTENANCE PERSDNNEL, MANNED SPACECRAFT, ACCELERATIDN TDLERANCE (U)

FIVE STUDIES CONCERNING THE POTENTIAL OF A CENTRIFUGE IN AN ORBITAL LABDRATORY WERE CDNDUCTED. THE FIRST THREE STUDIES INCLUDE CONSEQUENCES DF HEART-TO-FODT GRADIENTS DN TOLERANCE TO POSITIVE ACCELERATIDN, A PARAMETRIC STUDY DF THE POWER REQUIREMENTS OF A SHORT RADIUS CENTRIFUGE, AND A TECHNIQUE UTILIZING THE CENTRIFUGE FDR DETERMINING BODY MASS IN A NULL GRAVITY STATE. THE SALIENT GENERALIZATION FRDM STUDIES IN WHICH BED REST WAS USED AS THE ANALOG DF NULL GRAVITY WERE PRESENTED. THE FOURTH STUDY WAS CDNDUCTED TD STUDY THE INFLUENCE DF PERIDDIC CENTRIFUGATION AS A METHOD DF ALLEVIATING PHYSIDLOGICAL DISTURBANCES, WITH EMPHASIS DN THE CARDIDVASCULAR SYSTEM, BRDUGHT ABOUT BY 20 DAYS DF BED REST. IT WAS SHDWN THAT MOTIDN SICKNESS IN THE SUBJECTS WAS NOT A PROBLEM WHEN EXPDSED TO HIGH ANGULAR RATES OF ROTATION. DETERIDRATION PRODUCED BY RECUMBENCY WAS ALLEVIATED BY PERIDDIC CENTRIFUGATION, AND SUBJECTS EXPOSED TO +4GZ FOUR TIMES DAILY SHOWED LESS LABILITY OF BLDOD PRESSURE THAN DID THOSE RECEIVING LESS ACCELERATIDN. THE FIFTH STUDY EXTENDED THE RESULTS DF THE FDURTH STUDY BY INCREASING THE INTEGRATED G-TIME, ADDED APPROXIMATELY 700 KCAL DF EXERCISE, AND DISTRIBUTED THE RIDES OVER A 24-HR PERIDD AS CDNTRASTED WITH THE 8-HR SCHEDULE OF THE PRIDR STUDY(U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-602 210
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT. (U)
DESCRIPTIVE NOTE: JOINT RESEARCH REPT.,
APR 64 16P MCLEOD,MICHAEL E. ;
CORREIA,MANNING J. ;
REPT. NO. NSAM-RR-94
CONTRACT: NASA ORDER-R-93
PROJ: MR-005-13-6001
TASK: 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, SEMICIRCULAR CANALS), (*SEMICIRCULAR CANALS, ACCELERATION TOLERANCE), EAR, EYE, TEMPERATURE, STIMULATION, GRAVITY (ARTIFICIAL), THERMISTORS, CORNEA, RETINA, WATER, VELOCITY, LYMPH (U)
IDENTIFIERS: NYSTAGMUS (U)

SIXTEEN SUBJECTS WERE GIVEN CALORIC STIMULATION WHILE LYING IN PRONE AND SUPINE BODY POSITIONS. IT WAS FOUND THAT THE NYSTAGMIC RESPONSE IN THE SUPINE POSITION WAS SIGNIFICANTLY GREATER THAN THE RESPONSE IN THE PRONE POSITION. THESE FINDINGS CANNOT BE EXPLAINED ON THE BASIS OF A CUPULA-GRAVITY INTERACTION, ASSUMING THE CUPULA IS HEAVIER THAN THE SURROUNDING ENDOLYMPH. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-602 335
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SPEED, ACCELERATION, WEIGHTLESSNESS: SOME PROBLEMS IN PHYSICS AND PHYSIOLOGY IN CONNECTION WITH ATMOSPHERIC AND SPACE FLIGHTS , (U)
JUN 64 154P ISAKOV,P. K. ;STASEVICH,R. S. ;
MONITOR: FTD ,TT MT63 103, ,64 11861

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO. SKOROSTI, USKORENIYA, NEVESOMOST' : NEKOTORYE VOPROSY FIZIKI I FIZIOLOGII PRIMENITEL'NO K POLETAM V ATMOSFERE I KOSMICHESKOM PROSTRANSTVE, MOSCOW, 1962, 150P.

DESCRIPTORS: (*SPACE FLIGHT, PHYSIOLOGY), VELOCITY, ACCELERATION, WEIGHTLESSNESS, VESTIBULAR APPARATUS, PHYSICAL FITNESS, ROCKETS, FUELS, SPACECRAFT, ASTRONAUTS, STIMULATION, REFLEXES, SPACE MEDICINE, BLOOD CIRCULATION, SHOCK (PATHOLOGY), USSR (U)

SPEED, ACCELERATION AND WEIGHTLESSNESS ARE CONSIDERED IN THE LIGHT OF NEW DATA. A SPECIAL CHAPTER IS DEVOTED TO THE QUESTION OF WEIGHTLESSNESS, IN WHICH THE PHYSICAL CONDITIONS ARISING FROM THIS PHENOMENON AND ITS INFLUENCE ON THE HUMAN ORGANISM AND ANIMALS UNDER SPACE-FLIGHT CONDITIONS ARE REPORTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-603 012
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COSMIC RESEARCH, 1964, VOL. 2, NO. 3. (U)
JUL 64 293P
MONITOR: FTD ,TT TT64 77D1 ,64 71143

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF KOSMICHESKIE ISSLEDOVANIYA (USSR) 1964, V. 2, NO. 3, P. 355-504.

DESCRIPTORS: (*SPACE FLIGHT, SCIENTIFIC RESEARCH), (*ASTROPHYSICS, SCIENTIFIC RESEARCH), SATELLITES (ARTIFICIAL), SPACE MEDICINE, SPACE PROPULSION, SPACE STATIONS, SPACECRAFT, INTEGRATION, DIFFERENTIAL EQUATIONS, MATHEMATICAL ANALYSIS, OPTICAL PROPERTIES, CLOUDS, METEOROLOGICAL SATELLITES, PERTURBATION THEORY, MAGNETIC FIELDS, INTERPLANETARY TRAJECTORIES, ORBITAL TRAJECTORIES, RADIOACTIVITY, HYPERSONIC FLOW, PRESSURE SUITS, USSR (U)

CONTENTS: INTERPLANETARY FLIGHTS WITH CONSTANT OUTPUT ENGINES, THE ACCELERATION OF A SPACECRAFT WITHIN THE RANGE OF PLANETARY INFLUENCE, ON SPACE-FLIGHT TRAJECTORIES WITH A CONSTANT REACTION ACCELERATION VECTOR, OPTIMUM TRAJECTORIES AND OPTIMUM PARAMETERS FOR SPACE VEHICLES, METHOD OF QUICKEST DESCENT AS APPLIED TO COMPUTATION OF INTERORBITAL TRAJECTORIES WITH ENGINES OF LIMITED POWER, RADIATIVE HEATING IN HYPERSONIC FLOW, OPTICAL PROPERTIES OF CLOUDS, EQUATION FOR RELEVANCE OF INFORMATION FROM WEATHER SATELLITES AND FORMULATION OF INVERSE PROBLEMS, ANALYTICAL REPRESENTATION OF THE EARTH'S MAGNETIC FIELD IN THE ORBITAL COORDINATE SYSTEM, GEOGRAPHICAL DISTRIBUTION OF RADIATION INTENSITY IN THE REGION OF THE BRAZILIAN MAGNETIC ANOMALY AT AN ALTITUDE OF ABOUT 300 KM, INVESTIGATION OF TERRESTRIAL RADIATION BELTS IN THE VICINITY OF THE BRAZILIAN MAGNETIC ANOMALY AT ALTITUDES OF 235-245 KM, THE POSSIBILITIES OF REPLACING THE NITROGEN IN THE AIR WITH HELIUM IN SPACEVEHICLE CABINS AND THE EFFECTIVENESS OF USING A HELIUM-OXYGEN MIXTURE FOR VENTILATION OF A SPACE-PRESSURE SUIT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-609 919
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA
TASK - CONTROL OF AROUSAL AND THE EFFECTS OF REPEATED UNIDIRECTIONAL ANGULAR ACCELERATION ON HUMAN VESTIBULAR RESPONSES, (U)
NOV 63 27P COLLINS,WILLIAM E. I
MONITOR: CARI , 63 29

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•ACCELERATION TOLERANCE, VESTIBULAR APPARATUS), (•VESTIBULAR APPARATUS, ACCELERATION TOLERANCE), ACCELERATION, VIBRATION, LEARNING, ADAPTATION (PHYSIOLOGY), HEARING, VISION, AUDITORY PERCEPTION, STIMULATION, SENSORY MECHANISMS, VISUAL PERCEPTION, SENSORY DEPRIVATION, MOTIVATION, AVIATION MEDICINE, DECELERATION (U)
IDENTIFIERS: NYSTAGMUS (U)

SUBJECTS WERE EXPOSED TO A 10-DAY HABITUATION SERIES OF 200 CW ACCELERATIONS IN TOTAL DARKNESS WHILE PERFORMING ATTENTION-DEMANDING TASKS. DECELERATIONS WERE SUBTHRESHOLD. PRELIMINARY AND POST-TESTS INDICATED THAT SLOW-PHASE NYSTAGMUS AND DURATION OF THE OCULAR RESPONSE DECLINED BIDIRECTIONALLY AS A FUNCTION OF THE HABITUATION TRIALS, BUT FREQUENCY OF NYSTAGMUS INCREASED DURING THE STIMULUS PERIOD AND FOR A FEW SECONDS THEREAFTER. THESE CHANGES WERE APPROXIMATELY EQUAL FOR BOTH CW AND CCW STIMULATION. MEASUREMENTS OF SUBJECTIVE VELOCITY WERE OBTAINED DURING SEVERAL PRE AND POST-TRIALS BUT NEVER DURING THE HABITUATION SERIES. A DECLINE IN THE INTENSITY OF THE SENSATION TO CW ACCELERATION, BUT NOT TO CCW STIMULATION, WAS PRODUCED BY THE HABITUATION SERIES. A SECOND POST-TEST GIVEN AFTER ONE MONTH WITH NO INTERVENING STIMULATION SHOWED LITTLE OR NO RESTORATION OF NYSTAGMUS. HOWEVER, THE SUBJECTIVE REACTION DEMONSTRATED A CLEAR, ALBEIT INCOMPLETE PATTERN OF RECOVERY. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AD-603 963
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
THE EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE. (U)
DESCRIPTIVE NOTE: REPT. FOR MAY 63-FEB 64,
JUL 64 28P TAUB,HARVEY A. I
REPT. NO. VH-1838-E-I
CONTRACT: AF33 657 11729
PROJ: 7231
TASK: 723101
MONITOR: AMRL , TDR64 7D

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•VIBRATION, VISUAL ACUITY), (•ACCELERATION TOLERANCE, VISUAL ACUITY), (•VISUAL ACUITY, VIBRATION), (•HELMENTS, ACCELERATION TOLERANCE), TOLERANCES (PHYSIOLOGY), PERFORMANCE TESTS, PERFORMANCE (HUMAN), SPACE MEDICINE, LAUNCHING, ATMOSPHERE ENTRY, STRESS (PHYSIOLOGY), SPACE ENVIRONMENTAL CONDITIONS, POSTURE, ASTRONAUTS, OSCILLATION, MANNED SPACECRAFT, MODELS (SIMULATIONS), AIR FORCE PERSONNEL, ANALYSIS OF VARIANCE (U)
IDENTIFIERS: WHOLE-BODY SINUSOIDAL VIBRATIONS (U)

FOUR EXPERIMENTS WERE PERFORMED TO DETERMINE THE EFFECTS OF WHOLE-BODY SINUSOIDAL VIBRATIONS IN THE X, Y AND Z AXES UPON DIAL READING PERFORMANCE. THE SUBJECTS WERE IN THE SEMISUPINE POSITION SO THAT THE FORCE OF GRAVITY WAS DIRECTED THROUGH THE X AXIS OF THE BODY. IN ALL FOUR EXPERIMENTS, PERFORMANCE AT 6, 11 AND 15 CPS WAS COMPARED AT VARIOUS LEVELS OF ACCELERATION AND WITH AND WITHOUT THE USE OF A HELMET RESTRAINT. FURTHER, PERFORMANCE WAS ASSESSED WITH AN EASY AND A DIFFICULT DIAL READING TASK. THE RESULTS INDICATED THAT PERFORMANCE WITH THE EASY TASK WAS RELATIVELY UNAFFECTED BY THE VIBRATION CONDITIONS WHILE LARGE AND SIGNIFICANT LOSSES IN PERFORMANCE OCCURRED WITH THE DIFFICULT TASK. MEAN ERRORS FOR THE DIFFICULT DIAL READING TASK INCREASED SIGNIFICANTLY AS ACCELERATION LEVEL OF VIBRATION INCREASED. THE RESULTS FURTHER INDICATED THAT THE EFFECTS OF HELMET RESTRAINT AND FREQUENCY UPON PERFORMANCE WITH THE DIFFICULT READING TASK VARIED WITH THE DIRECTION OF VIBRATION. THAT IS, THE USE OF A PROTECTIVE DEVICE TO RESTRICT HELMET MOVEMENTS: (A) IMPROVED PERFORMANCE AT ALL FREQUENCIES WHEN VIBRATION WAS IN THE X AXIS; (B) IMPROVED PERFORMANCE AT 6 CPS, BUT DEGRADED PERFORMANCE AT 11 AND 15 CPS IN THE Y (U)

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ODC REPORT BIBLIDGRAPHY SEARCH CONTRDL NO. ZOO529

AO-6D7 878
FOREIGN TECHNOLDGY DIV WRIGHT-PATTERSON AFB OHIO
CHANGES IN THE CDNTENT DF BIOLDGICALLY ACTIVE SUBSTANCES IN RATS UNOER THE ACTION OF RADIAL ACCELERATIONS, (U)
AUG 64 14P KHAZEN, I. M. ;VAISFEL'O,I. L. ;
MONITDR: FTD ,TT TT64 2D21 ,64 71642

UNCLASSIFIED REPORT

SUPPLEMENTARY NDTE: UNEDITED RDUGH DRAFT TRANS. OF VOPRDSY MEDITSINSKDI KHIMII (USSR) 1962, V. 8, NO. 5, P. 493-497.

DESCRIPTORS: (•ACCELERATION TOLERANCE, BIDCHEMISTRY), (•BIOCHEMISTRY, ACCELERATION TDLERANCE), (•HISTAMINE, ACCELERATION TOLERANCE), MEMBRANES (BIOLOGY), INTESTINES, LUNGS, BRAIN, TISSUES (BIOLOGY), URINE, MUCUS, PATHOLOGY, SERDTONIN, ACETYLCHOLINE, CHOLINESTERASE, CENTRAL NERVOUS SYSTEM, BLOOD ANALYSIS, MORPHOLOGY (BIOLOGY), USSR (U)

IN RATS AFTER REPEATED ACTION OF POSITIVE RADIAL ACCELERATION, THE CONTENT OF HISTAMINE INCREASES IN THE MUCOUS MEMBRANE OF THE INTESTINE, AND DECREASES CONSIDERABLY IN THE LUNGS AND TISSUES OF THE BRAIN. IN THE TISSUES INVESTIGATED, THERE IS AN INCREASE IN THE ACTIVENESS OF THE DYNAMDXYDASE, AND ALSO IN THE ADRENALIN-LIKE SUBSTANCES, ESPECIALLY IN THE LUNGS AND THE BRAIN TISSUE. AFTER A SINGLE ACTION DF NEGATIVE ACCELERATIDNS IN THE TISSUES INVESTIGATED, THERE IS A LOWERING OF THE CDNTENT OF HISTAMINE AND THE ACTIVENESS DF THE DYNAMOXYDASE, THE CDNTENT OF ADRENALIN-LIKE SUBSTANCES DECREASES IN THE MUCDUS MEMBRANE DF THE INTESTINE, AND IN THE TISSUES DF THE BRAIN, AND IN THE LUNGS ND CHANGE IS NDTED. AFTER MULTIPLE AND DFTEN REPEATED ACTIDN DF POSITIVE ACCELERATIDNS IN THE INVESTIGATED TISSUE, THERE IS ALSO A LOWERING OF THE HISTAMINE AND CDNTENT DF ADRENALIN-LIKE SUBSTANCES IN THE MUCOUS MEMBRANE OF THE INTESTINE AND IN THE TISSUES DF THE BRAIN. UNDER DIFFERENT CONDITIONS OF THE EXPERIMENT THERE IS A REDUCTION IN THE EXCRETION OF 5-OXYINDDLUXUS ACID WITH THE URINE, WHEREBY, THE CHANGE IN THE EXCRETIDN OF ACID ALSO OCCURS WITH A DEFINITE DEPENDENCE ON THE MAGNITUDE, THE FREQUENCY AND DURATION DF THE ACTION. (AUTHOR) (U)

DDC REPORT BIBLIDGRAPHY SEARCH CONTRDL NO. Z00529

AD-608 570
NAVAL SCHODL DF AVIATION MEDICINE PENSACDLA FLA
THE EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT DN NYSTAGMUS GENERATED BY ANGULAR ACCELERATION. (U)
DESCRIPTIVE NOTE: REPT. NO. 99,
SEP 64 44P LANSBERG,MARTIN P. ;
GUEDRY,FRED E. ,JR.;GRAYBIEL,ASHTON ;
PROJ: MR005 13 6001 ,NASA ORDER NO. R93
TASK: 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-608 571.

DESCRIPTORS: (*ACCELERATION TOLERANCE, SEMICIRCULAR CANALS), (*SEMICIRCULAR CANALS, ACCELERATIDN TOLERANCE), DECELERATIDN, ROTATION, STIMULATIDN, EYE, RECORDING SYSTEMS, SPACE MEDICINE (U)
IDENTIFIERS: NYSTAGMUS, OTDLITH SYSTEM (U)

THE EFFECT DF CENTRIPETAL ACCELERATION ON NYSTAGMUS WAS STUDIED BY PLACING MEN AT RADII OF 17 AND 20 FEET IN VARIOUS ORIENTATIONS RELATIVE TO THE CENTER OF ROTATIDN. ANGULAR ACCELERATIDNS AND DECELERATIONS WERE APPROXIMATELY 10 DEG/SEC SQUARED. IN SDME OF THESE DIFFERENT POSITIONS, THE PLANES OF THE SEMICIRCULAR CANALS REMAINED UNCHANGED RELATIVE TO THE PLANE OF ROTATIDN, BUT THE ORIENTATION DF THE RESULTANT FORCE RELATIVE TO THE DTOLITH SYSTEM WAS CHANGED. IN SEVERAL SUCH SITUATIONS THE MAGNITUDE, PLANE, AND DIRECTION OF NYSTAGMUS WERE CHANGED BY CENTRIPETAL ACCELERATIDNS BETWEEN 1 AND 2 G-UNITS. RESULTS ARE DISCUSSED IN TERMS DF OTOLITH MODULATION DF SENSORY INPUT FROM THE SEMICIRCULAR CANALS. (AUTHDR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-608 571
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
INFLUENCE OF LABYRINTH ORIENTATION RELATIVE TO GRAVITY ON RESPONSES ELICITED BY STIMULATION OF THE HORIZONTAL SEMICIRCULAR CANALS. (U)
DESCRIPTIVE NOTE: REPT. NO. 100,
SEP 64 10P CORREIA,MANNING J. ;
GUEDRY,FRED E. ,JR.;
PROJ: MR005 13 6001 NASA ,ORDER R93
TASK: 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO: AD-608 570.

DESCRIPTORS: (*ACCELERATION TOLERANCE, SEMICIRCULAR CANALS), (*SEMICIRCULAR CANALS, ACCELERATION TOLERANCE), DECELERATION, ROTATION, STIMULATION, EYE, SPACE MEDICINE (U)
IDENTIFIERS: NYSTAGMUS, OTOLITH SYSTEM (U)

TWO EXPERIMENTS WERE CONDUCTED TO EXAMINE THE EFFECTS OF DIFFERENT ORIENTATIONS OF THE HORIZONTAL SEMICIRCULAR CANAL CUPULAE RELATIVE TO GRAVITY ON NYSTAGMIC OUTPUT FOLLOWING DECELERATION FROM ROTATION ABOUT THE EARTH-HORIZONTAL AXIS. DIFFERENCES IN NYSTAGMUS OUTPUT WITH DIFFERENT STOPPING POSITIONS WERE NOT ENTIRELY CONSISTENT WITH PREDICTIONS BASED ON THE ASSUMPTION THAT CUPULA DEFLECTION WAS INFLUENCED BY GRAVITY. A MORE PLAUSIBLE EXPLANATION, MODULATION OF CANAL-INITIATED RESPONSES BY OTOLITH ACTIVITY, WAS PRESENTED. A HIGH INCIDENCE OF MOTION SICKNESS WAS ENCOUNTERED WHILE ROTATING SUBJECTS ABOUT THE ERTH-HORIZONTAL AXIS AND IT WAS APPARENTLY CONTROLLED BY THE MENTAL TASK ASSIGNED TO THE SUBJECT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00329

AD-610 132
BROWN ENGINEERING CO INC HUNTSVILLE ALA
PHYSIO-MECHANICAL EFFECTS OF ACCELERATIONS ON HUMAN BEINGS WORKING IN A ROTATING ENVIRONMENT. (U)
DESCRIPTIVE NOTE: TECHNICAL NOTE,
NOV 64 38P CREWS,HARRY C. ,JR.;
REPT. NO. BROWNENG-R-63

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, ADAPTATION (PHYSIOLOGY)), (*ROTATION, ADAPTATION (PHYSIOLOGY)), STRESS (PHYSIOLOGY), REACTION (PSYCHOLOGY), CONFINED ENVIRONMENTS, PERFORMANCE (HUMAN), THRESHOLDS (PHYSIOLOGY), VESTIBULAR APPARATUS, SEMICIRCULAR CANALS, PATHOLOGY, MATHEMATICAL ANALYSIS, MAINTENANCE PERSONNEL, RADAR EQUIPMENT (U)
IDENTIFIERS: PHYSIO-MECHANICAL EFFECTS (U)

THE MECHANICAL FORCES ACTING UPON PERSONNEL AND EQUIPMENT IN A ROTATING ENVIRONMENT ARE DESCRIBED. THESE FORCES ARE USED TO EXPLAIN THE OBSERVED PHYSIOLOGICAL AND PSYCHOLOGICAL REACTIONS OF PERSONNEL. PROCEDURES AND PRACTICES ARE RECOMMENDED TO HOLD ADVERSE REACTIONS TO AN ACCEPTABLE MINIMUM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-611 946
TECHNOLOGY INC DAYTON OHIO
MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR JUL 62-MAY 64,
64 10P WEIS,EDMUND B. ,JR.;
CLARKE,NEVILLE P. ;BRINKLEY,JAMES W.;
MARTIN,PAUL J. ;
CONTRACT: AF33 657 10010
PROJ: 7231
TASK: 723101
MONITOR: AMRL , TR-65-7

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AEROSPACE MEDICINE (U. S.) V35 N10 P949-50 OCT 1964 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS). PRESENTED AT THE AEROSPACE MEDICAL ASSOCIATION MEETING IN MIAMI, FLORIDA, MAY 12, 1964.

DESCRIPTORS: (*HUMAN ENGINEERING, ACCELERATION TOLERANCE), (*ACCELERATION TOLERANCE, HUMAN ENGINEERING), (*AEROSPACE CRAFT, HUMAN ENGINEERING), AVIATION MEDICINE, SPACE MEDICINE, HUMANS, BIOPHYSICS, MATHEMATICAL MODELS (U)
IDENTIFIERS: MECHANICAL IMPEDANCE (U)

THE PROBLEM OF DEVELOPING QUANTITATIVE STANDARDS AND DESIGN LIMITS FOR HUMAN EXPOSURES TO DYNAMIC ACCELERATION IS DISCUSSED. THE CONCEPT OF THE DEVELOPMENT OF A MECHANICAL IMPEDANCE MODEL OF THE HUMAN TO QUANTITATE ENERGY TRANSFER FROM THE ENVIRONMENT TO THE HUMAN IS REVIEWED. THE METHODS OF MEASUREMENT AND CALCULATION OF IMPEDANCE AS WELL AS SOME CURRENT RESULTS ARE DISCUSSED. THE UTILIZATION OF THE IMPEDANCE RESULTS IN THE PROCESS OF PROTECTION SYSTEM DEVELOPMENT IS PRESENTED AS A CRITERION FOR PERFORMANCE. THE MEANING OF THE IMPEDANCE RESULTS AND THEIR CORRELATION WITH TOLERANCE EXPERIMENTATION IS DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-612 957
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
A RESTRAINT SYSTEM FOR APPLICATION IN RSUBZ AND - GSUBX ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR DEC 63-FEB 64,
DEC 64 15P VAN PATTEN,ROBERT E. ;
REPT. NO. AMRL-TR-64-144
PROJ: 7222

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, SAFETY HARNESS), (*SAFETY HARNESS, ACCELERATION TOLERANCE), ASTRONAUTS, SAFETY DEVICES, GRAVITY (ARTIFICIAL), LEG, HEAD, BODY, YAW, DESIGN, HUMAN ENGINEERING (U)

THIS REPORT DESCRIBES THE DEVELOPMENT OF A LOWER LEG RESTRAINT SYSTEM DESIGN SUITABLE FOR USE IN YAW (R SUB Z) AND TRANSVERSE P-A G (-G SUB X) ACCELERATION ENVIRONMENTS. THE DESIGN IS BASED UPON THE PRINCIPLE OF AVOIDING RESTRAINING FORCE CONCENTRATIONS ALONG THE ANTERIOR CREST OF THE TIBIA AND HAS BEEN WORN WITH COMFORT FOR PERIODS OF UP TO THREE MINUTES WITH THE LEGS IN A 9.8 G FIELD. (AUTHOR) (U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-613 331
MAYO CLINIC ROCHESTER MINN
BLOOD OXYGEN CHANGES INOUCED BY FORWARD (+GX) ACCELERATION. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR 1 APR 62-1 NOV 64,
OEC 64 25P BANCHERO,NATALIO ;
CRONIN,LUCILLE ;NOLAN,A. CLARK ;WOOD,EARL H.
;
CONTRACT: AF 33(657)-8899, NIH-H3532
PROJ: 7222
MONITOR: AMRL , TR-64-132

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF OOC. COPY IS AVAILABLE FOR PUBLIC SALE. PREPARED IN COOPERATION WITH MAYO GRADUATE SCHOOL OF MEDICINE, ROCHESTER, MINN.

DESCRIPTORS: (+ACCELERATION TOLERANCE, BLOOD ANALYSIS), (+THORAX, ACCELERATION TOLERANCE), OXYGEN CONSUMPTION, RESPIRATION, BLOOD VOLUME, ARTERIES, VEINS, LUNGS, GRAVITY, ANESTHESIA, DOGS (U)

SIX DOGS UNDER MORPHINE-PENTOBARBITAL ANESTHESIA WERE EXPOSED TO FORWARD ACCELERATIONS OF 2, 4 AND 6G FOR ONE MINUTE AND 6G FOR THREE MINUTES WHILE IN THE HORIZONTAL, 15 DEGREES HEAD-UP AND 15 DEGREES HEAD-DOWN POSITIONS BREATHING ROOM AIR. EXPOSURES TO 6G WERE REPEATED BREATHING 99.6% OXYGEN. OXYGEN SATURATION AND OPACITY AT 800 MILLIMICRONS OF BLOOD WERE RECORDED CONTINUOUSLY BY CUVETTE OXIMETERS. PULMONARY ARTERIAL-VENOUS SHUNTING WAS ESTIMATED FROM BLOOD OXYGEN SATURATIONS. NO SYSTEMATIC CHANGES IN FEMORAL ARTERY OXYGEN SATURATION OCCURRED AT 2G WHILE A SMALL AVERAGE DECREASE WAS OBSERVED AT 4G (4%). DECREASES OCCURRED AT 6G AVERAGING 11 (5-17) PER CENT AT THE END OF THE 60-SECOND EXPOSURE. RETURN TO CONTROL (1G) VALUES WAS NEARLY COMPLETE 30 SECONDS AFTER THE EXPOSURE. OXYGEN INHALATION DELAYED BUT DID NOT PREVENT THE DESATURATION. THESE DECREASES ARE BELIEVED DUE TO PULMONARY ARTERIAL-VENOUS SHUNTING. THE AVERAGE INCREASE IN PULMONARY ARTERIALVENOUS SHUNT OVER 1G VALUES ESTIMATED AT THE END OF 60SECOND EXPOSURES TO 6G WHEN BREATHING AIR, WAS 17 (11-21) PER CENT. VALUES FOR SHUNTS AT 6G, WHEN BREATHING OXYGEN, WERE SIMILAR. (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-613 541
MAYO CLINIC ROCHESTER MINN
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR 15 JUL 63-1 NOV 64, DEC 64 31P RUTISHAUSER,WILHELM J. ; BANCHERO,NATALIO ;TSAKIRIS,ANASTASIO G. ; STURM,RALPH E. ;WOOD,EARL H. ;
CONTRACT: AF33 657 8899
PROJ: 7222
MONITOR: AMRL , TR-64-133

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, THORAX), (*THORAX, ACCELERATION TOLERANCES), PRESSURE, POSTURE, CANNULATION, RECORDING SYSTEMS, RESPIRATION, HEART, LUNGS, WEIGHT, DOGS, MEASUREMENT (U)

INTRAPLEURAL PRESSURES WERE MEASURED SIMULTANEOUSLY BY SALINE-FILLED CATHETERS FROM 2 TO 5 DIFFERENT SITES IN THE POTENTIAL RIGHT PLEURAL SPACE OF NINE ANESTHETIZED DOGS WHILE THE ANIMALS WERE SUPPORTED IN THE SUPINE AND PRONE POSITIONS BY MEANS OF MOLDED HALF-BODY CASTS. INTRAPLEURAL TIPS OF THE CATHETERS WERE PLACED AT HEART LEVEL IN THE CEPHALAD-CAUDAD DIMENSION AT VENTRAL (RETROSTERNAL) AND DORSAL (PARAVERTEBRAL) SITES IN THE THORAX. THE SITE OF EACH CATHETER TIP WAS MEASURED FROM BIPLANE X-RAYS TAKEN IN EACH POSITION. THE AVERAGE VERTICAL DISTANCE BETWEEN THE DORSAL AND VENTRAL CATHETER TIPS WAS 10.6 (S.E. OF MEAN = ±0.2) CM. IN THE SUPINE POSITION, MEAN END-EXPIRATORY PRESSURE AT THE SUPERIOR (VENTRAL) CATHETER TIP WAS -11.9 (±0.7) CM. H2O AS COMPARED TO -5.0 (±0.5) CM. H2O AT THE DEPENDENT (DORSAL) SITE GIVING AN AVERAGE GRADIENT OF 0.64 (± 0.04)CM. H2O/CM. VERTICAL DISTANCE BETWEEN THE TWO RECORDING SITES. THE RESPECTIVE VALUES IN THE PRONE POSITION WERE: -9.0 (±0.6) CM. H2O SUPERIOR (DORSAL) SITE; +0.7 (±0.5) CM. H2O DEPENDENT (VENTRAL) SITE; GRADIENT: 0.91 (±0.05) CM. H2O/CM. VERTICAL DISTANCE. THE SLIGHTLY POSITIVE VALUE FOR RETROSTERNAL PLEURAL PRESSURE AND THE GREATER DORSAL-VENTRAL GRADIENT, WHEN IN THE PRONE POSITION, MAY BE DUE TO THE WEIGHT OF THE HEART. DURING THE INCREASE IN WEIGHT INDUCED BY ACCELERATION, THESE PRESSURES WERE MULTIPLIED ROUGHLY IN PROPORTION TO THE G LEVEL AND (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AO-615 374
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
TOLERANCE TO TRANSVERSE (+GX) AND HEADWARD (+GZ) ACCELERATION AFTER PROLONGED BED REST. (U)
63 4P MILLER,PERRY B. ;
LEVERETT,SIDNEY D. ,JR.;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AEROSPACE MEDICINE V36 N1 P13-9 JAN 1965 (COPIES NOT AVAILABLE TO DOC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (+ACCELERATION TOLERANCE, ASTRONAUTS), (+RELAXATION (PHYSIOLOGY), ACCELERATION TOLERANCE), REFLEXES, HEART, PULSE RATE, VISION, PATHOLOGY, ELECTROCARDIOGRAPHY, SPACE MEDICINE, SPACE FLIGHT, ATMOSPHERE ENTRY, SIMULATION (U)
IDENTIFIERS: BED REST (U)

TOLERANCE TO THE TRANSVERSE (+GX) ACCELERATION OF A SIMULATED GEMINI RE-ENTRY PROFILE WAS DETERMINED BEFORE AND AFTER 4 WEEKS OF ABSOLUTE BED REST. TOLERANCE TO HEADWARD (+GZ) ACCELERATION WAS STUDIED BEFORE AND AFTER 4 WEEKS OF ABSOLUTE BED REST AND 2 WEEKS OF MODIFIED BED REST. AS JUDGED BY THE DEGREE OF PHYSICAL DISCOMFORT, THE ABILITY TO RESPOND TO A CENTRAL LIGHT, OR THE PRESENCE OF ELECTROCARDIOGRAPHIC ABNORMALITIES, TOLERANCE TO + GX WAS UNAFFECTED BY 4 WEEKS OF ABSOLUTE BED REST. IN EACH SUBJECT STUDIED, HEART RATES DURING PEAK ACCELERATION WERE HIGHER AFTER BED REST THAN BEFORE. AS JUDGED BY THE LEVEL OF ACCELERATION AT WHICH CENTRAL VISION WAS LOST, NO SIGNIFICANT CHANGE IN TOLERANCE TO HEADWARD (+GZ) ACCELERATION OF RAPID ONSET WAS OBSERVED AFTER 2 WEEKS OF MODIFIED BED REST OR AFTER 4 WEEKS OF ABSOLUTE BED REST. AFTER EACH TYPE OF BED REST, THE MAJORITY OF THE SUBJECTS HAD DECREASED TOLERANCE TO HEADWARD (+GZ) ACCELERATION OF GRADUAL ONSET, BUT THE MEAN DECREASE WAS NOT STATISTICALLY SIGNIFICANT. MEAN HEART RATES AT EQUIVALENT LEVELS OF +GZ WERE SIGNIFICANTLY HIGHER AFTER BOTH PERIODS OF BED RESTS. THE ONLY ARRHYTHMIA OF CLINICAL IMPORTANCE NOTED WAS THE APPEARANCE OF BURSTS OF PREMATURE ATRIAL CONTRACTIONS DURING G.D.R. + GZ IN 1 SUBJECT AFTER 2 WEEKS OF BED REST. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-615 570
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
A SUMMARY OF HUMAN TOLERANCE TO PROLONGED ACCELERATION. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR JAN 63-JAN 65, FEB 65 42P HYDE,ALVIN S. ;RAAB,HAROLD W. ;
REPT. NO. AMRL TR-65-36
PROJ: 7222

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, HUMANS), DATA, TABLES, GRAPHICS, STRESS (PHYSIOLOGY), COUNTERMEASURES, TIME (U)

HUMAN SUBJECT TOLERANCE TO ACCELERATIONS OF GREATER THAN ONE SECOND DURATION IS SUMMARIZED FOR THE ORTHOGONAL X, Y, AND Z AXES. BECAUSE EACH INVESTIGATOR AT EACH LABORATORY UTILIZES DIFFERENT RESTRAINT SYSTEMS, BODY POSITIONS, AMBIENT TEMPERATURES, ETC. AND MOST IMPORTANT, UTILIZES DIFFERENT CRITERIA OF 'TOLERANCE,' THE DATA ARE REFERENCED AND PRESENTED IN TABLES AND GRAPHS FOR EACH MAJOR CATEGORY (DIRECTION) OF ACCELERATION. THE POINTS PRESENTED IN THE GRAPHS AND TABLES ARE USUALLY THE HIGHEST VALUES ACHIEVED; IN EACH SERIES THERE WERE SUBJECTS WHO COULD NOT TOLERATE THE GIVEN DIRECTION, AMPLITUDE, AND DURATION. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-617 011
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
MAN'S SHORT-TIME TOLERANCE TO SINUSOIDAL VIBRATION. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR JAN 61-JAN 64,
65 10P TEMPLE,WILLIAM E. ;
CLARKE,NEVILLE P. ;BRINKLEY,JAMES W. ;
MANOEL,MORRIS J. ;
REPT. NO. TR-65-96
PROJ: 7231
TASK: 723101

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AEROSPACE MEDICINE V35 N10 P923-30 OCT 1964. (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*ACCELERATION TOLERANCE, ASTRONAUTS), (*TOLERANCES(PHYSIOLOGY), VIBRATION), SAFETY HARNESS, MANNED SPACECRAFT, STRESS(PHYSIOLOGY), EXPOSURE, SPACE MEDICINE, TABLES (U)

MAN'S VOLUNTARY, SUBJECTIVE, SHORT-TIME TOLERANCE LIMITS TO SINUSOIDAL VIBRATIONS AT FREQUENCIES BETWEEN 2 AND 20 CPS IN THE THREE ORTHOGONAL AXES HAVE BEEN DETERMINED. THE GENERAL SHAPE OF A SERIES OF CURVES DEPICTING TOLERABLE LEVELS OF VIBRATION ACCELERATION AS A FUNCTION OF FREQUENCY HAS BEEN DEFINED. TWO DIFFERENT SUPPORT AND RESTRAINT SYSTEMS HAVE BEEN EMPLOYED AND THE INFLUENCE OF THE SYSTEM USED ON THE TOLERANCE LIMITS REACHED HAS BEEN DISCUSSED. REASONS FOR THE OBSERVED DIFFERENCES HAVE BEEN ANALYZED. IT HAS BEEN FOUND THAT THE MAGNITUDE OF ACCELERATION TOLERATED AT EACH FREQUENCY AND, TO SOME EXTENT, THE TYPE OF SYMPTOM ARE INFLUENCED BY BOTH THE EXPERIMENTAL DESIGN AND THE SUPPORT AND RESTRAINT SYSTEM USED. FURTHERMORE, THE TYPE OF SYMPTOM OCCURRING APPEARS TO BE SOMEWHAT DEPENDENT UPON THE ACCELERATION LEVEL REACHED. EMPHASIS IS GIVEN TO THE FACT THAT, FOR MANNED SPACE VEHICLES, HIGH AMPLITUDES OF VIBRATION IN THE 1 TO 20 CPS FREQUENCY RANGE ARE TO BE AVOIDED IF POSSIBLE. IF THIS IS NOT POSSIBLE, THE RESULTS SUGGEST THAT FUTURE DESIGN CONSIDERATIONS INCLUDE PROVISION FOR CLOSE COUPLING OF BODY AND HEAD (WITH HELMET AND LINEAR) TO THE SUPPORT SYSTEM TO IMPROVE TOLERANCE TO THE FREQUENCIES BELOW 10 CPS. BETWEEN 10 AND 20 CPS, METHODS OF ISOLATING THE BODY AND PARTICULARLY THE HEAD FROM VIBRATION INPUT OF HIGH (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-617 792
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
CHANGES IN SPONTANEOUS ACTIVITY AS A MEASURE OF SENSITIVITY TO ROTATION IN THE WHITE RAT, (U)
JAN 65 13P ESKIN,ARNOLO ;RICCIO,DAVID C. ;
REPT. NO. NSAM-913
PROJ: MROO5 13 6001
TASK: 1
MONITOR: NAVMEO , MROO5.13-6001.1-103

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: JOINT REPT. WITH NATIONAL AERONAUTICS AND SPACE AOMINISTRATION, WASHINGTON, O. C.

OESCRIPTORS: (*ROTATION, SENSITIVITY), (*ACCELERATION TOLERANCE, RATS), BEHAVIOR, MOTION, VESTIBULAR APPARATUS, STIMULATION, PSYCHOPHYSIOLOGY, AVIATION MEDICINE, STRESS(PHYSIOLOGY) (U)

FIFTY-SIX UNRESTRAINEO RATS WERE INOIVIOUALLY EXPOSED TO A ROTATION SPEEO BETWEEN O-18 RPM. THEIR ACTIVITY WAS MEASUREO USING A FOURPOINT SCALE: (O) NO ACTIVITY, (I) GROOMING AND SNIFFING, (2) MOOERATE RUNNING, AND (3) RAPID RUNNING. AMOUNT OF ACTIVITY OECREASEO AS A FUNCTION OF ROTATION SPEEO FROM 6 TO 14 RPM, WHERE IT REACHEO A LOWER LIMIT PLATEAU. RATE OF OECLINE WITHIN THIS SPEEO RANGE WAS ALSO OIRECTLY RELATED TO VELOCITY. POSTROTATION ACTIVITY WAS SUPPRESSED UP TO FIVE MINUTES. THE RATS SHOWEO CONSIDERABLE SENSITIVITY TO CORIOLIS STIMULI GENERATED OURING CONSTANT SPEEO OF ROTATION. A RELATIONSHIP WAS FOUNO BETWEEN OURATION ANO MAGNITUOE OF STIMULATION. THESE FINOINGS ARE ENCOURAGING FOR THE USE OF BEHAVIORAL METHOOS IN STUOYING SENSITIVITY TO MOTION. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-618 280
FROST ENGINEERING DEVELOPMENT CORP DENVER COLO
A REVIEW OF RESTRAINT SYSTEMS TEST METHODS. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR OCT 62-AUG 63,
SEP 63 12P STECH,ERNEST L. ;
CONTRACT: AF33 657 9514
PROJ: 6301
TASK: 630102
MONITOR: AMRL , TR-65-109

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AMERICAN SOCIETY OF MECHANICAL ENGINEERS, JOURNAL AS PAPER NUMBER 63-WA-279 P1-9 1963(COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS). PREPARED FOR PRESENTATION AT THE WINTER ANNUAL MEETING, PHILADELPHIA, PA., NOVEMBER 17-22, 1963, OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

DESCRIPTORS: (*ACCELERATION TOLERANCE, SAFETY HARNESS), (*SAFETY HARNESS, ACCELERATION TOLERANCE), REVIEWS, STRESS(PHYSIOLOGY), ANTHROPOMETRY, DAMPING, VIBRATION, FREQUENCY, RESONANCE, ACCELEROMETERS, MATHEMATICAL MODELS, ANATOMICAL MODELS, TOLERANCES(PHYSIOLOGY), MECHANICAL PROPERTIES, TEST METHODS, ANIMALS, HUMANS (U)

RESTRAINT TEST METHODS ARE REVIEWED WITH REFERENCE TO A MATHEMATICAL MODEL OF THE DYNAMICS OF THE HUMAN BODY. THIS APPROACH IS SUGGESTED SO THAT THE MECHANICAL CHARACTERISTICS OF RESTRAINT SYSTEMS CAN BE EVALUATED IN TERMS OF THEIR INFLUENCE ON THE DYNAMIC RESPONSE OF THE HUMAN BODY IN ANY ACCELERATION ENVIRONMENT. ANTHROPOMORPHIC DUMMIES, ANIMALS, LIVE HUMANS AND HUMAN CADAVERS ARE DISCUSSED WITH RESPECT TO THEIR ADVANTAGES AND DISADVANTAGES IN RESTRAINT SYSTEM TESTS. THE CONCEPTS OF INJURY RISK, SUBJECT VARIABILITY, AND DYNAMIC AND ANATOMICAL DIFFERENCES BETWEEN ANIMAL AND HUMAN SUBJECTS ARE CONSIDERED. THE AVAILABLE METHODS FOR RESTRAINT TESTS ARE DISCUSSED IN TERMS OF THE AMOUNT AND KIND OF INFORMATION GENERATED AND A TEST TECHNIQUE IS RECOMMENDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-618 416
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
EXPERIMENTAL DETERMINATION OF HUMAN VESTIBULAR SYSTEM RESPONSE THROUGH MEASUREMENT OF EYEBALL COUNTERROLL. (U)
DESCRIPTIVE NOTE: MASTER'S THESIS,
65 10P HARTZLER,VICTOR L. ;
ROCCAFORTE,PHILIP A. ;
REPT. NO. GE/EE/65-11

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, VESTIBULAR APPARATUS), (*VESTIBULAR APPARATUS, ACCELERATION TOLERANCE), EYE, MOTION, ROTATION, VISION, PERFORMANCE(HUMAN), STRESS(PHYSIOLOGY), SEMICIRCULAR CANALS, MATHEMATICAL MODELS, FOURIER ANALYSIS, GRAPHICS, TABLES (U)
IDENTIFIERS: EYE COUNTERROLLING, NYSTAGMUS (U)

AN INDIRECT MEASUREMENT OF THE HUMAN VESTIBULAR SYSTEM RESPONSE WAS OBTAINED THROUGH THE MEASUREMENT OF EYEBALL COUNTERROLL. HUMAN SUBJECTS WERE ROTATED ABOUT AN AXIS THROUGH THEIR LINE OF SIGHT AT ANGULAR VELOCITIES VARYING FROM 0-30 RPM. THE RIGHT EYE WAS PHOTOGRAPHED AND THE ANGLE OF EYEBALL COUNTERROLL WAS DETERMINED BY AN OPTICAL CORRELATION PROCESS. A MATHEMATICAL MODEL WAS FORMULATED USING FOURIER CURVE FITTING TECHNIQUES. THIS MODEL INDICATED THAT SUBJECTS WITH NORMAL VESTIBULAR FUNCTION DEMONSTRATE AN EYEBALL COUNTERROLL WHICH IS A FUNCTION OF ANGULAR VELOCITY AND POSITION WITH RESPECT TO THE VERTICAL. SUBJECTS WITH KNOWN VESTIBULAR DEFECTS DEMONSTRATED A SMALL COUNTERROLL. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-620 273
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
THE EFFECT OF HIGH ACCELERATION FORCES UPON CERTAIN PHYSIOLOGICAL FACTORS OF HUMAN SUBJECTS PLACED IN A MODIFIED SUPINE POSITION: SDC PROJECT 9-U-37A: POSITION 3, (U)
OCT 49 28P STAUFFER,FLOYD R. ;
PROJ: NM001 010
MONITOR: NAVMED , NM-001-010-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, POSTURE), STRESS(PHYSIOLOGY), RESPIRATION, PAIN, CARDIOVASCULAR SYSTEM, AVIATION MEDICINE (U)

SIX MALE SUBJECTS WERE EXPOSED TO ACCELERATION FORCES UP TO 12 G RESULTANT FOR 5-8 SECONDS ON THE HUMAN CENTRIFUGE. DURING THESE EXPOSURES THEY WERE IN A MODIFIED SUPINATED POSITION IN WHICH THE BENT KNEES PLACED THE FEET AT A LEVEL SOMEWHAT BELOW THAT OF THE REST OF THE BODY. DURING ROTATION OF THE CENTRIFUGE THE SEAT PIVOTED SO THAT THE RESULTANT G FORCE WAS SUPPLIED TO THE SUBJECT IN A DIRECTION FROM CHEST TO BACK. CONSCIOUSNESS, VISION, AND VOLUNTARY FINGER MOVEMENTS AT THE HIGHEST G OBTAINABLE ON THIS CENTRIFUGE WERE NOT IMPAIRED UNDER THESE CONDITIONS. HUMAN TOLERANCE TO G FORCE UNDER THESE CONDITIONS SEEMED TO BE RESTRICTED BY RESPIRATION AND PAIN. EAR OPACITY AND EAR PULSE WERE RELATIVELY POOR INDICATORS OF THE CARDIOVASCULAR CHANGES TAKING PLACE UNDER THESE CONDITIONS. THE CARDIOVASCULAR SYSTEM, ACCORDING TO THE HEART RATE AND ELECTROCARDIOGRAM, DID NOT SHOW SEVERE ENOUGH CHANGES TO CONSIDER IT AS ONE OF THE IMPORTANT FACTORS OF HUMAN TOLERANCE TO G FORCE UNDER THESE CONDITIONS. THE PRACITCALITY OF THIS POSITION FOR AIRCRAFT PERSONNEL WERE DISCUSSED. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-620 298
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FLA
HIGH ACCELERATIONS IN INTERMEDIATE TRAINING: INCIDENCE OF SYMPTOMS AND AN ESTIMATE OF TOLERANCE TO 'G'. (U)
DEC 45 7P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, BLACKOUT(PHYSIOLOGY)), (*BLACKOUT(PHYSIOLOGY), AVIATION PERSONNEL), STRESS(PHYSIOLOGY), GRAVITY, INSTRUCTORS, STUDENTS, TRAINING, DIVE BOMBING, GUNNERY TRAINERS, AVIATION MEDICINE (U)

THE INCIDENCE OF OBVIOUS SYMPTOMS DUE TO HIGH ACCELERATIONS IN INSTRUCTORS AND STUDENTS WAS ESTIMATED BY MEANS OF A QUESTIONNAIRE. ROUGHLY ONE-HALF HAD EXPERIENCED GREYOUT OR BLACK-OUT, AND ONE-EIGHTH BLACKED OUT FREQUENTLY. IN A PRIMARY SQUADRON THERE WAS LESS BLACK-OUT EXPERIENCED BY STUDENTS THAN AT A SQUADRON TRAINING IN DIVE BOMBING AND GUNNERY, WHERE ONE-QUARTER BLACKED OUT FREQUENTLY. FIFTEEN OF 16 PRIMARY INSTRUCTORS ADMITTED BLACKING OUT, ALMOST ONE HALF FREQUENTLY. FROM WHAT IS KNOWN OF THE G'S PRODUCED BY THE MANEUVERS RESPONSIBLE FOR BLACK-OUT, THE TOLERANCE FOR G OF ALL OF THESE INDIVIDUALS WAS LESS THAN + 6 G, AND MOST OF THEM CERTAINLY LESS THAN + 5 G, APPLIED FOR NOT MORE THAN 4 SECONDS. THERE WAS CONSIDERABLE IGNORANCE SHOWN AS TO THE CAUSES OF BLACK-OUT AND METHODS OF ITS PREVENTION. ABOUT HALF THE SUBJECTS DID NOT KNOWN HOW THEIR TOLERANCE TO G COULD BE ALTERED. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZODS29

AD-620 319
TECHNOLOGY INC DAYTON OHIO APPLIED SCIENCES DIV
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE. (U)
DESCRIPTIVE NOTE: FINAL REPT. FOR JUN-SEP 64,
APR 65 37P PRIMIANO,FRANK P. ,JR.;
LOWRY,RICHARD D. ;CLARKE,NEVILLE P. ;
CONTRACT: AF33 615 1894
PROJ: 7231
TASK: 723101
MONITOR: AMRL , TR-65-27

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VIBRATORS(MECHANICAL), FLIGHT SIMULATORS), (*FLIGHT SIMULATORS, VIBRATORS(MECHANICAL)), (*STRESS(PHYSIOLOGY), FLIGHT SIMULATORS), AVIATION MEDICINE, SPACE MEDICINE, ACCELERATION TOLERANCE, TEST EQUIPMENT, VIBRATION, EXTREMELY LOW FREQUENCY, WAVE ANALYZERS, HUMAN ENGINEERING (U)

THE ACCELERATION ENVIRONMENT PRODUCED BY THE WESTERN GEAR MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE WAS SURVEYED AT EVEN FUNDAMENTAL FREQUENCIES FROM 2 TO 20 CPS AT TWO LEVELS OF ACCELERATION, 1 G AND 2 G. THE FREQUENCY COMPONENTS OF THE MOTION UP TO 50 CPS WERE DETERMINED BY A H-H 9050 AUTOMATIC WAVE ANALYZER AND ARE PRESENTED IN THE FORM OF HARMONIC DISTRIBUTIONS FOR EACH FUNDAMENTAL. THE 'TOTAL DISTORTION FIGURE' AND 'OVERALL DISTORTION FIGURE' ARE USED AS MEASURES OF THE FIDELITY WITH WHICH THE ACCELERATION WAVE APPROXIMATES A PURE SINE WAVE OF THE FUNDAMENTAL FREQUENCY. THE DATA DICTATED THAT THE 1 G ACCELERATION WAS MORE DISTORTED THAN THE 2 G AND THAT AT BOTH LEVELS THE DISTORTION INCREASED WITH FREQUENCY. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-622 026
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT. (U)
DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. FOR JAN-APR 64,
AUG 65 15P HENZEL,JOHN H. ;
CLARKE,NEVILLE P. ;MOHR,GEORGE C. ;
WEIS,EDUND B. ,JR.;
REPT. NO. AMRL-TR-65-134
PROJ: 7231
TASK: 723106

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*EJECTION, FRACTURES(BONE)), (*FRACTURES(BONE), SPINAL COLUMN), (*SPINAL COLUMN, ACCELERATION TOLERANCE), THORAX, ACCELERATION, EJECTION SEATS, IMPACT SHOCK, TOLERANCES(PHYSIOLOGY), WOUNDS + INJURIES, SPACE MEDICINE, STRESS(PHYSIOLOGY) (U)

THE OCCURRENCE OF COMPRESSION DEFORMITIES OF THE FOURTH AND FIFTH THORACIC VERTEBRAE IN A HUMAN TEST SUBJECT (OCL) EXPOSED IN LABORATORY EXPERIMENTS TO AN IMPACT ACCELERATION PROFILE SIMILAR TO THAT PRODUCED BY EJECTION SEAT ROCKETS IS REPORTED. THIS INJURY WAS PRESUMED TO BE THE RESULT OF AN IMPACT PROFILE HAVING A PEAK ACCELERATION OF 18.8G, A RATE OF ONSET OF 420G PER SECOND AND A BASELINE DURATION OF APPROXIMATELY 100 MILLISECONDS. THE SUBJECT'S LONG AXIS WAS INCLINED BACKWARD 34 DEGREES FROM THE VERTICAL FORCE VECTOR. THE DIAGNOSIS WAS ESTABLISHED UPON THE SUBJECT'S TERMINATION OF HAZARDOUS DUTY AND SEPARATION FROM THE SERVICE, APPROXIMATELY ONE YEAR AFTER THE PRESUMPTIVE DATA OF INJURY. THIS DOCUMENTED INJURY REPRESENTS A DEMONSTRABLE ENDPOINT IN IMPACT TOLERANCE OF A SUBJECT EXPOSED TO AN ACCELERATION ENIVORNMENT WHICH CAN BE SPECIFICALLY DESCRIBED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-624 487 6/2 6/19 22/2
FROST ENGINEERING DEVELOPMENT CORP DENVER COLO
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS. (U)
DESCRIPTIVE NOTE: FINAL REPT. JUL 62-DEC 63,
OCT 65 112P PAYNE,PETER R. ;
CONTRACT: AF33(657)-9514
PROJ: AF-6301
TASK: 630102
MONITOR: AMRL , TR-65-127

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, SAFETY HARNESS), (*SAFETY HARNESS, OPTIMIZATION), STRESS(PHYSIOLOGY), HUMANS, MATHEMATICAL MODELS, BIOPHYSICS, AEROSPACE CRAFT, ANTHROPOMETRY, DYNAMICS, VIBRATION, DAMPING, BODY, MECHANICAL PROPERTIES (U)

LIKE ANY OTHER COMPLEX DYNAMIC SYSTEM THE HUMAN BODY RESPONDS IN A COMPLEX WAY TO ACCELERATION INPUTS WHICH VARY RAPIDLY WITH TIME. THE NEED TO AVOID STRESSES LARGE ENOUGH TO CAUSE INJURY TO THE BODY USUALLY IMPOSES LIMITS ON THE PERMISSIBLE INPUT ACCELERATION. THE RESTRAINT SYSTEM INTERPOSED BETWEEN A VEHICLE AND ITS OCCUPANT CAN MODIFY THE PHYSIOLOGICAL EFFECTS OF A VEHICLE'S ACCELERATION - TIME HISTORY. THIS MODIFICATION SHOULD BE MADE AS FAVORABLE AS POSSIBLE BY MINIMIZING THE STRESSES GENERATED IN THE VEHICLE'S OCCUPANT. TO DETERMINE OPTIMUM DYNAMIC CHARACTERISTICS FOR THE RESTRAINT SYSTEM, ITS IMPORTANT CHARACTERISTICS, AND THOSE OF THE HUMAN BODY, NEED TO BE REPRESENTED IN TERMS OF A MATHEMATICAL OR 'DYNAMIC' MODEL. THROUGH SUITABLE ANALYSIS, EITHER MATHEMATICAL OR BY MEANS OF A COMPUTER, THOSE DYNAMIC CHARACTERISTICS OF THE RESTRAINT SYSTEM CAN BE DETERMINED WHICH WILL MINIMIZE THE PEAK STRESSES DEVELOPED IN ITS HUMAN OCCUPANT. A GENERAL THEORY OF SUITABLE DYNAMIC MODELS IS DEVELOPED FOR THIS TYPE OF PROBLEM. CLOSED FORM SOLUTIONS FOR A NUMBER OF SIMPLE CASES ARE PRESENTED. IN ADDITION A METHOD IS SHOWN WHICH PERMITS DEVELOPMENT OF SIMPLE DYNAMIC MODELS FOR THE HUMAN BODY UTILIZING EXISTING EXPERIMENTAL DATA. (AUTHOR) (U)

UNCLASSIFIED

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-624 546 14/2 6/19 13/12
SOUTHWEST RESEARCH INST SAN ANTONIO TEX OEPT OF STRUCTURAL RESEARCH
A STUOY OF THE USAF SCHOOL OF AEROSPACE MEOICINE HUMAN CENTRIFUGE. (U)
OESCRIPTIVE NOTE: FINAL REPT., PHASE 1, OCT 65 35P EGGLESTON,L. A. ;JOHNSTON,R. K. ;PRYOR,A. J. ;
CONTRACT: AF41(609)-2715
PROJ: SWRI 03-1787

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

OESCRIPTORS: (•ACCELERATION TOLERANCE, LABORATORY EQUIPMENT), (•CENTRIFUGES, ACCELERATION TOLERANCE), (•FIRE SAFETY, CENTRIFUGES), HYORAULIC EQUIPMENT, HYDRAULIC FLUIDS, HAZAROS, FIRE ALARM SYSTEMS, FIRE EXTINGUISHERS, FOAMS, SPACE MEDICINE (U)

A STUOY WAS MADE OF THE FIRE HAZAROS PECULIAR TO THE EQUIPMENT AND OPERATION OF THE USAF SCHOOL OF AEROSPACE MEOICINE HUMAN CENTRIFUGE AT BROOKS AIR FORCE BASE, SAN ANTONIO, TEXAS. THIS STUOY WAS BASED ON PRESENT AIR FORCE STANDARDS. NO MAJOR HAZAROS WERE FOUNO, HOWEVER, RECOMMENDATIONS ARE PRESENTEO WHICH PROVIDE MORE IN-OEPTH PROTECTION FOR THE CENTRIFUGE AS IT NOW EXISTS. THE MAJOR RECOMMENDATION IS THE INSTALLATION OF A FIRE-FOG OELUGE SYSTEM (WITH ALARM) IN THE PUMP ROOM AND SUB-PIT WHERE THE STORAGE OF COMBUSTIBLES IS NECESSARY. (AUTHOR) (U)

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UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-624 626 6/19
AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
MAXIMUM VOLUNTARY VENTILATION AFTER + G SUB X IMPACT
IN HUMANS. (U)
DESCRIPTIVE NOTE: INTERIM REPT. FOR FEB 65,
NOV 65 18P HANSON,PETER G. ;
REPT. NO. TR-65-22

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE,
RESPIRATION), (*RESPIRATION,
STRESS(PHYSIOLOGY)), LUNGS, BLOOD
CIRCULATION, PATHOLOGY, HUMANS, ANXIETY,
STRESS(PSYCHOLOGY) (U)

EIGHTENN VOLUNTEER MALE SUBJECTS WERE EXPOSED TO 20
+ G SUB X IMPACT ON THE DAISY DECELERATOR.
MEASUREMENTS OF MAXIMUM VOLUNTARY VENTILATION
(MVV) OBTAINED 10 MINUTES PRIOR TO, IMMEDIATELY
AFTER AND 20 MINUTES AFTER IMPACT WERE COMPARED WITH
PREVIOUSLY DETERMINED BASELINE MVV VALUES. THE
RESULTS INDICATE THAT MVV PERFORMANCE IS ELEVATED
IMMEDIATELY AFTER IMPACT. IT IS SUGGESTED THAT
THIS RESPONSE IS RELATED TO SUBJECT ANXIETY WITH
ACCOMPANYING SYMPATHICOTONIA. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-629 254 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT
CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF +5GX AND +10GX. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 17P SANDLER,HAROLD ;
REPT. NO. NADC-MR-6501

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HEART, ACCELERATION TOLERANCE), (*ACCELERATION TOLERANCE, HEART), X-RAY PHOTOGRAPHY MOTION PICTURES, THORAX, STRESS(PHYSIOLOGY), HUMANS, RADIOGRAPHY (U)

X-RAY MOTION PICTURES WERE RECORDED FOR FIVE HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF +5GX AND +10GX ON THE JOHNSVILLE CENTRIFUGE. QUANTITATIVE MEASUREMENTS OF CHANGE IN A-P CHEST DIAMETER AND HEART POSITION WERE MADE FROM PHOTOGRAPHIC PRINTS OF THE FILMS. A SLIGHT BUT SIGNIFICANT POSTERIOR DISPLACEMENT OF HEART POSITION COULD BE DEMONSTRATED WHEN COMPARED TO CHANGE IN THE A-P CHEST DIAMETER. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-627 430 13/12 14/2
SOUTHWEST RESEARCH INST SAN ANTONIO TEX DEPT OF STRUCTURAL RESEARCH
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR. (U)
DESCRIPTIVE NOTE: FINAL REPT., PHASE 3,
DEC 65 16P PRYOR,A. J. ;EGGLESTON,L. A. ;JOHNSTON,R. K. ;
CONTRACT: AF41(609)-2715
PROJ: SWRI-03-1787

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*FLIGHT SIMULATORS, HYDRAULIC FLUIDS), (*CENTRIFUGES, HYDRAULIC FLUIDS), (*HYDRAULIC FLUIDS, FIRE SAFETY), MILITARY REQUIREMENTS, HAZARDS, TIME STUDIES, COSTS, SPACE MEDICINE, MECHANICAL DRAWINGS (U)

A STUDY WAS MADE OF THE FIRE HAZARDS PECULIAR TO THE EQUIPMENT AND OPERATION OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR AT BROOKS AIR FORCE BASE, TEXAS. THE STUDY WAS BASED ON PRESENT AIR FORCE STANDARDS AND RECOMMENDATIONS WERE OUTLINED IN PREVIOUS REPORTS WHERE HAZARDS EXCEEDED ACCEPTABLE LIMITS. THE REPORT CONTAINS COST AND TIME ESTIMATES FOR THE ACCOMPLISHMENT OF THE RECOMMENDATIONS REFERRED TO ABOVE. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AO-630 788 6719
AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EXPERIENCE PARAMETERS AND SUBJECT ACCELERATION RESPONSE IN EXPERIMENTAL IMPACT. (U)
DESCRIPTIVE NOTE: REPT. FOR FEB 65, MAR 66 24P FOSTER,PETER ;
REPT. NO. 6571-ARL-TR-66-8,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, HUMANS), IMPACT SHOCK, EXPOSURE, ELECTROCARDIOGRAPHY, BLOOD PRESSURE, RESPIRATION, STATISTICAL ANALYSIS, TABLES, SPACE MEDICINE (U)
IDENTIFIERS: EXPERIENCE (U)

STUDIES OF HUMAN TEST SUBJECTS UNDERGOING SUSTAINED ACCELERATION ON THE CENTRIFUGE HAVE SHOWN THAT TOLERANCE INCREASES WITH EXPERIENCE. THIS FACT SUGGESTED THE NEED FOR AN INVESTIGATION TO DETERMINE IF A SIMILAR RELATIONSHIP EXISTED BETWEEN CERTAIN IMPACT EXPERIENCE PARAMETERS AND SUBJECT ACCELERATION RESPONSE, WHICH WAS USED AS AN INDICATOR OF SUBJECT TOLERANCE TO IMPACT EXPOSURE. A NUMBER OF HUMAN TEST SUBJECTS HAVING VARYING DEGREES OF EXPERIENCE WITH EXPERIMENTAL IMPACT ACCELERATION WERE EXPOSED TO IDENTICAL IMPACT PROFILES. CORRELATIONS OF EXPERIENCE FACTORS TO INDICATED TOLERANCE SHOWED NO SIGNIFICANT RELATIONSHIP. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-630 991 6/13
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HISTOMORPHOLOGICAL CHANGES IN THE INTERNAL EAR OF DOGS UNDER THE EFFECT OF RADIAL ACCELERATIONS, (U)
MAR 66 13P MARKARYAN,S. S. ;KOGAN,R. E.

REPT. NO. FTD-TT-65-1356,
MONITOR: TT , 66-60995

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF VESTNIK OTO-RINO LARINGOLOGII (USSR) V26 N2 P17-21 1964.

DESCRIPTORS: (*ACCELERATION TOLERANCE, EAR), (*EAR, HEMORRHAGE), ACCELERATION, GRAVITY, BLOOD CIRCULATION, LYMPH, HISTOLOGY, MORPHOLOGY(BIOLOGY), TISSUES(BIOLOGY), OTORHINOLARYNGOLOGY, REVIEWS, DOGS, USSR (U)

TWELVE DOGS WERE SUBJECTED TO THE ACTION OF ACCELERATIONS WITHIN THE LIMITS OF 2.4 - 14.5G, THE TIME RANGING FROM 4 TO 20 MINUTES. IN THE INTERNAL EAR OF DOGS, THE VENOUS CIRCULATION BECAME DISTURBED, THIS RESULTING IN PROTRACTED HEMORRHAGES IN THE PERILYMPHATIC SPACES OF THE COCHLEA AND SUBEPITHELIAL CONNECTIVE TISSUE OF SACE AND AMPULES. HEMORRHAGES IN THE INTERNAL EAR RESOLVED MUCH SLOWER THAN HEMORRHAGES OCCURING IN THE MIDDLE EAR OR IN THE INTERNAL ACOUSTIC MEATUS. (AUTHOR) (U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-632 681 6/19
KAROLINSKA INSTITUTET STOCKHOLM (SWEOEN) LABS OF AVIATION AND NAVAL MEDICINE
BLOOO GAS CHANGES IN THE ANESTHETIZED DOG OURING PROLONGED EXPOSURE TO POSITIVE RAOIAL ACCELERATION. (U)
OEC 58 14P BARR,P. -O. ;BJURSTEOT,H. ; COLERIOGE,J. C. G. ;
CONTRACT: AF 61(052)-153,

UNCLASSIFIEO REPORT
AVAILABILITY: PUBLISHEO IN ACTA PHYSIOLOGICA SCANOINAVICA V47 N1 P16-27 1959.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (•ACCELERATION TOLERANCE, RESPIRATION), GASES, BLOCD ANALYSIS, GRAVITY(ARTIFICIAL), STRESS(PHYSIOLOGY), OXYGEN, CARBON DIOXIDE, ACIO-BASE EQUILIBRIUM, PH, HYPERVENTILATION, LUNGS, HEART, DOGS, SWEOEN (U)
IOENTIFIERS: HYPOCAPNIA, HYPOXEMIA (U)

ANESTHETIZEO OOGS WERE EXPOSED TO INCREASED GRAVITATIONAL STRESS IN THE HEAD-TO-TAIL DIRECTION AND ARTERIAL 02 SATURATION ANO ACIO-BASE BALANCE CHANGES STUOIEO. SIMULTANEOUS, OIRECT AND CONTINUOUS RECOROINGS WERE MAOE OF ARTERIAL 02 SATURATION ANO PH AS WELL AS RESPIRATORY MINUTE VOLUME IN CENTRIFUGE RUNS. APPLICATION OF MOOERATE G FORCES OVER SEVERAL MINUTES PROOUCEO SEVERE HYPOXEMIA ALTHOUGH IOO% 02 WAS BREATHEO ANO HYPERVENTILATION WAS PRESENT, INDICATING A GREAT ALVEOLAR-ARTERIAL 02 OIFFERENCE, ANO ACCORDINGLY, A LARGE INTRAPULMONARY SHUNT. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AO-632 817 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT
HUMAN BIOCHEMICAL PARAMETERS OF ACCELERATIVE STRESS. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
APR 66 20P YORK,ELIHU I
REPT. NO. NADC-MR-6603,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, BIOCHEMISTRY), (*ACCELERATION, STRESS(PHYSIOLOGY)), PHOSPHOLIPIDS, BLOOD, GLUCOSE, BLOOD CHEMISTRY, BLACKOUT(PHYSIOLOGY), EPINEPHRINE, METABOLISM, HUMANS (U)
IDENTIFIERS: GREYOUT(PHYSIOLOGY) (U)

ACCELERATION STRESS CONDITIONS WERE IMPOSED ON FOUR HEALTHY SUBJECTS RIDING THE HUMAN CENTRIFUGE. BLOOD BIOCHEMICAL ANALYSES WERE PERFORMED ON ALL SUBJECTS, WITH THE DEMONSTRATION OF AN INCREASE IN BLOOD GLUCOSE FOLLOWING CENTRIFUGATION IN THREE OF THE FOUR SUBJECTS, TWO OF WHOM DEVELOPED 'BLACKOUT'. ALL FOUR SUBJECTS DEVELOPED 'GREYOUT', THE CHANGES IN BLOOD SUGAR MAY SUGGEST A RELATIONSHIP BETWEEN EPINEPHRINE SECRETION AND GRADUATED ACCELERATION STRESS RESULTING IN PHYSIOLOGICAL CHANGES IN THE SUBJECT. CHANGES IN POOLED PLASMA PHOSPHOLIPID FRACTIONS WERE DEMONSTRATED IN BLOOD SAMPLES OBTAINED BEFORE AND FOLLOWING ACCELERATION; THESE CHANGES SUGGEST THAT ACCELERATION MAY INTERFERE WITH INTRACELLULAR ENERGY TRANSFER MECHANISMS INVOLVING PHOSPHORYLATED COMPOUNDS ASSOCIATED WITH OXIDATIVE METABOLISM. THE PRELIMINARY RESULTS OF THE PILOT PROJECT INDICATE THAT FURTHER BIOCHEMICAL MEASUREMENTS MAY BE DESIRABLE IN ASSESSING ACCELERATION TOLERANCE IN MAN. (AUTHOR) (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AO-633 473 6/19
NAVAL AIR OEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEOICAL RESEARCH OEPT
OISTRIBUTION OF PULMONARY BLOOO FLOW AS AFFECTEO BY TRANSVERSE (+GX) ACCELERATION. (U)
OESCRIPTIVE NOTE: FINAL REPT.,
OEC 65 32P HOPPIN JR,FREDERIC G. ;
YORK,ELIHU ;KUHL,OAVIO E. ;HYOE,RICHARO W. ;

REPT. NO. NAOC-MR-6517,
CONTRACT: AT(30-1)-2175,PHS-C-4456
MONITOR: NAVMEO ,NYO MROO5.13-0002.18-2 ,2175-20

UNCLASSIFIEO REPORT

SUPPLEMENTARY NOTE:

OESCRIPTORS: (*LUNGS, *ACCELERATION TOLERANCE), (*BLOOO CIRCULATION, ACCELERATION TOLERANCE), HYDROSTATIC PRESSURE, RAOIOACTIVE ISOTOPES, BLOOD VESSELS, STRESS(PHYSIOLOGY) (U)

THE OISTRIBUTION OF BLOOO FLOW IN THE PULMONARY VASCULAR BEO UNOER +GX (FORWARO OR TRANSVERSE ACCELERATION) WAS STUOIED BY THE INTRAVENOUS INJECTION OF RAOIOACTIVE 131 IOOINATED-MACRO AGGREGATEO ALBUMIN (131I-MAA) IN THREE NORMAL SUBJECTS WHILE THEY WERE UNOER +1GX, +4GX ANO +8GX ON A HUMAN CENTRIFUGE. THE RESULTING OISTRIBUTION OF RAOIOACTIVITY IN THE LUNGS, REPRESENTING THE OISTRIBUTION OF PULMONARY BLOOO FLOW AT THE TIME OF INJECTION, WAS ASSESSEO ONE TO THREE HOURS LATER BY LATERAL RAOIOISOTOPE SCANNING. THE OISTRIBUTION OF PULMONARY BLOOO FLOW WAS NOT MARKEOLY OIFFERENT AT +1GX, +4GX, AND +8GX OESPITE A HYOROSTATIC GRAOIENT IN PULMONARY INTRAVASCULAR PRESSURES ESTIMATEO TO BE 88 MM HG UNOER +8GX. THESE FINOINGS INOICATE THAT UNOER +GX (FORWARO OR TRANSVERSE ACCELERATION) UNLIKE +GZ (HEADWARO OR POSITIVE ACCELERATION) THE OISTRIBUTION OF PULMONARY BLOOO FLOW IS NOT MARKEOLY OISTORTEO, AND THAT THE REGIONAL FLOW OF BLOOD IN THE LUNG MAY NOT BE SIGNIFICANTLY CHANGEO BY HIGH INTRAVASCULAR PRESSURES. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-633 705 6/19
ARMY MEDICAL RESEARCH LAB FORT KNOX KY
ACQUISITION AND RETENTION OF NYSTAGMIC HABITUATION IN CATS WITH DISTRIBUTED ACCELERATION EXPERIENCE, (U)
FEB 65 9P BROWN,JAMES H. ;
REPT. NO. USAMRL-657,
PROJ: 0A-3A014501B71P,
TASK: 08,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF COMPARATIVE AND PHYSIOLOGICAL PSYCHOLOGY V60 N3 P340-3 1965.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (•NYSTAGMUS, •ACCELERATION TOLERANCE), VESTIBULAR APPARATUS, AVIATION MEDICINE, CATS (U)
IDENTIFIERS: HABITUATION (U)

FIFTY CATS WERE EXPOSED TO A LONG SERIES OF ANGULAR ACCELERATIONS DURING WHICH EXPERIMENTAL SESSIONS WERE DISTRIBUTED FROM 1 TO 14 DAYS. A HIGHLY SIGNIFICANT NYSTAGMUS RESPONSE DECLINE (HABITUATION) RESULTED FROM THIS REPEATED EXPOSURE TO ANGULAR ACCELERATION. WHILE THE ACQUISITION OF NYSTAGMIC HABITUATION WAS NOT INFLUENCED BY DIFFERENT DISTRIBUTIONS OF ACCELERATION EXPERIENCE, RETENTION WAS SYSTEMATICALLY AFFECTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-634 080 6/19
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS, (U)
66 7P URSCHEL,CHARLES W. ;HOOD JR,WILLIAM B. ;
REPT. NO. AMRL-TR-65-56,
PROJ: AF-7222,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, *CARDIOVASCULAR SYSTEM), (*ROTATION, STRESS(PHYSIOLOGY)), ARTERIES, VEINS, CANNULATION, BLOOD PRESSURE, BLOOD VOLUME, TOLERANCES(PHYSIOLOGY) (U)

ROTATION OF THE SEATED SUBJECT ABOUT THE Z AXIS (RZ) RESULTS IN A RADIAL ACCELERATION GRADIENT IMPEDING VENOUS RETURN THEREBY REPRESENTING A CARDIOVASCULAR STRESS. THE CARDIOVASCULAR RESPONSES OF VOLUNTEER SUBJECTS INSTRUMENTED WITH INDWELLING ARTERIAL AND VENOUS CATHETERS WERE MEASURED DURING FOUR ROTATIONAL PROFILES COMBINING TWO RATES OF ANGULAR ACCELERATION (0.1 AND 0.8 RADIANS PER SECOND PER SECOND) AND TWO ROTATIONAL SPEEDS (60 AND 120 RPM). THERE WAS A THREE-MINUTE PLATEAU AT PEAK VELOCITY. CENTRIPETAL ACCELERATION AT HAND/FOOT RADIUS (0.5 METERS) WAS 1.8 AND 7.4G AT 60 AND 120 RPM, RESPECTIVELY. ROTATION AT 60 RPM REPRESENTED NO SIGNIFICANT STRESS. THREE MINUTE 120 RPM RUNS HOWEVER CAUSED PROGRESSIVE TACHYCARDIA, NARROWING OF PULSE PRESSURE, AND A DROP IN MEAN ARTERIAL PRESSURE, THUS INFERENTIALLY A DROP IN CARDIAC OUTPUT. TOLERANCE WOULD THUS BE EXPECTED TO BE LIMITED BY THE ABILITY OF THE CIRCULATION TO MAINTAIN VENOUS RETURN. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-634 919 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT
CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (+GZ) ACCELERATION. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
APR 66 18P YORK, ELIHU ;BROWN,KENNETH R. ;GOLOFIEN,AALAN ;
REPT. NO. NAOC-MR-6602,
MONITOR: NAVMED MR005.13-0002.19-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, *AMINES), (*EPINEPHRINE, EXCRETION), MOTION SICKNESS, VESTIBULAR APPARATUS, STRESS(PHYSIOLOGY), BLOOD PLASMA, URINE, MEASUREMENT (U)
IDENTIFIERS: CATECHOLAMINES (U)

FIVE NORMAL SUBJECTS AND TWO LABYRINTHINE-DEFECTIVE SUBJECTS WERE EXPOSED TO ACCELERATION PROFILES CONSISTING OF LINEAR, ANGULAR AND COMBINED (LINEAR PLUS ANGULAR) STRESS. CATECHOL AMINES WERE MEASURED IN PLASMA AND URINE FOR BOTH GROUPS. A DEMONSTRATED RISE IN PLASMA NOR-EPINEPHRINE OCCURRED IN TWO OF THE FIVE NORMAL SUBJECTS, BOTH OF WHOM DEVELOPED MOTION SICKNESS FOLLOWING A 'COMBINED' ACCELERATION STRESS. THE NORMAL GROUP HAD MEASURABLE PLASMA EPINEPHRINE LEVELS, UNDER MOST CIRCUMSTANCES, WHEREAS THE LABYRINTHINE DEFECTIVE GROUP HAD NONE. ALTHOUGH THERE IS INSUFFICIENT DATA TO MAKE A CLEAR-CUT SEPARATION BETWEEN DIFFERENT TYPES OF ACCELERATION STRESS IN THE TWO GROUPS, AND THEIR ASSOCIATED BIOCHEMICAL RESPONSES; NEVERTHELESS, THERE IS SOME EVIDENCE TO SUGGEST THAT THE INTACT LABYRINTH IS A FACTOR INFLUENCING ELABORATION OF CATECHOL AMINES, WHICH IN TURN MAY BE IMPLICATED IN THE DEVELOPMENT OF MOTION SICKNESS. (AUTHOR) (U)

UNCLASSIFIED

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-634 609 6/19
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
BIOCHEMICAL CHANGES OCCURRING WITH ADAPTATION TO ACCELERATIVE FORCES DURING ROTATION, (U)
APR 66 15P COLEHOUR, JAMES K. ; GRAYBIEL,ASHTON ;
REPT. NO. NAMI-959,
CONTRACT: NASA ORDER-R-93,
MONITOR: NAVMED MR005.13-0004.2.3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*MOTION SICKNESS, BIOCHEMISTRY), (*ADAPTATION(PHYSIOLOGY), BIOCHEMISTRY), (*ACCELERATION TOLERANCE, BIOCHEMISTRY), ROTATION, STRESS(PHYSIOLOGY), EXCRETION, CORTICOSTEROID AGENTS, EOSINOPHILS, HYPERVENTILATION, LEVARTERENOL, EXCRETION, CONFINED ENVIRONMENTS (U)
IDENTIFIERS: EOSINOPENIA, HYPERCALCIURIA,HYPERCAPNIA, RECUMBENCY EFFECTS (U)

FOUR YOUNG MEN LIVED IN A CONTINUALLY ROTATING ROOM, 15 FEET IN DIAMETER, FOR A PERIOD OF SIX DAYS. ROTATIONAL VELOCITIES ON SUCCEEDING DAYS WERE: 6.4, 6.4, 8.6, 10.0, 6.4, AND 3.2 RPM. STRESS EFFECTS MEASURED AS INCREASED EXCRETION RATES OF 17, 21 DIHYDROXYPREGNANE-20-ONES, EOSINOPENIA, HYPERVENTILATION, AND NAUSEA WERE OBSERVED ON THE FIRST DAY OF ROTATION. HOWEVER, ADAPTATION WAS RAPID, AND NO FURTHER STRESS EFFECTS WERE OBSERVED EVEN WITH INCREASED ROTATIONAL VELOCITY. MILD DEGREES OF HYPERCALCIURIA, HYPERCAPNIA, AND DECREASED NOREPINEPHRINE EXCRETION RATES WERE OBSERVED DURING THE LAST FOUR DAYS OF THE EXPERIMENT AS A RESULT OF THE INCREASED TIME SPENT IN RECUMBENCY. (AUTHOR) (U)

UNCLASSIFIED

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DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-639 719 6/19
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
HUMAN TOLERANCE TO GZ 100 PER CENT GRADIENT SPIN. (U)
66 10P PIEMME, THOMAS E. ;
REPT. NO. AMRL-TR-65-57,
PROJ: AF-7222,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V37 N1 P16-21 JAN 1966.
SUPPLEMENTARY NOTE: PRESENTED AT THE AEROSPACE MEDICAL ASSOCIATION MEETING, NEW YORK CITY, APRIL 28, 1965.

DESCRIPTORS: (*ACCELERATION TOLERANCE, SPIN), STRESS(PHYSIOLOGY), CARDIOVASCULAR SYSTEM, RESPIRATION, ELECTROCARDIOGRAPHY (U)

SEVEN AIR FORCE VOLUNTEERS WERE STUDIED ON A SHORT RADIUS (4 FOOT, 9 INCH) SPIN TABLE WITH THE SUBJECT RESTRAINED IN THE SUPINE POSITION, THE Z-AXIS ALONG THE RADIUS. ZERO GZ WAS EFFECTIVELY ACHIEVED AT EYE LEVEL; MAXIMUM G AT THE FEET. AT TWO ARBITRARILY SELECTED RATES OF ONSET (0.10 G PER SECOND AND 0.05 PER SECOND) THE TOLERANCE TO LEVELS UP TO 7G MAXIMUM AT THE FEET HAS BEEN DETERMINED. ELECTROCARDIOGRAM AND RESPIRATION WERE MONITORED. TOLERANCE END-POINTS WERE DEFINED AS PERIPHERAL LIGHT LOSS, CARDIAC RATES IN EXCESS OF 170 PER MINUTE, OR THE ONSET OF SUCH SUBJECTIVE SYMPTOMS AS NAUSEA, SWEATING, OR LIGHTTHEADEDNESS. A LOGARITHMIC TIME DURATION CURVE MAY BE CONSTRUCTED FROM 7 G, TOLERABLE FOR 2 MIN. 41 SEC., THROUGH 1 G, TOLERABLE IN EXCESS OF TWO HOURS (AT WHICH EXPERIMENTS WERE ARBITRARILY TERMINATED). THIS CLEARLY EXCEEDS TOLERANCE TO STANDARD LONG ARM CENTRIFUGE ACCELERATION. AT HIGH G LEVELS, GREY-OUT AND TACHYCARDIA WERE FOUND TO BE LIMITING; IN THE MID-ZONE RANGE MUSCULDSKELETAL DISCOMFORT OF THE BACK AND LOWER EXTREMITIES WAS PROMINENT, BUT NOT AS LIMITING AS IN STANDARD LOW GRADIENT + GZ PROFILES. CORIOLIS PHENOMENA WERE MARKED, AND DEMANDED FIXATION OF HEAD POSITION. HEMATECRITS AND FREE FATTY ACIDS DID NOT CHANGE AS A FUNCTION OF G LOAD. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-636 474 6/19
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
THE EFFECT OF ACCELERATIONS ON THE VESTIBULAR ANALYZER: BIBLIOGRAPHY. (U)
JUN 66 25P SMITH, JANICE L. ;
REPT. NO. ATD-66-62,
MONITOR: TT 66-61894

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON SURVEYS AND FOREIGN SCIENTIFIC AND TECHNICAL LITERATURE.

DESCRIPTORS: (*SPACE MEDICINE, VESTIBULAR APPARATUS), (*VESTIBULAR APPARATUS, BIBLIOGRAPHIES), (*ACCELERATION TOLERANCE, VESTIBULAR APPARATUS), STRESS(PHYSIOLOGY), OTORHINOLARYNGOLOGY, WEIGHTLESSNESS, ELECTROENCEPHALOGRAPHY, EAR, CEREBRAL CORTEX, STIMULATION, REFLEXES, MOTION SICKNESS, SPACE PERCEPTION, TRAINING, DOGS, USSR (U)

THE BIBLIOGRAPHY WAS COMPILED FROM SOVIET OPEN SOURCES PUBLISHED 1955-1966 TOGETHER WITH 5 WESTERN SOURCES. IT IS THE FIRST REPORT IN A SERIES AND DEALS WITH THE EFFECT OF ANGULAR, IMPACT, AND CORIOLIS ACCELERATIONS ON THE VESTIBULAR MECHANISM. THE BIBLIOGRAPHY IS DIVIDED INTO TWO SECTIONS. THE FIRST SECTION CONSISTS OF 112 ITEMS WHICH ARE CONSIDERED OF PRIMARY INTEREST. THE SECOND PART CONTAINS 27 ITEMS CONSIDERED OF SECONDARY INTEREST BECAUSE THEY CONTAIN ELEMENTARY OR BACKGROUND INFORMATION OR HAD ONLY A FEW RELEVANT PARAGRAPHS. PERTINENT INFORMATION INCLUDES: DIAGNOSTIC VALUE OF LABYRINTHINE REACTIONS, CHANGES IN THE FREQUENCY SPECTRUM OF AN ENCEPHALOGRAM DURING VESTIBULAR AND OPTOKINETIC STIMULATION, CORTICAL REGULATION OF VESTIBULAR REACTIONS, STIMULATION OF THE VESTIBULAR APPARATUS OF A DOG, DEVELOPMENT OF CONDITIONED VESTIBULAR REFLEXES, BIOLOGICAL AND PHYSIOLOGICAL STUDIES IN ROCKET AND SATELLITE FLIGHTS, PHYSIOLOGICAL EFFECTS OF GRAVITATION, SPATIAL ORIENTATION, EQUIPMENT FOR STUDY OF THE VESTIBULAR ANALYZER, EFFECT OF PROLONGED ACCELERATION, MOTION SICKNESS, VESTIBULAR TRAINING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-636 723 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT
PULMONARY FUNCTION IN MAN UNDER PROLONGED ACCELERATION II. CORRELATION OF ARTERIAL BLOOD OXYGEN SATURATION WITH VENTILATION AND GAS BEING BREATHED. (U)
DESCRIPTIVE NOTE: FINAL REPT.
DEC 65 23P HOPPIN JR, FREDERIC C. ;
SEVER,RAYMOND J. ;
REPT. NO. NAOC-MR-6519,
TASK: RAI50J-059/2021/F022-01-03,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, *RESPIRATION), BLOOD ANALYSIS, OXYGEN, VOLUME, LUNGS, EAR, OXIMETERS (U)

ARTERIAL BLOOD OXYGEN SATURATION WAS STUDIED BY EAR OXIMETRY IN 8 SUBJECTS UNDERGOING PROLONGED FORWARD (+GX) ACCELERATION. THE EFFECTS ON SATURATION OF VOLUNTARY BREATHING PATTERNS AND THE COMPOSITION OF THE INSPIRED GAS WERE NOTED. UNDER +4GX SATURATION LEVELS WERE STABLE AFTER TWO MINUTES. THE DEGREE OF UNSATURATION COULD BE MODIFIED TO A SMALL EXTENT BY VOLUNTARY BREATHING EFFORTS. THE LEVEL OF SATURATION REACHED CORRELATED SIGNIFICANTLY WITH THE MINUTE VOLUME BREATHED. IN CONTRAST, UNDER +8GX SATURATION LEVELS WERE SIGNIFICANTLY LOWER AND WERE STILL FALLING AFTER TWO MINUTES. SATURATION LEVELS WERE NOT SIGNIFICANTLY CHANGED BY VOLUNTARY BREATHING EFFORTS AND THERE WAS NO SIGNIFICANT CORRELATION BETWEEN LEVEL OF SATURATION REACHED AND MINUTE VOLUME BREATHED. BREATHING OF OXYGEN DELAYED THE ONSET OF ARTERIAL BLOOD OXYGEN UNSATURATION. AFTER TWO MINUTES UNDER +8GX, LEVELS WERE 20% HIGHER WHEN THE SUBJECTS BREATHED OXYGEN THAN WHEN THEY BREATHED AIR. WHEN SUBJECTS CHANGED FROM AIR TO OXYGEN OR FROM OXYGEN TO AIR ON ATTAINING PEAK ACCELERATION, THE EFFECTS OF THE 'PREBREATHED' GAS WERE APPARENT FOR AS LONG AS TWO MINUTES, SUGGESTING THAT THE PREBREATHED GAS WAS EFFECTIVELY TRAPPED IN SOME PARTS OF THE LUNG. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIDGRAPHY SEARCH CDNTRDL ND. ZDD529

AD-637 182 6/19
TECHNDLDGY INC DAYTON DHIO
THE MDTION DF THE HUMAN CENTER DF MASS AND ITS RELATIONSHIP TD THE MECHANICAL IMPEDANCE. (U)
DESCRIPTIVE NDTE: FINAL REPT., 1 JAN-31 DEC 64.
JUN 66 25P WEIS,EDMUND B. , JR. ;
PRIMIANO,FRANK P. , JR;
CDNTRACT: AF 33(657)-10010,
PRDJ: AF-7231,
TASK: 723101,
MONITDR: AMRL TR-65-50

UNCLASSIFIED REPDRT

SUPPLEMENTARY NOTE:

DESCRIPTDRS: (•CENTER DF MASS, HUMANS), (•ACCELERATIDN TOLERANCE, CENTER DF MASS), VELDCITY, DAMPING, FDRCE(MECHANICS), ACCELERATION, MDTION, BIDPHYSICS, STRESS(PHYSIOLOGY), VIBRATIDN, FUNCTIONS, INTEGRAL TRANSFORMS, EQUATIDNS DF MOTIDN (U)
IDENTIFIERS: BIDMECHANICS (U)

THE REPORT CDNCERNS THE DEVELOPMENT OF A RELATIONSHIP BETWEEN THE HUMAN MECHANICAL IMPEDANCE AND THE COUPLING OF THE HUMAN CENTER DF MASS TO THE ENVIRONMENT. THE MECHANICAL IMPEDANCE IS A COMMON ANALYSIS TDOL IN BIDMECHANICS WHILE THE ANALYSIS DF THE CDUPLING DF THE CENTER OF MASS TO THE ENVIRONMENT IS TECHNICALLY MDRE DIFFICULT, IF NOT IMPDSSIBLE. THE DEVELOPMENT IS BASED DN LINEAR, PASSIVE, ISOTROPIC THEDRY AND SHDWS THAT THE TRANSFER FUNCTIDN WHICH EXPRESSES THE RELATION BETWEEN THE MOTION OF THE CENTER OF MASS ANO THE MDTIDN DF THE SOURCE IS SIMILAR TD A LINEAR SECOND ORDER MECHANICAL SYSTEM IN EACH OF THE TRANSLATIONAL SPATIAL DEGREES DF FREEDOM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 200929

AD-637 184 6/19 6/14
WILFORD HALL HOSPITAL (AIR FORCE) LACKLAND AFB TEX
AEROSPACE MEDICAL LAB (CLINICAL)
PHYSICAL CONDITIONING VERSUS +GZ TOLERANCE. (U)
66 7P COOPER,KENNETH H. ;
REPT. NO. AMLC-TR-66-2,
PROJ: AF-7756,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V37 N5 P462-5 MAY 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PHYSICAL FITNESS, *ACCELERATION TOLERANCE), (*ENDURANCE, TRAINING), ASTRONAUTS, STRESS(PHYSIOLOGY), EXERCISE, OXYGEN CONSUMPTION, SPACE MEDICINE (U)

ENDURANCE TRAINING APPEARS TO INCREASE THE PILOT'S RESISTANCE TO OTHER ENVIRONMENTAL STRESSES ENCOUNTERED IN FLIGHT, BUT IT HAS NO EASILY DEFINABLE EFFECT ON +GZ (FOR POSITIVE G) TOLERANCE. AN ATTEMPT WAS MADE IN THIS STUDY TO DETERMINE THE EFFECT OF ENDURANCE TRAINING ON +GZ TOLERANCE IN EXPERIENCED CENTRIFUGE SUBJECTS. ELEVEN SUBJECTS WERE DIVIDED INTO SIX EXERCISERS AND FIVE CONTROLS. FOR THREE MONTHS THE EXERCISERS ENGAGED IN A DAILY (FIVE TIMES A WEEK) PROGRESSIVE RUNNING PROGRAM WHILE THE CONTROLS WERE ASKED TO AVOID VIGOROUS EXERCISE. FREQUENTLY DURING THIS PERIOD, ALL ELEVEN SUBJECTS WERE SUBJECTED TO BOTH RAPID ONSET AND GRADUAL ONSET RUNS ON THE USAF SCHOOL OF AEROSPACE MEDICINE CENTRIFUGE. AT THE CONCLUSION OF THE THREE MONTHS, SIGNIFICANT DIFFERENCES WERE NOTICED BETWEEN THE EXERCISE AND CONTROL GROUPS IN ENDURANCE CAPACITY AS INDICATED BY AN INCREASE IN MAXIMAL OXYGEN CONSUMPTION. HOWEVER, NO SIGNIFICANT DIFFERENCE WAS NOTED BETWEEN THE TWO GROUPS IN THEIR ABILITY TO TOLERATE POSITIVE GS DURING EITHER GRADUAL OR RAPID ONSET CENTRIFUGE RUNS. IN THIS STUDY, NEITHER AN INCREASE NOR A DECREASE IN +GZ TOLERANCE COULD BE CORRELATED WITH ENDURANCE CAPACITY. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-638 719 6/19
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.
JUL 66 IOP HENZEL,J. H. ;CLARKE,N. P. ; MOHR,G. C. ;
REPT. NO. AMRL-TR-65-68,
PROJ: AF-7231,
TASK: 723101,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V37 N7 P682-7 JULY 1966.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VIBRATION, PAIN), (*ACCELERATION TOLERANCE, *PAIN), THRESHOLDS(PHYSIOLOGY), ANESTHESIA, NERVES, THORAX (U)

IN INVESTIGATING THE ORIGIN OF CHEST PAIN ASSOCIATED WITH GZ PLUS OR MINUS NGZ AND GX PLUS OR MINUS NGX SINUSOIDAL VIBRATION, THE EFFECT OF ANTERIOR CHEST WALL ANESTHETIZATION WAS STUDIED. SUBJECTS WERE EXPOSED TO VIBRATION OF INCREASING AMPLITUDE AND THE ACCELERATION REQUIRED TO INDUCE PERCEPTIBLE CHEST PAIN WAS TAKEN AS THE THRESHOLD. TWO RANDOMLY ORDERED THRESHOLD DETERMINATIONS WERE MADE IN EACH TEST. IN ONE, VIBRATION WAS PRECEDED BY BILATERAL ANESTHETIZATION OF THE SECOND THROUGH SIXTH INTERCOSTAL NERVES. IN THE OTHER, INTRADERMAL INFILTRATION OF ANESTHETIC CREATED A SENSATION SOMEWHAT SIMILAR TO THIS WITHOUT ACTUALLY BLOCKING THE NERVES; THIS PROVIDED A CONTROL CONDITION WITH MINIMAL SUBJECTIVE BIAS FOR COMPARISON. SUBSEQUENT TO INTERCOSTAL NERVE BLOCK, THERE WAS A STATISTICALLY SIGNIFICANT (P<0.01) INCREASE IN THRESHOLD OF CHEST PAIN FOR BOTH ORIENTATIONS OF VIBRATION. THESE RESULTS STRONGLY SUGGEST THAT VIBRATION INDUCED CHEST PAIN ORIGINATES IN THE CHEST WALL AND NOT IN THE MORE CRITICAL CARDIAC-GREAT VESSEL COMPLEX. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-638 792 6/19 6/16 6/2
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS. (U)
DESCRIPTIVE NOTE: FINAL REPT., JUL 63-JUL 64.
JUN 66 30P WEIS,EDMUND B. ;
CLARKE,NEVILLE P. ;VON GIERKE,HENNING E. ;
REPT. NO. AMRL-TR-66-84,
PROJ: AF-7231,
TASK: 723101,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ACCELERATION TOLERANCE, HUMAN ENGINEERING), (*VIBRATION, TOLERANCES(PHYSIOLOGY)), STRESS(PHYSIOLOGY), TEST METHODS, BIOPHYSICS, FUNCTIONS (U)
IDENTIFIERS: MECHANICAL IMPEDANCE, BIOMECHANICS (U)

THE REPORT PRESENTS NEW MEASUREMENTS OF MECHANICAL IMPEDANCE IN THE TRANSIENT ACCELERATION ENVIRONMENT AND COMPARES THE RESULTS WITH PREVIOUS MEASUREMENTS MADE IN THE STEADY STATE SINUSOIDAL ACCELERATION ENVIRONMENT. ALTHOUGH THERE ARE SOME DISCREPANCIES WHICH AWAIT FURTHER CLARIFICATION, THE TRANSFER FUNCTION OBTAINED UNDER THESE TWO ENVIRONMENTS SHOW ENCOURAGING GENERAL CORRELATION. WITH FURTHER SOPHISTICATION OF THE METHOD, THE TRANSIENT IMPEDANCE MEASUREMENT SHOWS CONSIDERABLE POTENTIAL IN THAT A SINGLE TEST FURNISHES DATA OVER A SPECTRUM OF FREQUENCIES AND PROVIDES A MORE GENERAL EXCITATION CONDITION. ALTHOUGH IT HAS ONLY BEEN RECENTLY EMPLOYED FOR THIS PURPOSE, THE PRACTICAL USEFULNESS OF THE IMPEDANCE METHOD AS A MEANS OF ESTABLISHING DESIGN CRITERIA FOR PROTECTION SYSTEMS IS MOST ENCOURAGING. WITH FURTHER DEFINITION OF THE MECHANODYNAMIC PROPERTIES OF THE BODY OF PROTECTION SYSTEM COMPONENTS, IT APPEARS REASONABLE THAT BIOMECHANICS CAN ACHIEVE THE GOAL OF PROVIDING OPTIMIZED PROTECTION AGAINST THE INCREASINGLY SEVERE MECHANICAL ENVIRONMENTS GENERATED IN AEROSPACE VEHICLES AND GROUND TRANSPORTATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-641 418 6/19 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY
CONCOMITANT VISUAL STIMULATION DOES NOT ALTER HABITUATION OF NYSTAGMIC, OCULOGYRAL OR PSYCHOPHYSICAL RESPONSES TO ANGULAR ACCELERATION, (U)
APR 65 22P BROWN,JAMES H. ;
CRAMPTON,GEORGE H. ;
PROJ: DA-3A014501B71P
TASK: 08
MONITOR: USAMRL 664

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN ACTA OTO-LARYNG V61 P80-91 1965.

DESCRIPTORS: (*NYSTAGMUS, *ACCELERATION TOLERANCE), VESTIBULAR APPARATUS, PSYCHOPHYSIOLOGY, STIMULATION, VISION, TEST METHODS (U)
IDENTIFIERS: HABITUATION (U)

CONCOMITANT VISUAL STIMULATION, VARIED BETWEEN FOUR GROUPS OF 20 YOUNG MEN EACH FROM TOTAL DARKNESS TO FULL ROOM ILLUMINATION, WAS INTRODUCED ON HABITUATION TRIALS THAT WERE INTERPOLATED BETWEEN TEST TRIALS. ALTHOUGH HIGHLY SIGNIFICANT DECREMENTS FOR NYSTAGMIC, OCULOGYRAL AND PSYCHOPHYSICAL RESPONSES WERE FOUND WITH REPEATED TESTING, THE DIFFERENT VISUAL CONDITIONS IN NO WAY ALTERED THIS HABITUATION. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-643 882 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
CARDIAC ARRHYTHMIAS OCCURRING DURING
ACCELERATION. (U)
DESCRIPTIVE NOTE: TECHNICAL REPT.,
JAN 66 11P TORPHY,D. E. ;LEVERETT,S. D. ;
LAMB,L. E. ;
REPT. NO. SAM-TR-65-293
TASK: 793003

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V37
N1 P52-8 JAN 1966.

DESCRIPTORS: (*ARRHYTHMIA, *ACCELERATION
TOLERANCE), HEART, ACCELERATION,
ELECTROCARDIOGRAPHY, SPACE MEDICINE (U)

FORTY-TWO PILOTS WERE EXPOSED TO +GX AND +GZ ACCELERATION IN A VARIETY OF PROFILES AND THE INCIDENCE OF ARRHYTHMIAS INVESTIGATED. +GZ ACCELERATION DID NOT INCREASE THE INCIDENCE OF ARRHYTHMIAS. +GX ACCELERATION INCREASED THE INCIDENCE OF ARRHYTHMIAS AND THIS INCREASE SEEMED RELATED TO BOTH THE DEGREE AND DURATION OF ACCELERATION. PREMATURE CONTRACTIONS, WITH AND WITHOUT ABERRANT CONDUCTION, FROM BOTH THE ATRIA AND VENTRICLES WERE NOTED. ONE SUBJECT HAD PAROXYSMAL AURICULAR TACHYCARDIA WITH +GX ACCELERATION. POSSIBLE CAUSAL MECHANISMS ARE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-644 003 6/12 6/19
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
A TORQUE MOTOR SERVOROTATOR FOR VESTIBULAR APPLICATION. (U)
DESCRIPTIVE NOTE: JOINT REPT.,
SEP 66 20P HIXSON,W. CARROLL ;
NIVEN,JORMA I. ;
REPT. NO. NAMI-979
MONITOR: NAVMED MR005.04-0021.137

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT PREPARED JOINTLY WITH NASA, NASA-ORDER-R-93.

DESCRIPTORS: (*VESTIBULAR APPARATUS, ACCELERATION TOLERANCE), (*ACCELERATION TOLERANCE, TEST EQUIPMENT), SERVOMECHANISMS, SERVOMOTORS, ACCELERATION, NYSTAGMUS, ROTATION, RESPONSES, SPACE MEDICINE (U)

THE PERIODIC ANGULAR ROTATOR IS A NOVEL SERVOROTATOR DESIGNED FOR STUDIES OF THE DYNAMIC RESPONSE OF THE OCULOVESTIBULAR SYSTEM. IT WILL ROTATE A SINGLE SUBJECT ABOUT AN EARTH-VERTICAL AXIS IN A WIDE VARIETY OF STIMULUS WAVEFORMS. STEP FUNCTION, RAMP, AND SINUSOIDAL ANGULAR MOTIONS ARE GENERATED PRECISELY BY A CLOSED-LOOP POWER SERVOMECHANISM DRIVE SYSTEM. THE USE OF A LOW SPEED DC TORQUE MOTOR COUPLED DIRECTLY TO THE PAYLOAD RESULTED IN A SYSTEM WITH LOW ACOUSTIC NOISE AND MECHANICAL VIBRATION PROPERTIES, FAST DYNAMIC RESPONSE CHARACTERISTICS, AND A HIGH DEGREE OF COUPLING STIFFNESS. WHEN OPERATED IN A VELOCITY MODE OF CONTROL, THE DEVICE IS RATED TO PRODUCE A MAXIMUM ANGULAR VELOCITY OF 100 RPM EITHER CLOCKWISE OR COUNTERCLOCKWISE AT ANGULAR ACCELERATIONS UP TO 100 DEG/SQ SEC AND SINUSOIDAL OSCILLATION FREQUENCIES BEYOND 2.0 CPS. WHEN OPERATED IN THE ALTERNATIVE DISPLACEMENT MODE, SIMILAR RATINGS APPLY OVER A PLUS OR MINUS 150 DEGREE EXCURSION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 200529

AD-647 311 14/2 6/19
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
THE CORIOLIS ACCELERATION PLATFORM. A UNIQUE VESTIBULAR RESEARCH DEVICE. (U)
OCT 66 36P HIXSON,W. CARROLL ;
ANDERSON,JOHN J. ;
REPT. NO. NAMI-980
MONITOR: NAVMED MR005.04.0021-138

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH NASA, ORDER NO. R-93.

DESCRIPTORS: (*ACCELERATION TOLERANCE, *TEST FACILITIES), (*VESTIBULAR APPARATUS, ACCELERATION TOLERANCE), ROTATION, LINEAR ACCELERATORS, SIMULATION, SPACE MEDICINE (U)

THE REPORT PRESENTS A BRIEF DESCRIPTION OF THE CORIOLIS ACCELERATION PLATFORM, A NEW COMBINED LINEAR AND ANGULAR MOTION-PRODUCING VESTIBULAR RESEARCH DEVICE DEVELOPED TO STUDY THE BIOLOGICAL EFFECTS OF AEROSPACE ACCELERATION ENVIRONMENTS. THE PRIMARY ELEMENT OF THE DEVICE IS A 20-FT DIAMETER CAPSULE EQUIPPED WITH VARIOUS LIFE-SUPPORT EQUIPMENTS TO STUDY THE LONG-TERM EFFECTS OF CONTINUOUS ROTATION. A LOW RPM, DIRECT-COUPLED, DC TORQUE MOTOR OPERATED IN A CLOSED-LOOP, VELOCITY MODE, POWER SERVOMECHANISM CONFIGURATION ROTATES THE DEVICE IN EITHER DIRECTION AT ANGULAR VELOCITIES EXTENDING TO 200 DEG/SEC AT ACCELERATIONS RANGING TO 18 DEG/SQ SEC. A SECOND DRIVE SYSTEM CAN BE PROGRAMMED TO PRODUCE TIME-VARYING RECTILINEAR TRANSLATIONS OF A SINGLE SUBJECT ALONG A TRACK STRUCTURE FIXED TO THE CAPSULE WHERE THIS FORM OF MOTION CAN OCCUR SINGLY, OR IN COMBINATION WITH ROTATION OF THE ENTIRE DEVICE. PEAK RATINGS OF THE LINEAR DRIVE SYSTEM INCLUDE A RADIAL DISPLACEMENT OF PLUS OR MINUS 20 FT, A LINEAR VELOCITY OF PLUS OR MINUS 16 FT/SEC, AND A LINEAR ACCELERATION OF 96 FT/SQ SEC (3 G). (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-649 545 6/19 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY
INTERACTING VESTIBULAR STIMULI AND NYSTAGMIC HABITUATION, (U)
FEB 66 16P BROWN,JAMES H. ;
PROJ: OA-3A025601A819
MONITOR: USAMRL 715

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN ACTA OTO-LARYNG V62 P341-50.

DESCRIPTORS: (*VESTIBULAR APPARATUS, *ACCELERATION TOLERANCE), (*NYSTAGMUS, HABITUATION LEARNING), RESPONSES, STIMULATION, ANALYSIS OF VARIANCE, SEMICIRCULAR CANALS, PSYCHOPHYSIOLOGY (U)

FIFTEEN NORMAL MALE SUBJECTS WERE REPEATEDLY EXPOSED TO INTERACTING ANGULAR ACCELERATIONS (A POSITIVE ACCELERATION IMMEDIATELY FOLLOWED BY A NEGATIVE ACCELERATION OF EQUAL INTENSITY AND DURATION). PRE- AND POST-TEST TRIALS, CONSISTING OF STANDARD SINGLE ANGULAR ACCELERATIONS, PERMITTED EVALUATION OF THE NECESSITY FOR HABITUATION OF REST INTERVALS BETWEEN SUCCESSIVELY PRESENTED STIMULI. SINCE SIGNIFICANT RESPONSE DECREMENTS WERE EVIDENT IN BOTH THE POST-TEST RESPONSES AND RESPONSES TO THE INTERACTING STIMULI, IT WAS CONCLUDED THAT NYSTAGMIC HABITUATION MAY OCCUR WITHOUT NYSTAGMUS RUNNING TO NORMAL COMPLETION. (AUTHOR) (U)

UNCLASSIFIED

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-649 615 6/19 5/10
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA
ADAPTATION TO VESTIBULAR DISORIENTATION. III.
INFLUENCE ON ADAPTATION OF INTERRUPTING NYSTAGMIC EYE
MOVEMENTS WITH OPPOSING STIMULI. (U)
SEP 66 12P COLLINS,W. E. ;
MONITOR: FAA-AM 66-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-621 439.

DESCRIPTORS: (*NYSTAGMUS, HABITUATION
LEARNING), (*VESTIBULAR APPARATUS,
ADAPTATION(PHYSIOLOGY)), (*ACCELERATION
TOLERANCE, NYSTAGMUS), STIMULATION, RESPONSES,
ELECTROPHYSIOLOGY (U)
IDENTIFIERS: ELECTRONYSTAGMOGRAPHY (U)

FAILURE OF ADAPTATION OF NYSTAGMIC EYE MOVEMENTS TO
OCCUR UNDER CERTAIN CONDITIONS OF STIMULATION BY
ANGULAR ACCELERATION HAS BEEN ASCRIBED TO A FAILURE
TO ALLOW THE EYE-MOVEMENT RESPONSE TO RUN ITS COURSE.
IN THIS STUDY, 3 GROUPS OF SUBJECTS WERE TESTED
UNDER CONDITIONS OF REPEATED ANGULAR ACCELERATIONS IN
WHICH GROUP A RECEIVED UNIDIRECTIONAL
STIMULATION, GROUP B RECEIVED BIDIRECTIONAL
STIMULATION WITH BOTH RESPONSES ALLOWED TO RUN THEIR
COURSE, AND GROUP C RECEIVED BIDIRECTIONAL
STIMULATION BUT THE RESPONSE IN ONE DIRECTION WAS
INTERRUPTED. ADAPTATION OCCURRED FOR ALL GROUPS IN
SPITE OF THE DIFFERENT TEST PROCEDURES. OTHER
IMPLICATIONS OF THE RESULTS ARE DISCUSSED.
(AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-650 331 6/12
MAX-PLANCK-INSTITUT FUER VERHALTENSPHYSIOLOGIE SEEWIESEN (WEST GERMANY)
AN INEXPENSIVE VARIABLE-RAOIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS, (U)
JUN 66 8P HOWLAND,H. C. ;HOWLAND,B. ;STROBELE,R. ;JAHDE,J. ;
CONTRACT: AF-EOAR-44-64
PROJ: AF-9777
TASK: 977701
MONITOR: AFOSR 67-0871

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF APPLIED PHYSIOLOGY V21 N6 P1938-42 NOV 1966.

OESCRIPTORS: (*MEDICAL EQUIPMENT, *CENTRIFUGES), SPACE MEOICINE, ACCELERATION TOLERANCE, TEST EQUIPMENT, LABORATORY EQUIPMENT, INSTRUMENTATION, COSTS, STRESS(PHYSIOLOGY), GRAVITY(ARTIFICIAL) (U)

THE CONSTRUCTION OF AN INEXPENSIVE (LESS THAN $8,000) VARIABLE-RAOIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS IS OESCRIBED AND ITS CAPABILITIES AS A TOOL FOR RESEARCH ARE GIVEN. THE MAXIMUM RAOIUS OF THE CENTRIFUGE IS 4.3 M. IT IS CAPABLE OF ACCELERATING A 300-KG PAYLOAO TO APPROXIMATELY 10 G AT ANY RADIUS BETWEEN 1.5 ANO 4.3 M. THE CENTRIFUGE IS MOBILE, RIOING ON THREE WHEELS, AND ITS WINGS ARE REMOVABLE. IN OPERATION IT RESTS ON THREE SPINOLES, ONE OF WHICH MAY BE EXTENOED TO TIP THE CENTRIFUGE ANO PERMIT STATIONARY COUTERBALANCING OF THE PAYLOAD. BALANCE OF THE STATIONARY OR MOVING CENTRIFUGE MAY ALSO BE MONITOREO VIA ELECTRONIC STRAIN GAGES MOUNTED WITHIN ITS CENTRAL STATIONARY AXLE. NINE SLIP RINGS CARRY POWER TO THE MOVING FRAME ANO PROVIOE IT WITH FOUR LOW-VOLTAGE SIGNAL CHANNELS AND A TELEVISION CHANNEL. (AUTHOR) (U)

UNCLASSIFIED

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-650 481 6/12 6/19
ADMIRAL CORP CHICAGO ILL
X-RAY MOTION MONITOR: LOW-OOSAGE, WIOE-VARIABLE-FIELO TELEVISION RAOIOGRAPH FOR BIOOYNAMIC ANALYSIS.(U)
OESCRIPTIVE NOTE: FINAL REPT., MAY 64-OEC 65,
OEC 66 44P LEYSETH,WILLIAM JEOMUND,B. ,
JR;
REPT. NO. A-12300
CONTRACT: AF 33(615)-1878
PROJ: AF-7231
TASK: 723101
MONITOR: AMRL TR-66-104

UNCLASSIFIEO REPORT

OESCRIPTORS: (•ACCELERATION TOLERANCE, •RAOIOGRAPHY), CLOSED CIRCUIT TELEVISION, X-RAY PHOTOGRAPHY, MEOICAL EXAMINATION, MOTION, MONITORS, BOOY, RAOIOLOGICAL OOSAGE, TELEVISION EQUIPMENT, FLUORESCENT SCREENS, RECORDING SYSTEMS, SPACE MEDICINE (U)

THE X-RAY MOTION MONITOR PROVIOES A NEW ANO VERSATILE TOOL FOR EXPERIMENT ANO RESEARCH WORK IN THE FIELO OF BIOOYNAMICS. THE EQUIPMENT ESSENTIALLY CONSISTS OF A PULSEO X-RAY SOURCE SYNCHRONIZEO WITH A CLOSEO CIRCUIT TV SYSTEM, UTILIZING A FLUORESCENT INTENSIFYING SCREEN TO CONVERT THE X-RAYS INTO A VISIBLE PATTERN. THE 'HEAO' PORTIONS OF THE EQUIPMENT ARE DESIGNEO TO WITHSTAND ACCELERATION UP TO 147 METERS/SQ SEC WHILE RIGIOLY MOUNTEO TO A TEST PLATFORM, AND UP TO 392 METERS/SQ SEC ON SPECIAL SHOCK FIXTURES OESIGNEO FOR OROP TESTS. THE LIGHT OUTPUT OF THE FLUORESCENT SCREEN IS MATCHEO WITH THE SPECTRAL RESPONSE OF THE IMAGE ORTHICON TUBE IN THE TV CAMERA TO PROVIOE PEAK PERFORMANCE WHILE EMPLOYING EXTREMELY LOW X-RAY OOSAGES. THE X-RAY SOURCE IS PULSEO ON FOR ONLY 1/16 OF THE TOTAL OBSERVATION TIME (1 MILLISECONO FOR EVERY 16.7 MILLISECONDS). THE SYSTEM PERMITS VISUAL OBSERVATION, ANO/OR CINE OR VIOEO TAPE RECORDING, OF AN X-RAY VIEW UP TO A SIZE OF 20 BY 20 INCHES OF THE INTERNAL ORGANS OF A LIVE TEST SUBJECT WHILE UNOER ACCELERATION OR SHOCK. IN AOOITION, SPECIAL VIOEO PROCESSORS IN THE SYSTEM PROVIOE VOLTAGE ANALOG OUTPUTS CORRESPONOING TO THE MOVEMENTS OF SELECTED INTERNAL TARGETS IN RELATION TO SOME FIXEO INTERNAL OR EXTERNAL REFERENCE POINTS. THESE ANALOG SIGNALS CAN BE RECORDEO BY GRAPHIC RECORDING OEVICES FOR REFERENCE ANO LATER ANALYSIS.
(AUTHOR) (U)

UNCLASSIFIED

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OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AD-691 067 6/19 6/3
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
CENTRIFUGATION OF THE WHITE-FRONTED CAPUCHIN MONKEY, CEBUS ALBIFRONS (HUMBOLDT). (U)
DESCRIPTIVE NOTE: JOINT REPT.,
DEC 66 15P KNEPTON,JAMES C. , JR;
REPT. NO. NAMI-997
MONITOR: NAVMED MR005.04-0032-3

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, *MONKEYS), SPACE MEDICINE, ELECTROCARDIOGRAPHY, BODY TEMPERATURE, RESPIRATION, CENTRIFUGES (U)

IN PREPARATION FOR BIOLOGICAL EXPERIMENTS ABOARD ORBITING LABORATORIES THREE CEBUS ALBIFRONS, WHITE-FRONTED CAPUCHIN MONKEY, WERE EXPOSED TO FIVE HEADWARD-DIRECTED (+AZ) RESULTANT LINEAR ACCELERATION STIMULI ABOARD A CENTRIFUGE AND THEIR ECG'S, SKIN TEMPERATURES, AND BREATHING RATES RECORDED. MARKED TACHYCARDIA WAS NOTED AT THE START OF THE CENTRIFUGATION, FOLLOWED BY BRADYCARDIA WITHIN 6 TO 7 MINUTES AT 7.5 G AND WITHIN 1 1/2 MINUTES AT 10.3 G. CONCOMITANT WITH THE ONSET OF BRADYCARDIA, A LOUD SQUEAL WAS USUALLY HEARD. THERE WERE NO SIGNIFICENT TEMPERATURE CHANGES, AND BREATHING RATES DID NOT VARY FROM NORMAL. NORMAL HEART RATE WAS RESTORED UPON CESSATION OF CENTRIFUGATION. IT APPEARS THAT THE CEBUS CAN WITHSTAND THE ACCELERATION OF SPACE TRAVEL AND THEREFORE WILL BE A GOOD EXPERIMENTAL ANIMAL IN THAT ENVIRONMENT. (AUTHOR) (U)

UNCLASSIFIED

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-655 436 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AEROSPACE MEDICAL RESEARCH DEPT
HUMAN ACCELERATION EXPERIENCE AT THE U.S. NAVAL AIR DEVELOPMENT CENTER-JOHNSVILLE: 1 JANUARY 1961-30 DECEMBER 1965. (U)
DESCRIPTIVE NOTE: PHASE REPT.,
MAY 67 18P YORK,ELIHU !OLEYNIK,R. J. !PATTON,R. M. !
REPT. NO. NAOC-MR-6711
MONITOR: NAVMED MF022.01.03-7001-12

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, EXPERIMENTAL DATA), STRESS(PHYSIOLOGY), BLACKOUT(PHYSIOLOGY), ARRHYTHMIA, MOTION SICKNESS, CENTRIFUGES, SIMULATION, PATHOLOGY, RESPIRATION, ELECTROCARDIOGRAPHY, AVIATION MEDICINE, SPACE MEDICINE (U)
IDENTIFIERS: GREYOUT (U)

A FIVE YEAR RETROSPECTIVE SURVEY WAS UNDERTAKEN IN ORDER TO LEARN THE CONSEQUENCES OF ACCELERATION EXPOSURE ON HUMAN SUBJECTS. UTILIZING A PUNCHED-CARD DATA SYSTEM, 5071 HUMAN SUBJECT RUNS INVOLVING 380 INDIVIDUALS WERE ANALYZED. SYMPTOMATOLOGY OCCURRED IN 75% OF GZ RUNS AND 52% OF GX RUNS. DURING 2380 +GZ RUNS GREYOUT WAS NOTED 351 TIMES AND BLACKOUT 167 TIMES! DURING 2557 +GX RUNS, CHEST PAIN OCCURRED 104 TIMES, MOTION SICKNESS 97 TIMES, CARDIAC ARRYTHMIA AND DYSPNEA 29 TIMES EACH. MISCELLANEOUS COMPLAINTS DURING ACCELERATION INCLUDED MYALGIA, HEADACHE AND ABDOMINAL PAIN. NO DISABLING SEQUELAE WERE NOTED IN ANY SUBJECT. A MEDICAL MONITORING SYSTEM COMPRISED OF VOICE COMMUNICATION, TELEVISION OBSERVATION, AND ELECTROCARDIOGRAPHIC RECORDING FROM THE SUBJECT PROVED TO BE A SAFE SYSTEM FOR RECORDING MINIMAL RESPONSES. AS MAN IS EXPOSED TO MORE HAZARDOUS ENVIRONMENTS OF HIGH-PERFORMANCE JET AIRCRAFT OR SPACE CAPSULES, MORE DETAILED INFORMATION INVOLVING FURTHER EXPERIMENTATION WITH THE HUMAN CENTRIFUGE MAY BE REQUIRED, EMPLOYING COMPLEX MONITORING SYSTEMS, IN ORDER TO GAIN ADEQUATE KNOWLEDGE OF MAN'S TOLERANCE TO ACCELERATION, AN IMPORTANT VARIABLE AFFECTING MANNED FLIGHT. !AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-657 417 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
EFFECT OF -7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS, (U)
67 8P BRICKER,LEE A. ; JOHNSON,WAYNE A. ;DAVIES,CHESLEY R. ; DOTTORE,ROBERT A. ;
REPT. NO. SAM-TR-66-291
TASK: 793003

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V38 N1 P35-8 JAN 1967.

DESCRIPTORS: (*ACCELERATION TOLERANCE, URINARY SYSTEM), URINE, EXCRETION, SODIUM, POTASSIUM, BLOOD, ERYTHROCYTES (U)

THE EFFECTS OF ONE HOUR OF UNINTERRUPTED -7GX ACCELERATION ON RATE OF URINE FLOW AND URINARY EXCRETION OF SODIUM, POTASSIUM, AND TOTAL SOLUTE WERE STUDIED IN RABBITS. URINE FLOW RATE DURING EXPOSURE TO ACCELERATION FELL TO AN AVERAGE OF 56 PER CENT OF CONTROL VALUES; URINARY EXCRETION OF SODIUM FELL CONCURRENTLY TO 45 PER CENT OF CONTROL, AND POTASSIUM TO 67 PER CENT. THERE WAS NO SIGNIFICANT CHANGE IN TOTAL SOLUTE EXCRETION. THE DECLINES OBSERVED WERE ABRUPT, AS WERE THE RETURNS TO CONTROL LEVELS AFTER ACCELERATION. THE DATA SUGGEST THAT HEMODYNAMIC RATHER THAN HORMONAL INFLUENCES WERE PRIMARILY RESPONSIBLE FOR THESE CHANGES. GROSS OR MICROSCOPIC HEMATURIA OBSERVED IN THE SEDIMENTS OF MOST ACCELERATION URINE SPECIMENS DISAPPEARED OR ABATED DURING THE RECOVERY PHASE. OCCASIONAL RED CELL CASTS INDICATED THAT THE HEMATURIA WAS DUE, AT LEAST IN PART, TO AN INTRARENAL LESION.
(AUTHOR) (U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-660 287 6/19 5/10
ARMY MEDICAL RESEARCH LAB FORT KNOX KY
VISUAL-VESTIBULAR INTERACTION AND THRESHOLD FOR ANGULAR ACCELERATION. (U)
DESCRIPTIVE NOTE: FINAL REPT.,
OCT 67 12P MARSHALL,JOHN E. ;
REPT. NO. USAMRL-754
PROJ: DA-3A025601A819

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, *VISION), VESTIBULAR APPARATUS, THRESHOLDS(PHYSIOLOGY), ILLUMINATION, SENSITIVITY, PSYCHOPHYSIOLOGY, STIMULATION (U)

SUBJECTIVE RESPONSE LATENCIES FROM 36 SS WERE USED AS AN INDEX OF THRESHOLD ACROSS FOUR INTENSITIES OF ANGULAR ACCELERATION (1.5, 3, 6, AND 12 DEGREES/SEC SQ.) UNDER THREE DIFFERENT VISUAL CONDITIONS. THESE INCLUDED TOTAL DARKNESS (D), A SIMPLE, STRUCTURED VISUAL ENVIRONMENT WHICH ROTATED WITH S(LA), AND A HOMOGENEOUS, ILLUMINATED VISUAL FIELD (L). THE RESULTS INDICATE THAT WHILE ILLUMINATION OF THE STRUCTURED VISUAL FIELD LOWERS SUBJECTIVE THRESHOLD FOR ANGULAR ACCELERATION, ITS DIFFERENTIAL EFFECT IS REDUCED WITH INCREASED ACCELERATION INTENSITIES. VISUAL FIELD ARTICULATION ENHANCES THRESHOLD SENSITIVITY WHEN COMPARED WITH DARKNESS, BUT NOT WHEN L X LA COMPARISONS ARE MADE. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-663 053 6/19 6/18
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS AT 760 MM OF MERCURY, (U)
MAY 67 11P CASEY,HAROLO W. ;
CORDY,ODNALD ;GOLDMAN,MARVIN ;SMITH,ARTHUR H.
;
REPT. NO. SAM-TR-66-347

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN AEROSPACE MEDICINE V38 N5 P451-7 MAY 1967.

DESCRIPTORS: (*ACCELERATION TOLERANCE, *WHOLE BODY IRRADIATION), RATS, ADAPTATION(PHYSIOLOGY), HISTOLOGY, LIPIDS, MORTALITY RATES, ACCELERATION, PATHOLOGY, BODY WEIGHT (U)

STUDIES OF THE COMBINED EFFECTS OF CHRONIC ACCELERATION AND ACUTE 6060 WHOLEBODY IRRADIATION WERE PERFORMED ON RATS. RATS EXPOSED TO ACCELERATIVE FORCES (2.0 TO 3.0G), PRODUCED BY CONTINUOUS CENTRIFUGATION, WERE OBSERVED FOR PERIODS UP TO FOUR MONTHS. DELETERIOUS EFFECTS WERE NOT PRODUCED BY ACCELERATION PER SE, AS PHYSIOLOGIC ADAPTATION WAS EVIDENT BY THE SEVENTH TO FOURTEENTH DAY. ON GROSS AND HISTOLOGIC EXAMINATIONS A DEPLETION OF BODY FAT DEPOSITS AND A REDUCTION IN BODY MASS WERE THE ONLY DETECTABLE DIFFERENCES IN ACCELERATED RATS WHEN COMPARED WITH CONTROL RATS. CONTINUOUS ACCELERATION, IMMEDIATELY FOLLOWING IRRADIATION, INCREASED RADIATION MORTALITY AND THE MORTALITY INCREASED PROGRESSIVELY WITH INCREASES IN THE ACCELERATIVE FORCE. PRIOR ADAPTATION OF RATS TO ACCELERATION HAD NO INFLUENCE ON THE INCREASED MORTALITY. DECELERATION TO NORMAL GRAVITY FOLLOWED BY IRRADIATION HAD NO EFFECT ON MORTALITY. IN ACCELERATED-IRRADIATED RATS THAT DIED, THE LESIONS FOUND BY GROSS AND HISTOLOGIC EXAMINATIONS WERE TYPICAL OF THOSE PRODUCED BY RADIATION. ACCELERATED RATS, SACRIFICED 30 DAYS FOLLOWING IRRADIATION, HAD LESIONS COMPARABLE TO NON-ACCELERATED IRRADIATED RATS INDICATING THAT THE PATHOLOGIC CHANGES PRODUCED BY IRRADIATION WERE NOT ALTERED BY ACCELERATION. THE RESULTS SHOW THAT THE BIOLOGIC RESPONSE TO WHOLE-BODY IRRADIATION IS ALTERED BY CHANGING THE WEIGHT TO MASS RATIO WITH ACCELERATIVE FORCES ABOVE NORMAL GRAVITY. THE EXACT CAUSE OF THE INCREASED MORTALITY WAS NOT DETERMINED. THESE FINDINGS SUGGEST ADDITIONAL (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-663 197 6/18 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT, (U)
67 20P ANTIPOV,V. V. ;DAVYDOV,B. I. ;PANCHENKOVA,E. F. ;SAKSONOV,P. P. ;
REPT. NO. SAM-TT-R-941-1267

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF CONGRESS OF THE INTERNATIONAL ASTRONAUTICAL FEDERATION (18TH), BELGRAD, 25-30 SEP 67. PAPERS, NP., NO.

DESCRIPTORS: (*RADIATION EFFECTS, *ACCELERATION TOLERANCE), RADIATION TOLERANCE, ASTRONAUTS, SPACE FLIGHT, RADIOLOGICAL DOSAGE, MORTALITY RATES, MATHEMATICAL ANALYSIS, MICE, USSR (U)

MATERIAL IS REVEALED REPRESENTING FURTHER DEVELOPMENT IN THE RESEARCH INTO THE RESPONSIVENESS OF AN IRRADIATED ORGANISM TO VARIOUS SPACEFLIGHT FACTORS. IN PARTICULAR, AN ATTEMPT WAS MADE TO EVALUATE THE ROLE OF PROCESSES ARISING WITHIN THE IRRADIATED ORGANISM AS IT RESPONDS TO 'CHRONIC' G-LOADING. PRINCIPLES CONCERNING THE FEASIBILITY OF EXTRAPOLATING OUR EXPERIMENTAL RESULTS TO MAN ARE OUTLINED AS WELL AS THE MANNER IN WHICH ORIENTATIONAL DATA WAS COLLECTED ON THE MAXIMUM POSSIBLE EXPOSURE (MPE) AS EVALUATED IN THE LIGHT OF CRITERIA FOR ACCELERATION TOLERANCE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-664 211 6/12 6/19
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
A COUNTERROTATOR FOR HUMAN CENTRIFUGE
APPLICATION, (U)
OCT 67 17P HIX,W. CARROLL ;
ANDERSON,JOHN J. ;
REPT. NO. NAMI-1020
CONTRACT: NASA ORDER-R-93
PROJ: MR005.04-0021.152

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLIGHT SIMULATORS, DESIGN), (*CENTRIFUGES, HUMANS), SPACE MEDICINE, ROTATION, VESTIBULAR APPARATUS, ACCELERATION, RESPONSES, DRIVES, CONFIGURATION, CONTROL PANELS (U)
IDENTIFIERS: COUNTERROTATORS (U)

A NEW MAN-RATED VESTIBULAR RESEARCH DEVICE, IDENTIFIED AS THE COUNTERROTATOR (CORO), WAS DEVELOPED TO INVESTIGATE MAN'S RESPONSE TO THE DYNAMIC LINEAR ACCELERATION ENVIRONMENT AFFORDED BY COUNTERROTATION ABOARD A CENTRIFUGE. THE DEVICE PROPER IS A SMALL EARTH-VERTICAL ROTATOR WHICH UTILIZES A DC TORQUE MOTOR OPERATED AS A CLOSED-LOOP POSITION SERVO TO TURN A SEATED SUBJECT ABOUT HIS Z HEAD AXIS. WHEN INSTALLED ABOARD THE RADIAL ARM OF THE CORIOLIS ACCELERATION PLATFORM (CAP), A CENTRIFUGE-LIKE ROTATOR, THE CORO DRIVE SYSTEM WILL TRACK THE ANGULAR MOTIONS OF CAP OVER THE 0- TO 100-DEG/SEC VELOCITY RANGE AT ANGULAR ACCELERATIONS EXTENDING TO 15 DEG/SQ SEC. THE DEVICE IS RATED TO ACHIEVE THIS 1:1 COUNTERROTATION CAPABILITY IN LOW-LEVEL, VARIABLE MAGNITUDE, CENTRIPETAL ACCELERATION FIELDS EXTENDING FROM 0 TO 1.75 G NOMINAL. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZDD529

AD-664 553 6/19
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
THE HUMAN SPINAL COLUMN AND UPWARD EJECTION ACCELERATION: AN APPRAISAL OF BIODYNAMIC IMPLICATIONS. (U)
DESCRIPTIVE NOTE: FINAL REPT. JUL 65-JUN 66, SEP 67 61P HENZEL,JOHN H. ;
REPT. NO. AMRL-TR-66-233
PROJ: AF-7231
TASK: 723101

UNCLASSIFIED REPORT

DESCRIPTORS: (•EJECTION, TOLERANCES(PHYSIOLOGY)), (•ACCELERATION TOLERANCE, •SPINAL COLUMN), AVIATION INJURIES, COMPRESSIVE PROPERTIES, LOADING(MECHANICS), WOUNDS + INJURIES, DEFORMATION, PROBABILITY, IMPACT, STRESS(PHYSIOLOGY), FRACTURES(BONE), ANATOMY, ESCAPE SYSTEMS(AEROSPACE), DESIGN (U)

VERTEBRAL COMPRESSION REPRESENTS A SIGNIFICANT PERCENTAGE OF THE MORBIDITY ASSOCIATED WITH UPWARD EJECTION. VERTEBRAL AND INTERVERTEBRAL STRUCTURE REACTS TO AND IS SOMETIMES IRREVERSIBLY ALTERED BY EJECTION ACCELERATION. DESIGN AND MATERIAL PROPERTIES OF THE NORMAL VERTEBRAL COLUMN ARE SUFFICIENTLY CONSTANT THAT WHEN STRUCTURAL CHARACTERISTICS ARE DEFINED AND ACCELERATION PROFILES KNOWN, PREDICTION OF FAILURE MAY BE MADE. COMPRESSIVE LOAD ANALYSES OF VERTEBRA-DISC COMPLEXES DEMONSTRATED THAT THE VERTEBRAL END-PLATES ARE THE INITIALLY FAILING STRUCTURES OF THE SPINAL COLUMN. FROM EXPERIMENTAL DATA ON VERTEBRAL BREAKING-LOADS, ACCEPTABLY ACCURATE PROBABILITY-OF-INJURY CURVES FOR STATIC LOADING WERE GENERATED. THESE DATA TOGETHER WITH DATA DESCRIBING THE DYNAMIC RESPONSE CHARACTERISTICS OF THE HUMAN BODY PERMIT CALCULATION OF THE PROBABILITY-OF-INJURY FOR DYNAMIC LOADING PRODUCED BY EXPOSURE TO IMPACT ACCELERATIONS. AS AN AID TO THE DESIGNER OF EJECTION SYSTEMS, APPLICATION OF THESE CONCEPTS SHOULD REFINE THE ESTIMATE OF 'SAFE' ACCELERATION PROFILES AND MINIMIZE THE RISK OF IRREVERSIBLE VERTEBRAL DEFORMATION. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AO-665 413 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES, (U)
SEP 67 14P DOWD,PATRICK J. ;
WING,MORGAN E. ;CRAMER,ROBERT L. ;
COLLINS,FREDERICK G. ;
REPT. NO. SAM-TR-67-93
PROJ: AF-7750
TASK: 775003

UNCLASSIFIED REPORT

DESCRIPTORS: (•ACCELERATION TOLERANCE, •VESTIBULAR APPARATUS), RESPONSES, NYSTAGMUS, STIMULATION, CENTRIFUGES, PILOTS, CENTRAL NERVOUS SYSTEM, STRESS(PHYSIOLOGY), SPACE MEDICINE (U)
IDENTIFIERS: CORIOLIS STIMULATION, CALORIC STIMULATION (U)

PRELIMINARY INVESTIGATIONS INTO THE EFFECTS OF HIGH LINEAR ACCELERATIONS ON THE VESTIBULO-OCULAR RESPONSES TO BOTH CALORIC AND CORIOLIS STIMULATIONS WERE MADE. PILOTS WERE SUBJECTED TO SHORT-DURATION ACCELERATIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE CENTRIFUGE. A SPONTANEOUS SLOW-PHASE DOWNWARD NYSTAGMUS WAS OBSERVED IN SOME PILOTS IN POST-CENTRIFUGE TESTS. SOME PERIPHERAL AND CENTRAL-NEURAL MODIFICATION RESULTING FROM CENTRIFUGATION WAS OBSERVED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00529

AD-665 849 6/19 6/5
SYSTEMS RESEARCH LABS INC SAN ANTONIO TEX
RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES. (U)
DESCRIPTIVE NOTE: REPT. FOR JAN-DEC 66, SEP 67 99P ROTHE,W. E. ;POPE,EDWARD E. ;LIM,SAMUEL T. ;FLETCHER,JOHN G. ;
CONTRACT: AF 41(609)-2897
PROJ: AF-7930
TASK: 793003
MONITOR: SAM TR-67-69

UNCLASSIFIED REPORT

DESCRIPTORS: (*AVIATION MEDICINE, *ACCELERATION TOLERANCE), (*STRESS(PHYSIOLOGY), ACCELERATION), FLIGHT SIMULATORS, PERFORMANCE(HUMAN), ROTATION, INSTRUMENTATION, MONITORS, RESPONSES, TELEMETERING DATA (U)
IDENTIFIERS: BIOSENSORS (U)

PHYSIOLOGIC RESEARCH HAS EXPLORED THE RESPONSES OF HUMANS TO ROTATION AND ACCELERATION. THE TEST VEHICLE WAS THE ROTATIONAL FLIGHT SIMULATOR, AN AIR BEARING SUSPENDED SPHERE WITH UNRESTRICTED ROTATIONAL FREEDOM PROPELLED BY INTERNALLY MOUNTED INERTIA RINGS AND, LATER, BY A SINGLE AXIS EXTERNAL DRIVE ASSEMBLY. ENGINEERING EFFORTS ESTABLISHED THE DYNAMICS AND IMPROVED THE CONTROL OF THE VEHICLE. INSTRUMENTATION WAS PROVIDED FOR THE READOUT, DISPLAY, AND RECORDING OF SIGNIFICANT DATA SERVING FOR PHYSIOLOGIC EVALUATION AND MEDICAL MONITORING. THE DATA WERE TELEMETERED; PICTORIAL DISPLAY OF THE SUBJECT AND TWO-WAY COMMUNICATION LINKS WERE PROVIDED. A TOTAL OF 138 EXPERIMENTS YIELDED VALID PHYSIOLOGIC AND HUMAN PERFORMANCE INFORMATION IN A ROTATIONAL ENVIRONMENT FROM FRACTIONAL TO 16 RPM AND FOR SEVERAL MINUTES TO A MAXIMUM OF 30 MINUTES. THE SUBJECTS CONSISTED OF 7 YOUNG, HEALTHY MALES. RESULTS INDICATED THAT THE RFS PROPERLY USED AND INSTRUMENTED REPRESENTS A VALUABLE AND UNIQUE TEST VEHICLE; THAT CHANGES IN HEART RATE, AND ECG READINGS DEPENDED ON BODY POSITION WITH RESPECT TO GRAVITY; THAT ELECTRO-OCULOGRAM, SUBJECTIVE SENSATIONS, INCIPIENT NAUSEA, AND ABILITY OF THE PILOT TO RIGHT THE STATIONARY SPHERE AFTER TUMBLING-- ALL DEPENDED ON THE RATE, DURATION, AND AXIS PATTERN OF ROTATION. (AUTHOR) (U)

UNCLASSIFIED

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-666 178 6/19 6/16
ARMY MEDICAL RESEARCH LAB FORT KNOX KY
ADAPTATION TO PROLONGED CONSTANT ANGULAR
ACCELERATION. (U)
DESCRIPTIVE NOTE: PROGRESS REPT.,
JAN 68 19P BROWN,JAMES H. ;
WOLFE,JAMES W. ;
REPT. NO. USAMRL-764
PROJ: DA-3A025601A819

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION,
*ADAPTATION(PHYSIOLOGY)), (*VESTIBULAR
APPARATUS, ACCELERATION TOLERANCE), EYE,
REFLEXES, NYSTAGMUS, RESPONSES,
ELECTROPHYSIOLOGY, PSYCHOPHYSICS, SPACE MEDICINE (U)

TWO INDEPENDENT GROUPS OF NORMAL HUMAN SUBJECTS
WERE EXPOSED TO A NUMBER OF LONG-DURATION (UP TO 96
SEC), RELATIVELY HIGH-INTENSITY (3 DEGREES/SEC SQ
- 24 DEGREES/SEC SQ) CONSTANT, ANGULAR
ACCELERATIONS. NYSTAGMIC DECREMENTS DURING
STIMULATION WERE CLEARLY EVIDENT. THE DECREMENTS
WERE INITIATED AT ABOUT THE SAME TIME AFTER STIMULUS
ONSET (30-35 SEC) FOR ALL ACCELERATIONS USED.
THE DECREMENTS IN THE NYSTAGMIC RESPONSES WERE
COMPARED TO RELATED FINDINGS FOR BOTH SUBJECTIVE AND
ELECTROPHYSIOLOGICAL RESPONSES. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZDD929

AD-666 379 6/19 14/2
NAVAL AEROSPACE MEDICAL INST PENSACOLA FLA
INSTRUMENTATION FOR THE CORIOLIS ACCELERATION
PLATFORM. (U)
DESCRIPTIVE NOTE: JOINT REPT.,
NOV 67 28P HIXSON,W. CARROLL ;
REPT. NO. NAMI-1022
CONTRACT: NASA DROER-R-93
PROJ: NAVMED-MR009.04-0021
TASK: MR009.04-0021-154

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, TEST EQUIPMENT), SPACE MEDICINE, INSTRUMENTATION, ACCELERATION, VESTIBULAR APPARATUS, TRANSDUCERS, DISPLAY SYSTEMS, DATA PROCESSING SYSTEMS, SLIP RINGS, CONTROL PANELS, CIRCUITS, ACOUSTIC EQUIPMENT (U)
IDENTIFIERS: *BIOINSTRUMENTATION, *CORIOLIS ACCELERATION PLATFORM (U)

THE REPORT DESCRIBES A GENERAL-PURPOSE INSTRUMENTATION SYSTEM DEVELOPED FOR USE IN CONJUNCTION WITH THE CORIOLIS ACCELERATION PLATFORM, A COMBINED LINEAR AND ANGULAR MOTION DEVICE RECENTLY INSTALLED AT THE VESTIBULAR RESEARCH FACILITIES OF THIS ACTIVITY. THE SYSTEM, BASED ON THE USE OF STANDARD COMMERCIALLY AVAILABLE EQUIPMENT, PROVIDES THE BASIC TRANSDUCERS, SIGNAL-CONDITIONING CIRCUITRY, AND RECORDING INSTRUMENTS REQUIRED FOR THE ACQUISITION, DISPLAY, AND STORAGE OF A WIDE VARIETY OF COMMONLY COLLECTED BIOLOGICAL AND BIOENVIRONMENTAL MEASUREMENT DATA. (AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-669 017 6/19
GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF
EFFECTS OF ACCELERATION AND 'G' LOADINGS ON MAN AND ANIMALS 1945-1959; A BIBLIOGRAPHY. (U)
MAY 59 7P PECK,T. P. ;
REPT. NO. GDA-L-59-4-30

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, BIBLIOGRAPHIES), STRESS(PHYSIOLOGY), SPACE MEDICINE, AVIATION MEDICINE, HUMANS, ANIMALS (U)

THE BIBLIOGRAPHY ON THE EFFECTS OF ACCELERATION ON HUMANS AND ANIMALS LISTS REPORTS COMPLETED FROM 1945-1959. THE LIST INCLUDES 58 ARTICLES, 21 PAPERS AND DOCUMENTS, AND 4 BOOKS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. Z00929

AD-670 468 6/19
NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AVIATION MEDICAL ACCELERATION LAB
PILOT PERFORMANCE AND TOLERANCE STUDIES OF ORBITAL RE-ENTRY ACCELERATION. (U)
DESCRIPTIVE NOTE: LETTER REPT.,
SEP 58 9P SHEPLER,HERBERT G. ;
REPT. NO. NADC-MA-8
PROJ: TED ADC AE-1412

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, PILOTS), PERFORMANCE(HUMAN), ATMOSPHERE ENTRY, SPACE MEDICINE, VERTIGO, LIFT, OSCILLATION, ASTRONAUTS (U)

THE REPORT CONCERNS A PRELIMINARY STUDY OF HUMAN TOLERANCE TO THE RE-ENTRY ACCELERATIONS EXPECTED IN ZERO LIFT VEHICLES. THE STUDY WAS UNDERTAKEN TO ASCERTAIN WHETHER A HUMAN SUBJECT COULD TOLERATE ORBITAL RE-ENTRY ACCELERATION PATTERNS ASSOCIATED WITH THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS (NACA) MANNED SPACE CAPSULE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 2005 29

AD-670 823 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
EFFECT OF +GZ AND +GX ACCELERATION ON PERIPHERAL VENOUS ADH LEVELS IN HUMANS, (U)
DEC 67 9P ROGGE,JAMES O. ;MOORE,WARO W. ;SEGAR,WILLIAM E. ;FASOLA,A. F. ;
REPT. NO. SAM-TR-67-286
PROJ: AF-7930
TASK: 973003

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF APPLIED PHYSIOLOGY V23 N6 P870-4 DEC 1967.

DESCRIPTORS: (*ACCELERATION TOLERANCE, PITUITARY HORMONES), (*PITUITARY HORMONES, SECRETION), BLOOD CHEMISTRY, PRESSURE SUITS, URINE, VOLUME, STRESS(PHYSIOLOGY) (U)
IDENTIFIERS: *ANTIDIURETIC HORMONE (U)

THE EFFECT OF +2 GZ AND +2 GX ACCELERATION FOR 30 MIN ON THE PERIPHERAL VENOUS ADH LEVELS IN HUMAN SUBJECTS WAS STUDIED ON THE UNITED STATES AIR FORCE-SAM HUMAN CENTRIFUGE. A MEAN RISE IN THE BLOOD ADH LEVEL OF 2.97 MICRO U/ML (P < 0.05) WAS FOUND DURING THE +GZ RUNS, AND THIS RISE COULD BE INHIBITED BY HAVING THE SUBJECTS WEAR AN ANTI-G SUIT INFLATED TO 60 MM HG. A MEAN DECREASE IN THE BLOOD ADH LEVEL OF 0.89 MICRO U/ML (P < 0.05) WAS FOUND DURING GX ACCELERATION. THESE RESULTS SUPPORT THE ASSUMPTIONS OF PREVIOUS AUTHORS THAT CHANGES IN URINE VOLUME DURING +GZ AND +GX ACCELERATION ARE PROBABLY A RESULT OF CHANGES IN ADH SECRETION. (AUTHOR) (U)

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AD-671 855 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA
ADAPTATION TO VESTIBULAR DISORIENTATION. VI. EYE-MOVEMENT AND SUBJECTIVE TURNING RESPONSES TO VARIED DURATION OF ANGULAR ACCELERATION, (U)
MAY 67 12P GUEDRY,FRED E. ;
COLLINS,WILLIAM E. ;
MONITOR: FAA-AM 67-7

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACCELERATION TOLERANCE, *NYSTAGMUS), VESTIBULAR APPARATUS, ADAPTATION(PHYSIOLOGY), SENSATION(PHYSIOLOGY), RESPONSES, REFLEXES, SENSORY PERCEPTION, AVIATION MEDICINE (U)

TURNING SENSATIONS AND EYE MOVEMENT RESPONSES DURING ANGULAR ACCELERATIONS MAY SHOW ADAPTATION EFFECTS OF SIGNIFICANCE TO UNDERSTANDING VESTIBULAR REACTIONS DURING CERTAIN AIRCRAFT MANEUVERS. IN THIS STUDY, A DIRECT RELATIONSHIP FOUND BETWEEN DURATION OF ACCELERATION AND (A) DECLINE OF RESPONSE DURING ACCELERATION, (B) RATE OF DECLINE OF RESPONSE AFTER ACCELERATION, AND (C) MAGNITUDE OF SECONDARY REACTION, IS REGARDED AS AN INDICATION OF A CENTRAL PROCESS WHICH LIMITS A PROLONGED VESTIBULAR PRIMARY REACTION. THE PROCESS IS MANIFESTED BY ITS INFLUENCE ON RELATIVELY BASIC REFLEX REACTIONS (NYSTAGMUS) IN THE CAT, AND IS MORE PROMINENTLY MANIFESTED IN MAN BY ITS INFLUENCE ON SENSORY PERCEPTION. (AUTHOR) (U)

OOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO529

AO-672 446 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
PERIPHERAL VENOUS RENIN LEVELS OURING +GZ ACCELERATION, (U)
OCT 67 9P ROGGE,JAMES O. ;FASOLA,A. F. ;MARTZ,B. L. ;
REPT. NO. SAM-TR-67-262

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V38 N10 P1024-1028 1967.

DESCRIPTORS: (•PEPTIDE HYDROLASES, SECRETION), (•ACCELERATION TOLERANCE, BLOOD CHEMISTRY), STRESS(PHYSIOLOGY), CARDIOVASCULAR SYSTEM, RESPONSES, PRESSURE SUITS, AUTONOMIC NERVOUS SYSTEM, SPACE MEDICINE (U)
IDENTIFIERS: •RENIN, ANGIOTENSINS (U)

RENIN SECRETION, AS MEASURED BY CHANGES IN PERIPHERAL VENOUS RENIN LEVELS, WAS USED TO EVALUATE THE PART PLAYED BY THE RENINANGIOTENSIN SYSTEM IN THE RESPONSE TO +GZ ACCELERATION. CENTRIFUGE RUNS WERE DONE ON THE USAF SAM HUMAN CENTRIFUGE AND THE SUBJECTS WERE MEMBERS OF THE USAF SAM ACCELERATION/DECELERATION PANEL. A LARGER INCREASE IN THE RENIN LEVEL WAS FOUND EACH TIME THE RUN DURATION WAS INCREASED AT +2GZ. THE MEAN INCREASE IN THE 20 MINUTE SAMPLES WAS 0.36 NG./ML. (P<0.05) AND IN THE 30 MINUTE SAMPLES WAS 0.76 NG./ML. (P<0.01). A MEAN RISE OF 0.63 NG./ML., FOUND AFTER 30 MINUTES AT +2GZ WHILE WEARING AN ANTI-G SUIT, WAS NOT SIGNIFICANTLY DIFFERENT FROM THE RISE FOUND IN THE 30 MINUTE RUNS WITHOUT THE G-SUIT. THE RENIN-ANGIOTENSIN SYSTEM MAY PLAY A PART IN THE RESPONSE TO +GZ ACCELERATION, EITHER ALONE OR IN CONJUNCTION WITH THE AUTONOMIC NERVOUS SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZDD529

AD-672 448 6/19
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
ABDOMINAL BLOOD FLOW CHANGES OURING ACCELERATION STRESS IN ANESTHETIZED DOGS, (U)
FEB 68 9P STONE,H. L. ;ALEXANDER,W. C. ;
REPT. NO. SAM-TR-67-268

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AEROSPACE MEDICINE, V39 N2 P115-119 FEB 68.

DESCRIPTORS: (*ACCELERATION TOLERANCE, *CARDIOVASCULAR SYSTEM), BLOOD CIRCULATION, ABDOMEN, STRESS(PHYSIOLOGY), BLOOD VOLUME, MEASUREMENT, ELECTRODES, PULSE RATE, BLOOD PRESSURE, IMPLANTS, TISSUES(BIOLOGY) (U)

THE CHANGES IN ABDOMINAL BLOOD FLOW DURING ACCELERATION STRESS WERE MEASURED BY A HYDROGEN ELECTRODE TECHNIQUE USED IN NINE ANESTHETIZED DOGS. THE ELECTRODES WERE IMPLANTED IN THE RENAL CORTEX, ADRENAL GLAND, AND THE SMALL INTESTINE. MEASUREMENTS OF TISSUE BLOOD FLOW, HEART RATE, AND MEAN ARTERIAL PRESSURE WERE MADE AT LEVELS OF ACCELERATION UP TO +12GX IN THE SUPINE POSITION. THE POSITION OF THE ANIMAL WAS CHANGED IN 10 DEGREE INCREMENTS TOWARD THE HEAD-UP POSITION WITH 30 DEGREE-HEADUP TILT BEING THE MAXIMUM TILT USED. THE ABOVE MEASUREMENTS WERE REPEATED AT EACH G LEVEL UNTIL NO DISCERNIBLE TISSUE FLOW COULD BE MEASURED. THE TISSUE BLOOD FLOW WAS FOUND TO REMAIN WITHIN NORMAL LIMITS UP TO 6 OR 8 +GX IN THE SUPINE AND 10 DEGREE-HEAD-UP POSITIONS, BUT WAS FOUND TO BE SIGNIFICANTLY REDUCED ABOUT THESE G LEVELS. IN THE 20- AND 30 DEGREE-HEAD-UP POSITIONS A MORE RAPID DECLINE IN TISSUE FLOW OCCURRED. THE CHANGES IN MEAN ARTERIAL PRESSURE AND HEART RATE WERE RECORDED. IN OTHER INVESTIGATIONS THE MAGNITUDE OF THE +GZ VECTOR DURING ACCELERATION STRESS SEEMS TO DETERMINE THE POINT OF DETERIORATION OF CARDIOVASCULAR FUNCTION, BUT AT HIGH +GX ACCELERATIONS, DETERIORATION OF CARDIOVASCULAR FUNCTION WAS ALSO OBSERVED. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. ZOO929

AO-672 927 6/19 14/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)
PRINCIPLES OF BIODYNAMICS: SECTION A. CHAPTER V.
DESCRIPTIVE CATALOG OF AEROSPACE MEDICAL BIODYNAMICS
FACILITIES IN THE UNITED STATES. (U)
68 75P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (•ACCELERATION TOLERANCE, TEST FACILITIES), AVIATION MEDICINE, SPACE MEDICINE, LABORATORY ANIMALS, HUMANS, VIBRATION, ROTATION, CENTRIFUGES, FLIGHT SIMULATORS, VELOCITY, TURBULENCE, ANALOG COMPUTERS, MONITORS, LINEAR SYSTEMS, CATAPULTS, ANTHROPOMETRY, IMPACT SHOCK, DROP TESTING (U)
IDENTIFIERS: •BIODYNAMICS, DISORIENTATION (U)

THE DOCUMENT IS A DESCRIPTIVE CATALOG OF AEROSPACE MEDICAL BIODYNAMICS FACILITIES IN THE UNITED STATES. (U)

•ADMIRAL CORP CHICAGO ILL
• • •
A-12300
X-RAY MOTION MONITOR: LOW-DOSAGE, WIDE-VARIABLE-FIELD TELEVISION RADIOGRAPH FOR BIODYNAMIC ANALYSIS.
(AMRL-TR-66-104)
AD-690 481

•ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)
• • •
PRINCIPLES OF BIODYNAMICS: SECTION A. CHAPTER V. DESCRIPTIVE CATALOG OF AEROSPACE MEDICAL BIODYNAMICS FACILITIES IN THE UNITED STATES.
AD-672 927

•AEROMEDICAL RESEARCH LAB (6571ST) HOLLOMAN AFB N MEX
• • •
6571-ARL-TR-66-8
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EXPERIENCE PARAMETERS AND SUBJECT ACCELERATION RESPONSE IN EXPERIMENTAL IMPACT.
AD-630 788
• • •
ARL TR64 11
DYNAMIC RESPONSE ANALYSIS OF +GX IMPACT ON MAN.
AD-457 349
• • •
TDR62 11
THE PHYSIOLOGICAL RESPONSES OF CHIMPANZEES TO SIMULATED LAUNCH AND RE-ENTRY ACCELERATIONS
AD-282 883
• • •
TR-65-22
MAXIMUM VOLUNTARY VENTILATION AFTER + G SUB X IMPACT IN HUMANS.
AD-624 626

•AERONAUTICAL SYSTEMS DIV WRIGHT-PATTERSON AFB OHIO
• • •
ASD-TR61 497
THE EFFECTS OF TRANSVERSE ACCELERATIONS AND EXPONENTIAL TIME-LAG CONSTANTS ON COMPENSATORY TRACKING PERFORMANCE
AD-268 189
• • •
ASD-TR61 743
DESCRIPTION AND PERFORMANCE EVALUATION OF THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR
AD-287 996
• • •
TR61 743
DESCRIPTION AND PERFORMANCE EVALUATION OF THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR
(ASD-TR61 743)
AD-287 996

•AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
• • •
AMRL-TDR63 106
PHOTOELECTRIC EARPIECE RECORDINGS AND OTHER PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION (+GZ) PRODUCED BY PARTIAL IMMERSION IN WATER.
AD-431 208
• • •
AMRL-TDR64 70
THE EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
AD-603 963
• • •
AMRL-TR-64-132
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+GX) ACCELERATION.
AD-613 331
• • •
AMRL-TR-64-133
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541
• • •
AMRL-TR-64-144
A RESTRAINT SYSTEM FOR APPLICATION IN RSUBZ AND -GSUBX ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS.
AD-612 957
• • •
AMRL-TR-65-7
MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946
• • •
AMRL-TR-65-27
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE

WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AO-620 319

• • •

AMRL TR-65-36
A SUMMARY OF HUMAN TOLERANCE TO PROLONGED ACCELERATION.
AO-615 570

• • •

AMRL-TR-65-50
THE MOTION OF THE HUMAN CENTER OF MASS AND ITS RELATIONSHIP TO THE MECHANICAL IMPEDANCE.
AO-637 182

• • •

AMRL-TR-65-56
CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS,
AO-634 080

• • •

AMRL-TR-65-57
HUMAN TOLERANCE TO GZ 100 PER CENT GRADIENT SPIN.
AO-635 719

• • •

AMRL-TR-65-68
EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AO-638 719

• • •

AMRL-TR-65-109
A REVIEW OF RESTRAINT SYSTEMS TEST METHODS.
AO-618 280

• • •

AMRL-TR-65-127
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS.
AO-624 487

• • •

AMRL-TR-65-134
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AO-622 026

• • •

AMRL-TR-66-84
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.
AO-638 792

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AO-650 331

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• • •

901
REPORTS ON HUMAN ACCELERATION
AO-266 077

• • •

903
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT). A DESCRIPTION OF FACILITIES IN USE AND PROPOSED
AO-266 078

• • •

913
HUMAN ACCELERATION STUDIES
AD-266 076

• • •

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ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE
AD-262 435

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• • •

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(FAA-AM-67-7)
AO-671 855

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TASK - CONTROL OF AROUSAL AND THE EFFECTS OF REPEATED UNIDIRECTIONAL ANGULAR ACCELERATION ON HUMAN VESTIBULAR RESPONSES.
AO-603 419

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AO-269 691

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AO-618 290

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(AMRL-TDR63 106)
AD-431 208

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(AMRL-TR-64-132)
AD-613 331

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AD-424 922

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CANALS.
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AD-617 752

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AD-620 273

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HIGH ACCELERATIONS IN INTERMEDIATE TRAINING: INCIDENCE OF SYMPTOMS AND AN ESTIMATE OF TOLERANCE TO 'G'.
AD-620 298

• • •

61

THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT
AD-268 793

• • •

62

SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE
AD-268 791

• • •

NSAM-RR-94

USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT.
AD-602 210

•SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX

• • •

RESPONSE OF MAMMALIAN GRAVITY RECEPTORS TO SUSTAINED TILT
AD-272 332

• • •

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CARDIAC ARRHYTHMIAS OCCURRING DURING ACCELERATION.
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AD-663 053

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AD-665 849

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EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES.
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AD-672 448

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AD-670 823

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AD-663 197

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AD-637 182

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AD-268 188

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AD-255 298
SOME NOTES ON THE PHYSIOLOGICAL TOLERANCE TO ACCELERATION•
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AD-260 549
REPORTS ON HUMAN ACCELERATION•
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THE EFFECTS OF TRANSVERSE ACCELERATIONS AND EXPONENTIAL TIME-LAG CONSTANTS ON COMPENSATORY TRACKING PERFORMANCE•
AD-268 185
SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE•
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EXPOSURE OF FIVE MALE CHIMPANZEES TO SIMULATED SPACE FLIGHT CONDITIONS OF LAUNCH ACCELERATION AND ATMOSPHERIC RE-ENTRY DECELERATION. PHYSIOLOGICAL RESPONSES SERVE AS A BASELINE FOR THE STUDY OF THE EFFECTS OF WEIGHTLESSNESS.
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AD-438 485

EXPERIMENTAL DATA
HUMAN ACCELERATION EXPERIENCE AT THE U.S. NAVAL AIR DEVELOPMENT CENTER-JOHNSVILLE: 1 JANUARY 1961-30 DECEMBER 1965.●
AD-655 436

HEART
CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF 9GX AND 10GX.
AD-625 254

HUMAN ENGINEERING
REPRINT: MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.●
AD-638 792

HUMANS
SUMMARY OF HUMAN TOLERANCE TO PROLONGED ACCELERATION.
AD-615 570
AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EXPERIENCE PARAMETERS AND SUBJECT ACCELERATION RESPONSE IN EXPERIMENTAL IMPACT.
AD-630 788

LABORATORY EQUIPMENT
STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546

LUNGS

DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (GX) ACCELERATION.
AD-633 473

MAN
TRANSLATION OF FOREIGN RESEARCH ON THE PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM DURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME AND INTENSITY, DIRECTED ALONG THE SPINEBREAST AXIS.
AD-426 900

MATHEMATICAL MODELS
HUMAN BODY DYNAMICS UNDER SHORTTERM ACCELERATION.
AD-429 027

MEDICAL RESEARCH
THE EFFECT OF AGEING ON THE G TOLERANCE OF RATS. II. A COMPARISON AT ONE MONTH WITH SURVIVORS AT THREE MONTHS OF AGE,.
AD-420 284

MONKEYS
CENTRIFUGATION OF THE WHITE-FRONTED CAPUCHIN MONKEY, CEBUS ALBIFRONS (HUMBOLDT).
AD-691 067

NYSTAGMUS
REPRINT: ACQUISITION AND RETENTION OF NYSTAGMIC HABITUATION IN CATS WITH DISTRIBUTED ACCELERATION EXPERIENCE.
AD-633 705
REPRINT: CONCOMITANT VISUAL STIMULATION DOES NOT ALTER HABITUATION OF NYSTAGMIC, OCULOGYRAL OR PSYCHOPHYSICAL RESPONSES TO ANGULAR ACCELERATION.
AD-641 418
ADAPTATION TO VESTIBULAR DISORIENTATION. III. INFLUENCE ON ADAPTATION OF INTERRUPTING NYSTAGMIC EYE MOVEMENTS WITH OPPOSING STIMULI,.
AD-649 615
ADAPTATION TO VESTIBULAR DISORIENTATION. VI. EYE-MOVEMENT AND SUBJECTIVE TURNING RESPONSES TO VARIED DURATION OF ANGULAR ACCELERATION,.
AD-671 855

PAIN
REPRINT: EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AD-638 719

PHYSICAL FITNESS
REPRINT: PHYSICAL CONDITIONING VERSUS GZ TOLERANCE.
AD-637 184

PHYSIOLOGY
PHOTOELECTRIC EARPIECE RECORDINGS AND PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION PRODUCED BY PARTIAL IMMERSION IN WATER.
AD-431 208

PILOTS
PILOT PERFORMANCE AND TOLERANCE STUDIES OF ORBITAL RE-ENTRY ACCELERATION.
AD-670 468

PITUITARY HORMONES
REPRINT: EFFECT OF GZ AND GX ACCELERATION ON PERIPHERAL VENOUS ADH LEVELS IN HUMANS.
AD-670 823

POSTURE
EFFECT OF HIGH ACCELERATION FORCES UPON PHYSIOLOGICAL FACTORS OF HUMANS PLACED IN A MODIFIED SUPINE POSITION.
AD-620 273

RADIATION EFFECTS
TRANSLATION OF RUSSIAN RESEARCH: FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT.
AD-663 197

RADIOGRAPHY
X-RAY MOTION MONITOR: LOW-DOSAGE, WIDE-VARIABLE-FIELD TELEVISION RADIOGRAPH FOR BIODYNAMIC ANALYSIS.
AD-650 491

RATS
CHANGES IN SPONTANEOUS ACTIVITY AS A MEASURE OF SENSITIVITY TO ROTATION IN THE WHITE RAT.
AD-617 752

RESPIRATION
MAXIMUM VOLUNTARY VENTILATION AFTER G SUB X IMPACT IN HUMANS.
AD-624 626
REPRINT: BLOOD GAS CHANGES IN THE ANESTHETIZED DOG DURING PROLONGED EXPOSURE TO POSITIVE RADIAL ACCELERATION.
AD-632 681
PULMONARY FUNCTION IN MAN UNDER PROLONGED ACCELERATION II. CORRELATION OF ARTERIAL BLOOD OXYGEN SATURATION WITH VENTILATION AND GAS BEING BREATHED.
AD-636 723

SAFETY HARNESS
RESTRAINT SYSTEM FOR APPLICATION IN RSUB Z AND -GSUB X ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS.
AD-612 957
REPRINT: REVIEW OF RESTRAINT SYSTEMS TEST METHODS.
AD-618 280
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS.
AD-624 487

SEMICIRCULAR CANALS
USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT.
AD-602 210
EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT ON NYSTAGMUS GENERATED BY ANGULAR ACCELERATION.
AD-608 570
INFLUENCE OF LABYRINTH ORIENTATION RELATIVE TO GRAVITY ON RESPONSES ELICITED BY STIMULATION OF THE HORIZONTAL SEMICIRCULAR CANALS.
AD-608 571

SEX
THE EFFECT OF SEX ON THE G TOLERANCE OF RATS.
AD-420 258

SPIN
REPRINT: HUMAN TOLERANCE TO GZ 100 PER CENT GRADIENT SPIN.
AD-635 719

SPINAL COLUMN
THE HUMAN SPINAL COLUMN AND UPWARD EJECTION ACCELERATION: AN APPRAISAL OF BIODYNAMIC IMPLICATIONS.
AD-664 553

TEST EQUIPMENT
A TORQUE MOTOR SERVOROTATOR FOR VESTIBULAR APPLICATION.
AD-644 002
INSTRUMENTATION FOR THE CORIOLIS ACCELERATION PLATFORM.
AD-666 379

TEST FACILITIES
THE CORIOLIS ACCELERATION PLATFORM. A UNIQUE VESTIBULAR RESEARCH DEVICE.
AD-647 311
PRINCIPLES OF BIODYNAMICS: SECTION A. CHAPTER V. DESCRIPTIVE CATALOG OF AEROSPACE MEDICAL BIODYNAMICS FACILITIES IN THE UNITED STATES.
AD-672 927

THORAX
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541

URINARY SYSTEM
REPRINT: EFFECT OF -7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS.
AD-697 417

VESTIBULAR APPARATUS
CONTROL OF AROUSAL AND THE EFFECTS OF REPEATED UNIDIRECTIONAL ANGULAR ACCELERATION ON HUMAN VESTIBULAR RESPONSES.
AD-603 419
EXPERIMENTAL DETERMINATION OF HUMAN VESTIBULAR SYSTEM RESPONSE THROUGH MEASUREMENT OF EYEBALL COUNTERROLL.
AD-618 416
THE EFFECT OF ACCELERATIONS ON THE VESTIBULAR ANALYZER: BIBLIOGRAPHY.
AD-636 474
REPRINT: INTERACTION VESTIBULAR STIMULI AND NYSTAGMIC HABITUATION.
AD-649 545
REPRINT: EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES.
AD-665 413

VISION
VISUAL-VESTIBULAR INTERACTION AND THRESHOLD FOR ANGULAR ACCELERATION.
AD-660 287

VISUAL ACUITY
EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
AD-603 963

WHOLE BODY IRRADIATION
REPRINT: THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS OF 760 MM OF MERCURY.
AD-663 053

*ADAPTATION(PHYSIOLOGY)
ACCELERATION
ADAPTATION TO PROLONGED CONSTANT ANGULAR ACCELERATION.
AD-666 178

BIOCHEMISTRY
BIOCHEMICAL CHANGES OCCURRING WITH ADAPTATION TO ACCELERATIVE FORCES DURING ROTATION,
AD-634 609

*AEROSPACE CRAFT
HUMAN ENGINEERING
REPRINT: MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946

*AMINES
ACCELERATION TOLERANCE
CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (GZ) ACCELERATION.
AD-634 519

*ARRHYTHMIA
ACCELERATION TOLERANCE
REPRINT: CARDIAC ARRHYTHMIAS OCCURRING DURING ACCELERATION.
AD-643 882

*ASTROPHYSICS
SCIENTIFIC RESEARCH
TRANSLATION OF RUSSIAN ARTICLES ON COSMIC RESEARCH.
AD-603 012

*AVIATION MEDICINE
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE.
AD-262 495

ACCELERATION TOLERANCE
RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.
AD-665 849

*BIBLIOGRAPHIES
A BIBLIOGRAPHY OF 1020 ANNOTATED REFERENCES ON ACCELERATION, DECELERATION, AND IMPACT STUDIES.
AD-286 930

*BIOCHEMISTRY
ACCELERATION TOLERANCE
TRANSLATION OF RUSSIAN RESEARCH: CHANGES IN THE CONTENT OF BIOLOGICALLY ACTIVE SUBSTANCES IN RATS UNDER THE ACTION OF RADIAL ACCELERATIONS.
AD-607 878

*BLACKOUT(PHYSIOLOGY)
AVIATION PERSONNEL
HIGH ACCELERATIONS IN INTERMEDIATE TRAINING: INCIDENCE OF SYMPTOMS AND AN ESTIMATE OF TOLERANCE TO 'G'.
AD-620 298

*BLOOD CIRCULATION
ACCELERATION TOLERANCE
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (GX) ACCELERATION.
AD-633 473

*CARDIOVASCULAR SYSTEM
EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM.
AD-255 298

ACCELERATION TOLERANCE
REPRINT: CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS.
AD-634 080
REPRINT: ABDOMINAL BLOOD FLOW CHANGES DURING ACCELERATION STRESS IN ANESTHETIZED DOGS.
AD-672 448

•CENTER OF MASS
HUMANS
MOTION OF THE HUMAN CENTER OF MASS AND ITS RELATIONSHIP TO THE MECHANICAL IMPEDANCE.
AD-637 182

•CENTRIFUGES
ACCELERATION TOLERANCE
PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT.•
AD-424 030
STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546

HUMANS
A COUNTERROTATOR FOR HUMAN CENTRIFUGE APPLICATION.•
AD-664 211

HYDRAULIC FLUIDS
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

MEDICAL EQUIPMENT
REPRINT: AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS.
AD-650 331

SPACE MEDICINE
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•CHEMOTHERAPEUTIC AGENTS
INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXYACETATE (LUCIORIL)•
AD-269 488

•CONDITIONED REFLEX
THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT•
AD-268 793

•DECELERATION
BEFORE A MANNED FLIGHT•
AD-269 691
A BIBLIOGRAPHY OF 1020 ANNOTATED REFERENCES ON ACCELERATION, DECELERATION, AND IMPACT STUDIES.
AD-286 930

•DECLERATION
MEASURING DEVICES (ELECTRICAL + ELECT
DYNAMIC RESPONSE ANALYSIS OF G SUB X IMPACT ON MAN.
AD-497 349

•DRUGS
INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXYACETATE (LUCIORIL)•
AD-269 488

•EAR
RESPONSE OF MAMMALIAN GRAVITY RECEPTORS TO SUSTAINED TILT•
AD-272 332

HEMORRHAGE
TRANSLATION OF RUSSIAN RESEARCH: HISTOMORPHOLOGICAL CHANGES IN THE INTERNAL EAR OF DOGS UNDER THE EFFECT OF RADIAL ACCELERATIONS.
AD-630 991

•EJECTION
FRACTURES(BONE)
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026

TOLERANCES(PHYSIOLOGY)
THE HUMAN SPINAL COLUMN AND UPWARD EJECTION ACCELERATION: AN APPRAISAL OF BIODYNAMIC IMPLICATIONS.•
AD-664 553

•ELECTROENCEPHALOGRAPHY
BLACKOUT (PHYSIOLOGY)
ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION, •
AD-438 485

•ENDURANCE
TRAINING
REPRINT: PHYSICAL CONDITIONING

VERSUS GZ TOLERANCE.
AD-637 184

•EPINEPHRINE
EXCRETION
CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (GZ) ACCELERATION.
AD-634 519

•EYE
THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT.
AD-268 793

•FIRE SAFETY
CENTRIFUGES
STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546

•FLIGHT SIMULATORS
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE.
AD-262 435

DESIGN
A COUNTERROTATOR FOR HUMAN CENTRIFUGE APPLICATION.•
AD-664 211

HYDRAULIC FLUIDS
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

VIBRATORS(MECHANICAL)
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AD-620 319

•FRACTURES(BONE)
SPINAL COLUMN
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026

•GEOLOGY
STANDARDIZATION OF CONSTANTS FOR AGE ESTIMATION BY THE ARGON METHOD.
AD-288 979

•HEART
ACCELERATION TOLERANCE
CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF 5GX AND 10GX.
AD-625 254

•HELMETS
ACCELERATION TOLERANCE
EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
AD-603 963

•HISTAMINE
ACCELERATION TOLERANCE
TRANSLATION OF RUSSIAN RESEARCH: CHANGES IN THE CONTENT OF BIOLOGICALLY ACTIVE SUBSTANCES IN RATS UNDER THE ACTION OF RADIAL ACCELERATIONS.
AD-607 878

•HUMAN ENGINEERING
ACCELERATION TOLERANCE
REPRINT: MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946

•HYDRAULIC FLUIDS
FIRE SAFETY
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

•IMPACT SHOCK
A VERTICAL ACCELERATOR FOR SIMULATION OF VIBRATION AND BUFFETING ENCOUNTERED IN AEROSPACE OPERATIONS. DESIGN, MOTION CAPABILITIES, CONTROL, AND SAFETY FEATURES. PERIODIC OR RANDOM ACCELERATION PATTERNS. PEAK TO PEAK AMPLITUDES OF PLUS OR MINUS 5 FT FROM 0.5 TO 10 CPS. MAXIMUM ACCELERATION FROM 2.5 TO 3 G.
AD-287 996

•INDEXES
HUMAN ACCELERATION STUDIES•
AD-266 076

•INSTRUMENTATION
SPACE MEDICINE
PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT,•
AD-424 030

•LUNGS
ACCELERATION TOLERANCE
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (GX) ACCELERATION•
AD-633 473

•MAN
SOME NOTES ON THE PHYSIOLOGICAL TOLERANCE TO ACCELERATION•
AD-257 737
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT)• A DESCRIPTION OF FACILITIES IN USE AND PROPOSED•
AD-266 078

•MEDICAL EQUIPMENT
CENTRIFUGES
REPRINT: AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS•
AD-690 331

•MODELS (SIMULATIONS)
ACCELERATION
PHOTOELECTRIC EARPIECE RECORDINGS AND PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION PRODUCED BY PARTIAL IMMERSION IN WATER•
AD-431 208

•MONITORS
CENTRIFUGES
PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT,•
AD-424 030

•MONKEYS
ACCELERATION TOLERANCE
CENTRIFUGATION OF THE WHITE-FRONTED CAPUCHIN MONKEY, CEBUS ALBIFRONS (HUMBOLDT),•
AD-651 067

•MOTION SICKNESS
SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE•
AD-268 791

BIOCHEMISTRY
BIOCHEMICAL CHANGES OCCURRING WITH ADAPTATION TO ACCELERATIVE FORCES DURING ROTATION,•
AD-634 609

•NYSTAGMUS
ACCELERATION TOLERANCE
REPRINT: ACQUISITION AND RETENTION OF NYSTAGMIC HABITUATION IN CATS WITH DISTRIBUTED ACCELERATION EXPERIENCE•
AD-633 705
REPRINT: CONCOMITANT VISUAL STIMULATION DOES NOT ALTER HABITUATION OF NYSTAGMIC, OCULOGYRAL OR PSYCHOPHYSICAL RESPONSES TO ANGULAR ACCELERATION•
AD-641 418
ADAPTATION TO VESTIBULAR DISORIENTATION• VI• EYE-MOVEMENT AND SUBJECTIVE TURNING RESPONSES TO VARIED DURATION OF ANGULAR ACCELERATION,•
AD-671 855

HABITUATION LEARNING
REPRINT: INTERACTION VESTIBULAR STIMULI AND NYSTAGMIC HABITUATION•
AD-649 545
ADAPTATION TO VESTIBULAR DISORIENTATION• III• INFLUENCE ON ADAPTATION OF INTERRUPTING NYSTAGMIC EYE MOVEMENTS WITH OPPOSING STIMULI,•
AD-649 615

•OSCILLATORS
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT)• A DESCRIPTION OF FACILITIES IN USE AND PROPOSED•
AD-266 078

•PAIN
ACCELERATION TOLERANCE

REPRINT: EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AD-638 719

•PEPTIDE HYDROLASES
SECRETION
REPRINT: PERIPHERAL VENOUS RENIN LEVELS DURING GZ ACCELERATION.
AD-672 446

•PHARMACOLOGY
INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXYACETATE (LUCIDRIL).
AD-269 488

•PHYSICAL FITNESS
ACCELERATION TOLERANCE
REPRINT: PHYSICAL CONDITIONING VERSUS GZ TOLERANCE.
AD-637 184

•PHYSIOLOGY
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE.
AD-262 435

ACCELERATION TOLERANCE
TRANSLATION OF FOREIGN RESEARCH ON THE PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM DURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME AND INTENSITY, DIRECTED ALONG THE SPINEBREAST AXIS.
AD-426 900

•PITUITARY HORMONES
SECRETION
REPRINT: EFFECT OF GZ AND GX ACCELERATION ON PERIPHERAL VENOUS ADH LEVELS IN HUMANS.
AD-670 823

•PRESSURE BREATHING
OXYGEN CONSUMPTION
THE EFFECT OF POSITIVE PRESSURE BREATHING ON ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION IN SUBJECTS EXPOSED TO HIGH TRANSVERSE ACCELERATION.
AD-424 922

•PRIMATES
SOME NOTES ON THE PHYSIOLOGICAL TOLERANCE TO ACCELERATION.
AD-297 737
EXPOSURE OF FIVE MALE CHIMPANZEES TO SIMULATED SPACE FLIGHT CONDITIONS OF LAUNCH ACCELERATION AND ATMOSPHERIC RE-ENTRY DECELERATION. PHYSIOLOGICAL RESPONSES SERVE AS A BASELINE FOR THE STUDY OF THE EFFECTS OF WEIGHTLESSNESS.
AD-282 883

•RADIATION EFFECTS
ACCELERATION TOLERANCE
TRANSLATION OF RUSSIAN RESEARCH: FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT.
AD-663 197

•RADIOGRAPHY
ACCELERATION TOLERANCE
X-RAY MOTION MONITOR: LOW-DOSAGE, WIDE-VARIABLE-FIELD TELEVISION RADIOGRAPH FOR BIODYNAMIC ANALYSIS.
AD-650 481

•RECORDING SYSTEMS
THE EFFECTS OF TRANSVERSE ACCELERATIONS AND EXPONENTIAL TIME-LAG CONSTANTS ON COMPENSATORY TRACKING PERFORMANCE.
AD-268 185

•RELAXATION (PHYSIOLOGY)
ACCELERATION TOLERANCE
REPRINT: TOLERANCE TO TRANSVERSE (GX) AND HEADWARD (GZ) ACCELERATION AFTER PROLONGED BED REST.
AD-615 374

•REPORTS
REPORTS ON HUMAN ACCELERATION.
AD-266 077

•RESPIRATION
ACCELERATION TOLERANCE
PULMONARY FUNCTION IN MAN UNDER PROLONGED ACCELERATION II. CORRELATION OF ARTERIAL BLOOD OXYGEN SATURATION WITH VENTILATION AND GAS BEING BREATHED.
AD-636 723

STRESS(PHYSIOLOGY)

MAXIMUM VOLUNTARY VENTILATION AFTER G SUB X IMPACT IN HUMANS.
AD-624 626

•ROTATION
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE.
AD-262 439
THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS, AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT.
AD-268 793

ADAPTATION (PHYSIOLOGY)
PHYSIO-MECHANICAL EFFECTS OF ACCELERATIONS ON HUMAN BEINGS WORKING IN A ROTATING ENVIRONMENT.
AD-610 192

SENSITIVITY
CHANGES IN SPONTANEOUS ACTIVITY AS A MEASURE OF SENSITIVITY TO ROTATION IN THE WHITE RAT.
AD-617 792

STRESS(PHYSIOLOGY)
REPRINT: CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS.
AD-624 080

•SAFETY HARNESS
ACCELERATION TOLERANCE
RESTRAINT SYSTEM FOR APPLICATION IN RSUB Z AND -GSUB X ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS.
AD-612 997
REPRINT: REVIEW OF RESTRAINT SYSTEMS TEST METHODS.
AD-618 280

OPTIMIZATION
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS.
AD-624 487

•SEMICIRCULAR CANALS
ACCELERATION TOLERANCE
USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT.
AD-602 210
EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT ON NYSTAGMUS GENERATED BY ANGULAR ACCELERATION.
AD-608 970
INFLUENCE OF LABYRINTH ORIENTATION RELATIVE TO GRAVITY ON RESPONSES ELICITED BY STIMULATION OF THE HORIZONTAL SEMICIRCULAR CANALS.
AD-608 971

•SEX
ACCELERATION TOLERANCE
THE EFFECT OF SEX ON THE G TOLERANCE OF RATS.•
AD-420 258

•SIMULATION
EXPOSURE OF FIVE MALE CHIMPANZEES TO SIMULATED SPACE FLIGHT CONDITIONS OF LAUNCH ACCELERATION AND ATMOSPHERIC RE-ENTRY DECELERATION. PHYSIOLOGICAL RESPONSES SERVE AS A BASELINE FOR THE STUDY OF THE EFFECTS OF WEIGHTLESSNESS.
AD-282 893

•SPACE FLIGHT
A BIBLIOGRAPHY OF 1020 ANNOTATED REFERENCES ON ACCELERATION, DECELERATION, AND IMPACT STUDIES.
AD-286 930

PHYSIOLOGY
ANNOTATED TITLE: TRANSLATION OF RUSSIAN RESEARCH: SPEED, ACCELERATION, WEIGHTLESSNESS: SOME PROBLEMS IN PHYSICS AND PHYSIOLOGY IN CONNECTION WITH ATMOSPHERIC AND SPACE FLIGHTS.
AD-602 339

SCIENTIFIC RESEARCH
TRANSLATION OF RUSSIAN ARTICLES ON COSMIC RESEARCH.
AD-603 012

•SPACE MEDICINE
SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE.
AD-268 791

CENTRIFUGES
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

VESTIBULAR APPARATUS
THE EFFECT OF ACCELERATIONS ON THE VESTIBULAR ANALYZER: BIBLIOGRAPHY.•
AD-636 474

•SPINAL COLUMN
ACCELERATION TOLERANCE
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026
THE HUMAN SPINAL COLUMN AND UPWARD EJECTION ACCELERATION: AN APPRAISAL OF BIODYNAMIC IMPLICATIONS.•
AD-664 553

•STRESS (PHYSIOLOGY)
ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE•
AD-262 435

DECELERATION
DYNAMIC RESPONSE ANALYSIS OF G SUB X IMPACT ON MAN.
AD-457 349

•STRESS(PHYSIOLOGY)
ACCELERATION
RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.•
AD-665 649

FLIGHT SIMULATORS
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AD-620 319

•TEST FACILITIES
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT). A DESCRIPTION OF FACILITIES IN USE AND PROPOSED•
AD-266 078
A VERTICAL ACCELERATOR FOR SIMULATION OF VIBRATION AND BUFFETING ENCOUNTERED IN AEROSPACE OPERATIONS. DESIGN, MOTION CAPABILITIES, CONTROL, AND SAFETY FEATURES. PERIODIC OR RANDOM ACCELERATION PATTERNS. PEAK TO PEAK AMPLITUDES OF PLUS OR MINUS 5 FT FROM 0.5 TO 10 CPS. MAXIMUM ACCELERATION FROM 2.5 TO 3 G.
AD-287 996

ACCELERATION TOLERANCE
THE CORIOLIS ACCELERATION PLATFORM. A UNIQUE VESTIBULAR RESEARCH DEVICE.•
AD-647 311

•THORAX
ACCELERATION TOLERANCE
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (GX) ACCELERATION.
AD-613 331

ACCELERATION TOLERANCES
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
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VIBRATION
REPRINT: MAN'S SHORT-TIME TOLERANCE TO SINUSOIDAL VIBRATION.
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ACCELERATION TOLERANCE
CONTROL OF AROUSAL AND THE EFFECTS OF REPEATED UNIDIRECTIONAL ANGULAR ACCELERATION ON HUMAN VESTIBULAR RESPONSES.
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EXPERIMENTAL DETERMINATION OF HUMAN VESTIBULAR SYSTEM RESPONSE THROUGH MEASUREMENT OF EYEBALL COUNTERROLL.
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A TORQUE MOTOR SERVOROTATOR FOR VESTIBULAR APPLICATION.•
AD-644 003
THE CORIOLIS ACCELERATION PLATFORM. A UNIQUE VESTIBULAR RESEARCH DEVICE.•
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REPRINT: INTERACTION VESTIBULAR STIMULI AND NYSTAGMIC HABITUATION.
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REPRINT: EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES.
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ADAPTATION TO PROLONGED CONSTANT

ANGULAR ACCELERATION.•
AD-666 178

ADAPTATION(PHYSIOLOGY)
ADAPTATION TO VESTIBULAR DISORIENTATION. III. INFLUENCE ON ADAPTATION OF INTERRUPTING NYSTAGMIC EYE MOVEMENTS WITH OPPOSING STIMULI.•
AD-649 515

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AD-636 474

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PAIN
REPRINT: EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH G7 AND GX VIBRATION.
AD-638 719

TOLERANCES(PHYSIOLOGY)
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.•
AD-638 792

VISUAL ACUITY
EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
AD-603 963

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A VERTICAL ACCELERATOR FOR SIMULATION OF VIBRATION AND BUFFETING ENCOUNTERED IN AEROSPACE OPERATIONS. DESIGN, MOTION CAPABILITIES, CONTROL, AND SAFETY FEATURES. PERIODIC OR RANDOM ACCELERATION PATTERNS. PEAK TO PEAK AMPLITUDES OF PLUS OR MINUS 5 FT FROM 0.5 TO 10 CPS. MAXIMUM ACCELERATION FROM 2.5 TO 3 G.
AD-287 996

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FLIGHT SIMULATORS
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AD-620 319

•VISION
ACCELERATION TOLERANCE
VISUAL-VESTIBULAR INTERACTION AND THRESHOLD FOR ANGULAR ACCELERATION.•
AD-660 297

•VISUAL ACUITY
VIBRATION
EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
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HUMAN ACCELERATION STUDIES•
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ACCELERATION TOLERANCE
REPRINT: THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS OF 760 MM OF MERCURY.
AD-663 053

•ALEXANDER, W. C.
• • •
ABDOMINAL BLOOD FLOW CHANGES DURING ACCELERATION STRESS IN ANESTHETIZED DOGS.
AD-672 448

•ANDERSON, JOHN J.
• • •
THE CORIOLIS ACCELERATION PLATFORM, A UNIQUE VESTIBULAR RESEARCH DEVICE.
AD-647 311
• • •
A COUNTERROTATOR FOR HUMAN CENTRIFUGE APPLICATION.
AD-664 211

•ANTIPOV, V. V.
• • •
FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT.
AD-643 197

•BALDES, E. J.
• • •
PHOTOELECTRIC EARPIECE RECORDINGS AND OTHER PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION (+G7) PRODUCED BY PARTIAL IMMERSION IN WATER.
AD-431 208

•BANCHERO, NATALIO
• • •
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+GX) ACCELERATION.
AD-613 331
• • •
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541

•BARER, A.A.
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PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM DURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME AND INTENSITY, DIRECTED ALONG THE SPINE BREAST AXIS.
AD-426 900

•BARR, P. O.
• • •
BLOOD GAS CHANGES IN THE ANESTHETIZED DOG DURING PROLONGED EXPOSURE TO POSITIVE RADIAL ACCELERATION.
AD-632 681

•BATES, GEORGE
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HUMAN ACCELERATION STUDIES
AD-266 076

•BJURSTEDT, H.
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BLOOD GAS CHANGES IN THE ANESTHETIZED DOG DURING PROLONGED EXPOSURE TO POSITIVE RADIAL ACCELERATION.
AD-632 681

•BRICKER, LEE A.
• • •
EFFECT OF +7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS.
AD-657 417

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• • •
MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946
• • •
MAN'S SHORT-TIME TOLERANCE TO SINUSOIDAL VIBRATION.
AD-617 011

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• • •
ACQUISITION AND RETENTION OF NYSTAGMIC HABITUATION IN CATS WITH DISTRIBUTED ACCELERATION EXPERIENCE.
AD-633 705
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CONCOMITANT VISUAL STIMULATION DOES NOT ALTER HABITUATION OF NYSTAGMIC, OCULOGYRAL OR PSYCHOPHYSICAL RESPONSES TO ANGULAR ACCELERATION.
AD-641 418
• • •
INTERACTING VESTIBULAR STIMULI AND NYSTAGMIC HABITUATION.
AD-649 545
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ADAPTATION TO PROLONGED CONSTANT ANGULAR ACCELERATION.
AD-666 178

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CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (+GZ) ACCELERATION.
AD-634 919

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• • •

THE EFFECT OF POSITIVE PRESSURE BREATHING ON ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION IN SUBJECTS EXPOSED TO HIGH TRANSVERSE ACCELERATION,
AD-424 922

•CASEY, HAROLD W.

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THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS AT 740 MM OF MERCURY,
AD-663 053

•CHAMBERS, RANDALL M.

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PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT,
AD-424 030

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THE EFFECT OF TRANSVERSE ACCELERATION ON OXYGEN TENSION IN BRAIN TISSUE,
AD-430 032

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HUMAN ACCELERATION STUDIES
AD-246 076

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EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AD-638 719

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AD-617 031

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AD-620 319

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AD-431 208

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• • •

BIOCHEMICAL CHANGES OCCURRING WITH ADAPTATION TO ACCELERATIVE FORCES DURING ROTATION,
AD-634 609

•COLERIDGE, J. C. G.

• • •

BLOOD GAS CHANGES IN THE ANESTHETIZED DOG DURING PROLONGED EXPOSURE TO POSITIVE RADIAL ACCELERATION,
AD-632 681

•COLLINS, FREDERICK G.

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EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES,
AD-665 413

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ADAPTATION TO VESTIBULAR DISORIENTATION. III. INFLUENCE ON ADAPTATION OF INTERRUPTING NYSTAGMIC EYE MOVEMENTS WITH OPPOSING STIMULI,
AD-649 615

•COLLINS, WILLIAM E.
• • •
TASK - CONTROL OF AROUSAL AND THE EFFECTS OF REPEATED UNIDIRECTIONAL ANGULAR ACCELERATION ON HUMAN VESTIBULAR RESPONSES,
AD-603 419
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ADAPTATION TO VESTIBULAR DISORIENTATION. VI. EYE-MOVEMENT AND SUBJECTIVE TURNING RESPONSES TO VARIED DURATION OF ANGULAR ACCELERATION,
AD-671 855

•COOPER, KENNETH H.
• • •
PHYSICAL CONDITIONING VERSUS +GZ TOLERANCE.
AD-637 184

•CORDY, DONALD
• • •
THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS AT 760 MM OF MERCURY,
AD-663 353

•CORREIA, MANNING J.
• • •
USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT.
AD-602 210
• • •
INFLUENCE OF LABYRINTH ORIENTATION RELATIVE TO GRAVITY ON RESPONSES ELICITED BY STIMULATION OF THE HORIZONTAL SEMICIRCULAR CANALS.
AD-618 571

•CRAMER, ROBERT L
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RESPONSE OF MAMMALIAN GRAVITY RECEPTORS TO SUSTAINED TILT
AD-272 332

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EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES,
AD-645 413

•CRAMPTON, GEORGE H.
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CONCOMITANT VISUAL STIMULATION DOES NOT ALTER HABITUATION OF NYSTAGMIC, OCULOGYRAL OR PSYCHOPHYSICAL RESPONSES TO ANGULAR ACCELERATION,
AD-641 418

•CREWS, HARRY C., JR
• • •
PHYSIO-MECHANICAL EFFECTS OF ACCELERATIONS ON HUMAN BEINGS WORKING IN A ROTATING ENVIRONMENT.
AD-610 192

•CRONIN, LUCILLE
• • •
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+GX) ACCELERATION.
AD-613 331

•DAVIES, CHESLEY R.
• • •
EFFECT OF -7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS,
AD-657 417

•DAVYDOV, B. I.
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FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT,
AD-663 197

•DOTTORE, ROBERT A.
• • •
EFFECT OF -7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS,
AD-657 417

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• • •
EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES,
AD-665 413

•EDMUND, B., JR
• • •
X-RAY MOTION MONITOR: LOW-DOSAGE, WIDE-VARIABLE-FIELD TELEVISION RADIOGRAPH FOR BIODYNAMIC ANALYSIS.
AD-650 481

•EGGLESTON, L. A.
• • •
A STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546
• • •
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS

ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

•ESKIN, ARNOLD

• • •

CHANGES IN SPONTANEOUS ACTIVITY AS A MEASURE OF SENSITIVITY TO ROTATION IN THE WHITE RAT.
AD-617 752

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EFFECT OF +GZ AND +GX ACCELERATION ON PERIPHERAL VENOUS AOH LEVELS IN HUMANS.
AD-670 823

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PERIPHERAL VENOUS RENIN LEVELS DURING +GZ ACCELERATION.
AD-672 446

•FEDER, H. C.

• • •

DYNAMIC RESPONSE ANALYSIS OF +GX IMPACT ON MAN.
AD-457 349

•FINNEY, L. M.

• • •

BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•FLETCHER, JOHN G.

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RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.
AD-665 849

•FOSTER, PETER

• • •

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN EXPERIENCE PARAMETERS AND SUBJECT ACCELERATION RESPONSE IN EXPERIMENTAL IMPACT.
AD-630 788

•GALAMBOS, ROBERT

• • •

REPORTS ON HUMAN ACCELERATION
AD-246 377

•GIL'BERT, L

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BEFORE A MANNED FLIGHT
AD-269 691

•GOLDFIEN, AALAN

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CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (+GZ) ACCELERATION.
AD-634 519

•GOLDMAN, MARVIN

• • •

THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS AT 760 MM OF MERCURY.
AD-663 053

•GOLOV, G.A.

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PHYSIOLOGICAL REACTIONS OF THE HUMAN ORGANISM DURING THE ACTION OF ACCELERATIONS, MAXIMUM IN TIME AND INTENSITY, DIRECTED ALONG THE SPINE BREAST AXIS.
AD-426 900

•GOROON, J. J.

• • •

ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION.
AD-438 485

•GRAYBIEL, A

• • •

THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT
AD-268 793

•GRAYBIEL, ASHTON

• • •

ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE
AD-262 435

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SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE
AD-268 791

• • •
THE EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT ON NYSTAGMUS GENERATED BY ANGULAR ACCELERATION.
AD-608 570

• • •
BIOCHEMICAL CHANGES OCCURRING WITH ADAPTATION TO ACCELERATIVE FORCES DURING ROTATION.
AD-634 509

•GRIMES, R. H.
• • •
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•GUEDRY, F.E. JR
• • •
THE APPEARANCE OF COMPENSATORY NYSTAGMUS IN HUMAN SUBJECTS AS A CONDITIONED RESPONSE DURING ADAPTATION TO A CONTINUOUSLY ROTATING ENVIRONMENT
AD-268 793

•GUEDRY, FRED E.
• • •
ADAPTATION TO VESTIBULAR DISORIENTATION. VI. EYE-MOVEMENT AND SUBJECTIVE TURNING RESPONSES TO VARIED DURATION OF ANGULAR ACCELERATION.
AD-671 855

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• • •
THE EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT ON NYSTAGMUS GENERATED BY ANGULAR ACCELERATION.
AD-608 570

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AD-608 571

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ROTATION DEVICES, OTHER THAN CENTRIFUGES AND MOTION SIMULATORS: THE RATIONALE FOR THEIR SPECIAL CHARACTERISTICS AND USE
AD-262 435

•HANSON, PETER G.
• • •
MAXIMUM VOLUNTARY VENTILATION AFTER + G SUB X IMPACT IN HUMANS.
AD-624 626

•HARTZLER, VICTOR L.
• • •
EXPERIMENTAL DETERMINATION OF HUMAN VESTIBULAR SYSTEM RESPONSE THROUGH MEASUREMENT OF EYEBALL COUNTERROLL.
AD-618 416

•HENZEL, J. H.
• • •
EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AD-638 719

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• • •
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026

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THE HUMAN SPINAL COLUMN AND UPWARD EJECTION ACCELERATION: AN APPRAISAL OF BIODYNAMIC IMPLICATIONS.
AD-664 553

•HIATT, EDWIN P
• • •
REPORTS ON HUMAN ACCELERATION
AD-266 077

•HIX, W. CARROLL
• • •
A COUNTERROTATOR FOR HUMAN CENTRIFUGE APPLICATION.
AD-664 211

•HIXSON, W. CARROLL
• • •
A TORQUE MOTOR SERVOROTATOR FOR VESTIBULAR APPLICATION.
AD-644 003

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THE CORIOLIS ACCELERATION PLATFORM. A UNIQUE VESTIBULAR RESEARCH DEVICE.
AD-647 311

• • •
INSTRUMENTATION FOR THE CORIOLIS

ACCELERATION PLATFORM.
AD-666 379

•HOOD JR, WILLIAM B.
• • •
CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS,
AD-634 080

•HOPPIN JR, FREDERIC C.
• • •
PULMONARY FUNCTION IN MAN UNDER PROLONGED ACCELERATION II. CORRELATION OF ARTERIAL BLOOD OXYGEN SATURATION WITH VENTILATION AND GAS BEING BREATHED.
AD-636 723

•HOPPIN JR, FREDERIC G.
• • •
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (+GX) ACCELERATION.
AD-633 473

•HOWLAND, B.
• • •
AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS,
AD-650 331

•HOWLAND, H. C.
• • •
AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS,
AD-650 331

•HYDE, ALVIN S.
• • •
A SUMMARY OF HUMAN TOLERANCE TO PROLONGED ACCELERATION.
AD-615 570

•HYDE, RICHARD W.
• • •
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (+GX) ACCELERATION.
AD-633 473

•ISAKOV, P. K.
• • •
SPEED, ACCELERATION, WEIGHTLESSNESS: SOME PROBLEMS IN PHYSICS AND PHYSIOLOGY IN CONNECTION WITH ATMOSPHERIC AND SPACE FLIGHTS ,
AD-602 335

•JAHOE, J.
• • •
AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS,
AD-650 331

•JENSEN, R. E.
• • •
ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION,
AD-438 485

•JOHNSON, WAYNE A.
• • •
EFFECT OF -7GX ACCELERATION ON RENAL EXCRETION OF SOLUTES IN RABBITS,
AD-657 417

•JOHNSTON, R. K.
• • •
A STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546
• • •
SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

•KASHLER, RICHARD C
• • •
THE EFFECTS OF TRANSVERSE ACCELERATIONS AND EXPONENTIAL TIME-LAG CONSTANTS ON COMPENSATORY TRACKING PERFORMANCE
AD-268 195

•KENNEDY, ROBERT S
• • •
SYMPTOMATOLOGY DURING PROLONGED EXPOSURE IN A CONSTANTLY ROTATING ENVIRONMENT AT A VELOCITY OF ONE REVOLUTION PER MINUTE
AD-268 791

•KHAZEN, I. M.
• • •
CHANGES IN THE CONTENT OF BIOLOGICALLY ACTIVE SUBSTANCES IN RATS UNDER THE ACTION OF RADIAL ACCELERATIONS,

AD-607 978

•KNEPTON, JAMES C., JR
• • •
CENTRIFUGATION OF THE WHITE-FRONTED CAPUCHIN MONKEY, CEBUS ALBIFRONS (HUMBOLDT).
AD-651 067

•KOGAN, R. E.
• • •
HISTOMORPHOLOGICAL CHANGES IN THE INTERNAL EAR OF DOGS UNDER THE EFFECT OF RADIAL ACCELERATIONS,
AD-630 991

•KOVALENKO, YE. A.
• • •
THE EFFECT OF TRANSVERSE ACCELERATION ON OXYGEN TENSION IN BRAIN TISSUE,
AD-430 032

•KUHL, DAVID E.
• • •
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (+GX) ACCELERATION.
AD-633 473

•LAMB, L. E.
• • •
CARDIAC ARRHYTHMIAS OCCURRING DURING ACCELERATION.
AD-643 882

•LANSBERG, MARTIN P.
• • •
THE EFFECT OF CHANGING THE RESULTANT LINEAR ACCELERATION RELATIVE TO THE SUBJECT ON NYSTAGMUS GENERATED BY ANGULAR ACCELERATION.
AD-608 570

•LEVEDAHL, B.H
• • •
SOME NOTES ON THE PHYSIOLOGICAL TOLERANCE TO ACCELERATION
AD-257 737

•LEVERETT, S. D.
• • •
CARDIAC ARRHYTHMIAS OCCURRING DURING ACCELERATION.
AD-643 882

•LEVERETT, SIDNEY D., JR
• • •
TOLERANCE TO TRANSVERSE (+GX) AND HEADWARD (+GZ) ACCELERATION AFTER PROLONGED BED REST,
AD-615 274

•LEYSETH, WILLIAM
• • •
X-RAY MOTION MONITOR: LOW-DOSAGE, WIDE-VARIABLE-FIELD TELEVISION RADIOGRAPH FOR BIODYNAMIC ANALYSIS.
AD-650 481

•LIM, SAMUEL T.
• • •
RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.
AD-665 849

•LINDBERG, EVAN F.
• • •
PHOTOELECTRIC EARPIECE RECORDINGS AND OTHER PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION (+GZ) PRODUCED BY PARTIAL IMMERSION IN WATER,
AD-431 208

•LOWRY, R.D
• • •
DESCRIPTION AND PERFORMANCE EVALUATION OF THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR
AD-287 996

•LOWRY, RICHARD D.
• • •
DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTERN GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AD-620 219

•MANDEL, MORRIS J.
• • •
MAN'S SHORT-TIME TOLERANCE TO SINUSOIDAL VIBRATION.
AD-617 011

•MARKARYAN, S. S.
• • •
HISTOMORPHOLOGICAL CHANGES IN THE INTERNAL EAR OF DOGS UNDER THE EFFECT OF RADIAL ACCELERATIONS,
AD-630 991

•MARSHALL, JOHN E.
• • •
VISUAL-VESTIBULAR INTERACTION AND THRESHOLD FOR ANGULAR ACCELERATION.
AD-660 287

•MARTIN, PAUL J.
• • •
MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946

•MARTZ, B. L.
• • •
PERIPHERAL VENOUS RENIN LEVELS DURING +GZ ACCELERATION.
AD-672 446

•MCLEOD, MICHAEL E.
• • •
USE OF CALORIC TEST IN EVALUATING THE EFFECTS OF GRAVITY ON CUPULA DISPLACEMENT.
AD-602 210

•MEEHAN, J.P
• • •
REPORTS ON HUMAN ACCELERATION
AD-266 077

•MILLER, PERRY B.
• • •
TOLERANCE TO TRANSVERSE (+GX) AND HEADWARD (+GZ) ACCELERATION AFTER PROLONGED BED REST.
AD-615 374

•MOHR, G. C.
• • •
EFFECT OF ANTERIOR INTERCOSTAL NERVE BLOCK ON THE THRESHOLD OF THORACTIC PAIN ASSOCIATED WITH GZ AND GX VIBRATION.
AD-638 719

•MOHR, GEORGE C.
• • •
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026

•MOORE, WARD W.
• • •
EFFECT OF +GZ AND +GX ACCELERATION ON PERIPHERAL VENOUS ADH LEVELS IN HUMANS.
AD-670 823

•NELSON, JOHN G.
• • •
PILOT BIOMEDICAL AND PSYCHOLOGICAL INSTRUMENTATION FOR MONITORING PERFORMANCE DURING CENTRIFUGE SIMULATIONS OF SPACE FLIGHT.
AD-424 030

•NIVEN, JORMA I.
• • •
A TORQUE MOTOR SERVOROTATOR FOR VESTIBULAR APPLICATION.
AD-644 003

•NOLAN, A. CLARK
• • •
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+GX) ACCELERATION.
AD-613 331

•NYBERG, J. W.
• • •
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•OLEYNIK, R. J.
• • •
HUMAN ACCELERATION EXPERIENCE AT THE U.S. NAVAL AIR DEVELOPMENT CENTER-JOHNSVILLE: 1 JANUARY 1961 30 DECEMBER 1965.
AD-655 436

•PANCHENKOVA, E. F.
• • •
FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT.
AD-663 197

•PATTON, R. M.
• • •
HUMAN ACCELERATION EXPERIENCE AT THE U.S. NAVAL AIR DEVELOPMENT CENTER-JOHNSVILLE: 1 JANUARY 1961-30 DECEMBER 1965.
AD-655 436

•PAYNE, PETER R.
• • •
PERSONNEL RESTRAINT AND SUPPORT SYSTEM DYNAMICS.
AD-624 487

•PECK, T. P.
• • •
EFFECTS OF ACCELERATION AND 'G'

LOADINGS ON MAN AND ANIMALS 1945-1959; A BIBLIOGRAPHY.
AD-669 017

• • •

EFFECTS OF ACCELERATION AND 'G' LOADINGS ON MAN AND ANIMALS 1945-1959; A BIBLIOGRAPHY.
AD-669 017

•PIEMME, THOMAS E.

• • •

HUMAN TOLERANCE TO GZ 100 PER CENT GRADIENT SPIN.
AD-635 719

•POLIS, B. DAVID

• • •

INCREASE IN ACCELERATION TOLERANCE OF THE RAT BY 2-DIMETHYLAMINOETHYL P-CHLOROPHENOXYACETATE (LUCIDRIL)
AD-249 488

•POPF, EDWARD E.

• • •

RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.
AD-665 849

•POPKOV, V. L.

• • •

THE EFFECT OF TRANSVERSE ACCELERATION ON OXYGEN TENSION IN BRAIN TISSUE.
AD-430 032

•PRICE, J.F

• • •

PHYSIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF SPACE FLIGHT: A BIBLIOGRAPHY. VOLUME I. ACCELERATION, DECELERATION, AND IMPACT
AD-286 930

•PRIMIANO, FRANK P., JR

• • •

DISTORTION ANALYSIS OF THE ACCELERATION PRODUCED BY THE WESTER' GEAR CORPORATION MODEL 4010 HIGH AMPLITUDE VIBRATION MACHINE.
AD-620 319

• • •

THE MOTION OF THE HUMAN CENTER OF MASS AND ITS RELATIONSHIP TO THE MECHANICAL IMPEDANCE.
AD-637 182

•PRYOR, A. J.

• • •

A STUDY OF THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE.
AD-624 546

• • •

SUMMARY OF COST AND TIME REQUIRED FOR MODIFICATIONS AND CONVERSIONS ON THE USAF SCHOOL OF AEROSPACE MEDICINE HUMAN CENTRIFUGE AND ROTATIONAL FLIGHT SIMULATOR.
AD-627 430

•RAAB, HAROLD W.

• • •

A SUMMARY OF HUMAN TOLERANCE TO PROLONGED ACCELERATION.
AD-615 570

•REED, JOHN H., JR

• • •

THE EFFECT OF POSITIVE PRESSURE BREATHING ON ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION IN SUBJECTS EXPOSED TO HIGH TRANSVERSE ACCELERATION.
AD-424 922

•REEVES, ELIZABETH

• • •

THE EFFECT OF SEX ON THE G TOLERANCE OF RATS.
AD-420 258

• • •

THE EFFECT OF AGEING ON THE G TOLERANCE OF RATS. II. A COMPARISON AT ONE MONTH WITH SURVIVORS AT THREE MONTHS OF AGE.
AD-420 284

•RICCIO, DAVID C.

• • •

CHANGES IN SPONTANEOUS ACTIVITY AS A MEASURE OF SENSITIVITY TO ROTATION IN THE WHITE RAT.
AD-617 752

•ROCCAFORTE, PHILIP A.

• • •

EXPERIMENTAL DETERMINATION OF HUMAN VESTIBULAR SYSTEM RESPONSE THROUGH MEASUREMENT OF EYEBALL COUNTERROLL.
AD-618 416

•ROGGE, JAMES D.

• • •

EFFECT OF +GZ AND +GX ACCELERATION ON PERIPHERAL VENOUS AOH LEVELS IN

HUMANS.
AD-670 923

• • •

PERIPHERAL VENOUS RENIN LEVELS DURING +GZ ACCELERATION.
AD-672 446

•RODT, E. H.

• • •

DYNAMIC RESPONSE ANALYSIS OF +GX IMPACT ON MAN.
AD-457 349

•ROTHE, W. E.

• • •

RESEARCH ON THE HUMAN PHYSIOLOGIC RESPONSE TO PROLONGED ROTATION AND ANGULAR ACCELERATION. A. ENGINEERING ACTIVITIES; B. PHYSIOLOGIC ACTIVITIES.
AD-665 949

•RUTISHAUSER, WILHELM J.

• • •

END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 941

•SAKSONOV, P. P.

• • •

FURTHER RESEARCH INTO THE EFFECT OF IONIZING RADIATION COMBINED WITH G-LOADING DURING SPACE FLIGHT.
AD-642 197

•SANDLER, HAROLD

• • •

THE EFFECT OF POSITIVE PRESSURE BREATHING ON ARTERIAL OXYGEN SATURATION AND PULMONARY VENTILATION IN SUBJECTS EXPOSED TO HIGH TRANSVERSE ACCELERATION.
AD-424 922

• • •

CINERADIOGRAPHIC OBSERVATIONS OF HUMAN SUBJECTS DURING TRANSVERSE ACCELERATIONS OF +5GX AND +10GX.
AD-625 254

•SEGAR, WILLIAM E.

• • •

EFFECT OF +GZ AND +GX ACCELERATION ON PERIPHERAL VENOUS ADH LEVELS IN HUMANS.
AD-670 923

•SEVER, RAYMOND J.

• • •

PULMONARY FUNCTION IN MAN UNDER PROLONGED ACCELERATION II. CORRELATION OF ARTERIAL BLOOD OXYGEN SATURATION WITH VENTILATION AND GAS BEING BREATHED.
AD-636 723

•SHEPLER, HERBERT G.

• • •

PILOT PERFORMANCE AND TOLERANCE STUDIES OF ORBITAL RE-ENTRY ACCELERATION.
AD-670 468

•SIPPLE, W. C.

• • •

ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION.
AD-438 495

•SMITH, ARTHUR H.

• • •

THE INFLUENCE OF CHRONIC ACCELERATION ON THE EFFECTS OF WHOLE BODY IRRADIATION IN RATS AT 760 MM OF MERCURY.
AD-663 053

•SMITH, JANICE L.

• • •

THE EFFECT OF ACCELERATIONS ON THE VESTIBULAR ANALYZER: BIBLIOGRAPHY.
AD-636 474

•SQUIRES, RUSSELL D.

• • •

ELECTROENCEPHALOGRAPHIC CHANGES IN HUMAN SUBJECTS DURING BLACKOUT PRODUCED BY POSITIVE ACCELERATION.
AD-438 495

•STASEVICH, R. S.

• • •

SPEFO, ACCELERATION, WEIGHTLESSNESS: SOME PROBLEMS IN PHYSICS AND PHYSIOLOGY IN CONNECTION WITH ATMOSPHERIC AND SPACE FLIGHTS .
AD-602 335

•STAUFFER, FLOYD R.

• • •

THE EFFECT OF HIGH ACCELERATION FORCES UPON CERTAIN PHYSIOLOGICAL FACTORS OF HUMAN SUBJECTS PLACED IN A MODIFIED SUPINE POSITION: SDC PROJECT 9-U-37A: POSITION 3.

AD-620 273

•STECH, ERNEST L.
• • •
A REVIEW OF RESTRAINT SYSTEMS TEST METHODS.
AD-618 280

•STEINMETZ, EUGENE
• • •
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT). A DESCRIPTION OF FACILITIES IN USE AND PROPOSED
AD-266 078

•STIEHM, E.R
• • •
ACCELERATION PROTECTION BY MEANS OF STIMULATION OF THE RETICULO-ENDOTHELIAL SYSTEM
AD-240 549

•STINGELY, NORMAN E
• • •
THE PHYSIOLOGICAL RESPONSES OF CHIMPANZEES TO SIMULATED LAUNCH AND RE-ENTRY ACCELERATIONS
AD-282 983

•STONE, H. L.
• • •
ABDOMINAL BLOOD FLOW CHANGES DURING ACCELERATION STRESS IN ANESTHETIZED DOGS.
AD-672 448

•STROBELE, R.
• • •
AN INEXPENSIVE VARIABLE-RADIUS CENTRIFUGE FOR PHYSIOLOGICAL EXPERIMENTS.
AD-650 331

•STURM, RALPH E.
• • •
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541

•SUTTERER, WILLIAM F
• • •
EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM
AD-245 298

•TAUB, HARVEY A.
• • •
THE EFFECTS OF VIBRATION ON DIAL READING PERFORMANCE.
AD-603 963

•TEMPLE, WILLIAM E.
• • •
MAN'S SHORT-TIME TOLERANCE TO SINUSOIDAL VIBRATION.
AD-617 011

•TORPHY, D. E.
• • •
CARDIAC ARRHYTHMIAS OCCURRING DURING ACCELERATION.
AD-643 882

•TSAKIRIS, ANASTASIO G.
• • •
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541

•URSCHEL, CHARLES W.
• • •
CARDIOVASCULAR EFFECTS OF ROTATION IN THE Z AXIS.
AD-634 090

•VAISFEL'D, I. L.
• • •
CHANGES IN THE CONTENT OF BIOLOGICALLY ACTIVE SUBSTANCES IN RATS UNDER THE ACTION OF RADIAL ACCELERATIONS.
AD-607 878

•VAN PATTEN, ROBERT E.
• • •
A RESTRAINT SYSTEM FOR APPLICATION IN RSUBZ AND -GSUBX ACCELERATION ENVIRONMENTS WITH EMPHASIS UPON KNEE AND LOWER LEG RESTRAINTS.
AD-612 957

•VON GIERKE, HENNING E
• • •
MOTION DEVICES FOR LINEAR AND ANGULAR OSCILLATION AND FOR ABRUPT ACCELERATION STUDIES ON HUMAN SUBJECTS (IMPACT). A DESCRIPTION OF FACILITIES IN USE AND PROPOSED
AD-266 078

•VON GIERKE, HENNING E.
• • •

MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.
AD-638 792

•WEIS, EDMUND B.
• • •
MECHANICAL IMPEDANCE AS A TOOL IN BIOMECHANICS.
AD-638 792

•WEIS, EDMUND B., JR
• • •
MECHANICAL IMPEDANCE AS A TOOL IN RESEARCH ON HUMAN RESPONSE TO ACCELERATION.
AD-611 946

•WEIS, EDMUND B., JR.
• • •
THE MOTION OF THE HUMAN CENTER OF MASS AND ITS RELATIONSHIP TO THE MECHANICAL IMPEDANCE.
AD-637 182

•WEIS, EDUND B., JR
• • •
COMPRESSION FRACTURES OF THORACIC VERTEBRAE APPARENTLY RESULTING FROM EXPERIMENTAL IMPACT, A CASE REPORT.
AD-622 026

•WHITE, P. D.
• • •
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•WHITE, W. J.
• • •
BIOMEDICAL POTENTIAL OF A CENTRIFUGE IN AN ORBITING LABORATORY.
AD-472 550

•WING, MORGAN E.
• • •
EFFECTS OF HIGH ACCELERATION ON VESTIBULO-OCULAR RESPONSES.
AD-A65 413

•WOLFE, JAMES W.
• • •
ADAPTATION TO PROLONGED CONSTANT ANGULAR ACCELERATION.
AD-646 178

•WOLFF, W.H
• • •
DESCRIPTION AND PERFORMANCE EVALUATION OF THE AEROSPACE MEDICAL RESEARCH LABORATORIES' VERTICAL ACCELERATOR
AD-287 996

•WOOD, EARL H
• • •
EFFECT OF HEADWARD AND FORWARD ACCELERATIONS ON THE CARDIOVASCULAR SYSTEM
AD-255 298

•WOOD, EARL H.
• • •
PHOTOELECTRIC EARPIECE RECORDINGS AND OTHER PHYSIOLOGIC VARIABLES AS OBJECTIVE METHODS OF MEASURING THE INCREASE IN TOLERANCE TO HEADWARD ACCELERATION (+GZ) PRODUCED BY PARTIAL IMMERSION IN WATER.
AD-431 208
• • •
BLOOD OXYGEN CHANGES INDUCED BY FORWARD (+GX) ACCELERATION.
AD-613 331
• • •
END-EXPIRATORY PLEURAL PRESSURES IN DOGS IN SUPINE AND PRONE BODY POSITIONS STUDIED WITHOUT THORACOTOMY.
AD-613 541

•YORK, ELIHU
• • •
HUMAN BIOCHEMICAL PARAMETERS OF ACCELERATIVE STRESS.
AD-632 817
• • •
DISTRIBUTION OF PULMONARY BLOOD FLOW AS AFFECTED BY TRANSVERSE (+GX) ACCELERATION.
AD-633 473
• • •
CATECHOL AMINE MEASUREMENTS ASSOCIATED WITH AUTONOMIC-LABYRINTHINE RESPONSES IN MAN EXPOSED TO POSITIVE (+GZ) ACCELERATION.
AD-634 519
• • •
HUMAN ACCELERATION EXPERIENCE AT THE U.S. NAVAL AIR DEVELOPMENT CENTER-JOHNSVILLE: 1 JANUARY 1961-30 DECEMBER 1969.
AD-695 496

AD-NUMBER INDEX

AD Numbers	Pages
255 298	1
257 737	2
260 549	3
262 435	4
266 076	5
266 077	6
266 078	7
268 185	8
268 791	9
268 793	10
269 488	11
269 651	12
272 352	13
282 885	14
286 930	15
287 996	16
288 979	17
420 258	18
420 284	19
424 030	20
424 922	21
426 900	22
429 027	23
430 032	24
431 208	25
438 485	26
457 349	27
472 550	28
602 210	29
602 335	30
603 012	31
603 419	32
603 963	33
607 878	34
608 570	35
608 571	36
610 132	37
611 946	38
612 957	39
613 331	40
613 541	41
615 374	42
615 570	43
617 011	44
617 752	45
618 280	46
618 416	47
620 273	48
620 298	49
620 319	50
622 026	51
624 487	52
624 546	53
624 826	54
625 254	55
627 430	56
630 788	57
630 991	58
632 681	59
632 817	60
633 473	61
633 705	62
634 080	63
634 519	64
634 609	65
635 719	66
636 474	67
636 723	68
637 182	69
637 184	70
638 719	71
638 792	72
641 418	73
643 882	74
644 003	75
647 311	76
649 545	77
649 615	78
650 331	79
650 481	80
651 067	81
655 436	82
657 417	83
660 257	84
663 053	85
663 197	86
664 211	87
664 553	88
665 413	89
665 849	90
666 178	91
666 379	92

AD Numbers	Page
669 017	93
670 468	94
670 823	95
671 855	96
672 446	97
672 448	98
672 927	99

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