53

AD-A041 400

DDC/BIB-77/06

ENVIRONMENTAL POLLUTION
NOISE POLLUTION
SONIC BOOM
A DDC BIBLIOGRAPHY

DDC-TAS
Cameron Station
Alexandria, Va. 22314

JUNE 1977

DEFENSE DOCUMENTATION CENTER
DEFENSE LOGISTICS AGENCY
Cameron Station
Alexandria, Va. 22314

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

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*Bibliographies	Psychoacoustics
*Sonic Boom	Meteorological Phenomena
*Noise Pollution	Law (Jurisprudence)
Jet Transport Planes	Public Opinion
Supersonic Aircraft	Abstracts

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This bibliography contains citations of studies and analyses covering a wide range of the parameter of sonic boom and noise pollution, as well as damages caused by it. Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

(#19 Continued)

Shock Waves
Jet Plane Noise
Jet Aircraft
Aircraft Noise
Psysiological Effects
Reaction (Psychology)

F O R E W O R D

This bibliography consists of 156 selected unclassified and unlimited citations of reports on *Noise Pollution - Sonic Boom*.

These citations are studies and analyses covering a wide range of the parameter of sonic boom and noise pollution, as well as damages caused by it.

References were taken from entries processed into the Defense Documentation Center's AD data bank during the period of January 1953 to March 1977.

This bibliography supersedes DDC report bibliography on *Environmental Pollution: Noise Pollution - Sonic Boom* AD-769 970, DDC-TAS-73-74, dated November 1973.

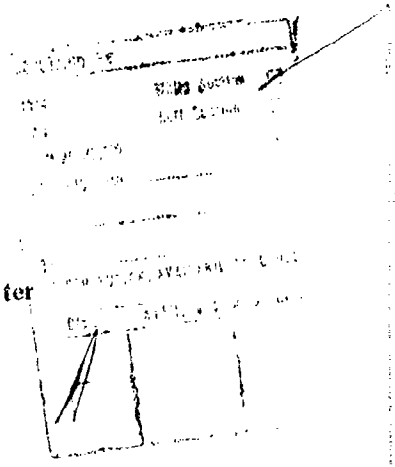
Individual entries are arranged in AD number sequence under the heading AD Bibliographic References. Computer generated indexes of Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.

BY ORDER OF THE DIRECTOR, DEFENSE LOGISTICS AGENCY

OFFICIAL

Hubert E. Sauter

HUBERT E. SAUTER
Administrator
Defense Documentation Center



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 229 463
ARDE-PORTLAND INC NEWARK N J

RESPONSE OF STRUCTURES TO AIRCRAFT GENERATED SHOCK WAVES (U)

APR 59 138P
CONTRACT: AF33 616 5197
MONITOR: WADC TR-58-169

UNCLASSIFIED REPORT

DESCRIPTORS: *SHOCK WAVES, *STRUCTURES, *TRANSONIC CHARACTERISTICS, FAILURE (MECHANICS), HOUSING(DWELLINGS), INSTALLATION, JET PLANE NOISE, PRESSURE, SONIC BOOM (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 260 635
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

GROUND MEASUREMENTS OF THE SHOCK-WAVE NOISE FROM SUPERSONIC BOMBER AIRPLANES IN THE ALTITUDE RANGE FROM 30,000 TO 50,000 FEET (U)

JUL 61 1V MAGLIERI,DOMENIC J.;HUBBARD,HARVEY H.;

REPT. NO. TN D 880

UNCLASSIFIED REPORT

DESCRIPTORS: *JET BOMBERS, *LIFT, *SHOCK WAVES, *SUPERSONIC AIRCRAFT, AERODYNAMIC CHARACTERISTICS, BOMBER AIRCRAFT, GAS FLOW, MEASUREMENT, PRESSURE, TRANSONIC CHARACTERISTICS (U)

SHOCK-WAVE GROUND-PRESSURE MEASUREMENTS HAVE BEEN MADE FOR SUPERSONIC BOMBER AIRPLANES IN THE MACH NUMBER RANGE FROM 1.24 TO 1.52, FOR ALTITUDES FROM ABOUT 30,000 TO 50,000 FEET, AND FOR A GROSS-WEIGHT RANGE FROM ABOUT 83,000 TO 120,000 POUNDS. THE MEASURED OVERPRESSURES WERE GENERALLY HIGHER THAN WOULD BE PREDICTED BY THE THEORY WHICH ACCOUNTS ONLY FOR VOLUME EFFECTS. THERE IS THUS A SUGGESTION THAT LIFT EFFECTS ON SONIC-BOOM INTEN ITY MAY BE SIGNIFICANT OR THIS TYPE OF AIRPLANE FOR THE ALTITUDE RANGE OF THE PRESENT TESTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 260 636
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C.

AN INVESTIGATION OF THE INFLUENCE OF LIFT ON SONIC-BOOM INTENSITY BY MEANS OF WIND-TUNNEL MEASUREMENTS OF THE PRESSURE FIELDS OF SEVERAL WING-BODY COMBINATIONS AT A MACH NUMBER OF 2.01 (U)

JUL 61 IV CARLSON,HARRY W.;
REPT. NO. TN D 881

UNCLASSIFIED REPORT

DESCRIPTORS: *LIFT, *SHOCK WAVES, *SOUND, *SUPERSONIC FLOW, *WING BODY CONFIGURATIONS, ACOUSTICS, AERODYNAMIC CHARACTERISTICS, AMPLIFIERS, PRESSURE, SONIC BOOM, WIND TUNNELS (U)

AN INVESTIGATION OF THE EFFECT OF LIFT ON SONICBOOM INTENSITY WAS PERFORMED BY MEANS OF WINDTUNNEL MEASUREMENTS OF THE PRESSURE FIELDS SURROUNDING SMALL WING-BODY COMBINATIONS. EFFECTS OF LIFT WERE FOUND TO BE REAL AND SIGNIFICANT. MEASURED BOW-SHOCK INTENSITIES AGREED FAIRLY WELL WITH, BUT WERE CONSISTENTLY LESS THAN, SHOCK INTENSITIES ESTIMATED BY THEORETICAL METHODS. AVAILABLE FLIGHT DATA WERE EXAMINED FOR CORRELATION WITH WIND-TUNNEL TEST RESULTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 292 658
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

FLIGHT - EXPLOSION (U)

NOV 62 1V YUR'YEV,L.;
REPT. NO. TT 62 98

UNCLASSIFIED REPORT

DESCRIPTORS: *BLUNT BODIES, AERODYNAMIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, ATMOSPHERE ENTRY, SHOCK WAVES, SONIC BOOM, SPIKES, SUPERSONIC FLOW, SWEPTBACK WINGS (U)

A STUDY WAS MADE OF A NEW METHOD OF STUDY AND CALCULATION OF THE MOTION OF SLENDER, BLUNT-FACED BODIES THROUGH AIR AND THE PROPAGATION OF EXPLOSIVE WAVES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 404 562
FEDERAL AVIATION AGENCY WASHINGTON D C

COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT RESEARCH PROGRAM. SELECTED REFERENCES. (U)

APR 63 38P
MONITOR: FAA BLB

UNCLASSIFIED REPORT

DESCRIPTORS: *TRANSPORT AIRCRAFT, *SUPERSONIC, *AIRFRAMES, *FLIGHT CONTROL SYSTEMS, *BIBLIOGRAPHIES, JET ENGINES, SONIC BOOM, SIMULATION, LUBRICATION, JET ENGINE FUELS, MATERIALS, DYNAMICS, METALS, JET PROPULSION, AIRCRAFT, STRUCTURAL PROPERTIES. (U)

BIBLIOGRAPHIES IN REFERENCE TO COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 408 716
ARMY SIGNAL RADIO PROPAGATION AGENCY WHITE SANDS MISSILE RANGE N MEX

PROCEEDINGS OF THE SYMPOSIUM ON ATMOSPHERIC ACOUSTIC PROPAGATION, 14-16 JUNE, 1961, TEXAS WESTERN COLLEGE AND FORT BLISS, EL PASO, TEXAS. VOLUME I. (U)

AUG 61 268P

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACOUSTICS, SYMPOSIA), (*PROPA, ATMOSPHERES), SHOCK WAVES, FLIGHT PATHS, NOMOGRAPHS, ABSORPTION, BALLISTICS, DETERMINA, MICROPHONES, ACOUSTIC PROPERTIES, CON, THEORY, DATA, GEOMETRY, BLAST, NOISE, WAVE PROPAGATION, ELECTROMAGNETIC, SONIC BOOM, DETONATION WAVES, METEOROLOG, GUIDED MISSILES, WIND, TEMPERA, CAPACITORS, TELEMETER, CORRECTIONS, ARTILLERY FIRE, DATA, BACKGROUND, ANALYSIS, EXPLOSIONS. (U)

SYMPOSIA ON ATMOSPHERIC ACOUSTIC PROPAGATION.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 422 294
AEROSPACE CORP EL SEGUNDO CALIF

NOTES ON THE DIFFRACTION OF BLASTS BY FLYING VEHICLES. PART ONE: GENERAL COMMENTS PART TWO: BLAST-WAVE, MACH-WAVE INTERACTION, (U)

AUG 63 1P MILES,J. W. ;
REPT. NO. TDR269 4230 30 1
CONTRACT: AF04 695 269
MONITOR: SSD TDR63 195

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*AIRFOILS, BLAST), (*SHOCK WAVES, DIFFRACTION), SUPERSONIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, WEDGES, SUPERSONIC FLOW, MATHEMATICAL ANALYSIS, SUPERSONIC AIRFOILS, MATRICES(MATHEMATICS), INTERFERENCE, SONIC BOOM, AERODYNAMIC LOADING (U)

WHITHAM'S TECHNIQUE FOR THE APPROXIMATE CALCULATION OF THE DIFFRACTION OF SHOCK WAVES BY STATIONARY BODIES IS APPLIED TO THE DIFFRACTION OF A BLAST WAVE BY A MACH WAVE THAT EMANATES FROM THE APEX OF A THIN WEDGE IN SUPERSONIC FLIGHT. THE APPROXIMATE RESULTS TEND TO THE EXACT RESULTS FOR WEAK BLAST WAVES BUT ARE UNSATISFACTORY FOR VERY STRONG BLAST WAVES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 447 717
FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM BIBLIOGRAPHY, (U)

SEP 64 11P FRIEDMAN,ROBERT K. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SONIC BOOM, BIBLIOGRAPHIES), (*BIBLIOGRAPHIES, SONIC BOOM), URBAN AREAS, ATTITUDES(PSYCHOLOGY), SUPERSONIC FLIGHT, TRANSPORT AIRCRAFT (U)

THIS BIBLIOGRAPHY ON SONIC BOOM HAS BEEN COMPILED IN RESPONSE TO A SPECIFIC REQUEST. NO CLAIM IS MADE THAT THESE 193 CITATIONS COMPRISE AN EXHAUSTIVE OR CRITICAL COMPILATION. THE INCLUSION OF ANY REFERENCE TO MATERIAL IS NOT TO BE CONSTRUED AS AN ENDORSEMENT OF THE INFORMATION CONTAINED IN THAT MATERIAL. THE REFERENCE SEARCH WAS COMPLETED AUGUST 28, 1964. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 464 647
LIBRARY OF CONGRESS WASHINGTON D C AEROSPACE TECHNOLOGY DIV

DATA ON SOVIET SPACE PROGRAM. (U)

DESCRIPTIVE NOTE: ANALYTICAL SURVEY OF SOVIET-BLOC SCIENTIFIC AND TECHNICAL LITERATURE.
JUN 65 16P
REPT. NO. ATD-P-65-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ASTRONAUTICS, USSR), (*AERONAUTICS, USSR), SPACE BIOLOGY, SUPERSONIC AIRCRAFT, HYPERSONIC AIRCRAFT, SONIC BOOM, JET TRANSPORT PLANES, SPACECRAFT, LUNAR CRAFT, MANNED SPACECRAFT, ADJUSTMENT(PSYCHOLOGY), SPACE ENVIRONMENTS, CONFINED ENVIRONMENTS, PHYSIOLOGY, MEASUREMENT, WEIGHTLESSNESS, SPACE CAPSULES (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS, VOSKHOD (U)

CONTENTS: SPACE BIOLOGY; SUPERSONIC AIRCRAFT; HYPERSONIC AIRCRAFT; THE SONIC BOOM; SOVIET OFFICIALS ON SST; THE VOSKHOD SPACECRAFT; SOVIET EXPLORATION OF THE MOON. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUMU9

AD- 468 794
FEDERAL AVIATION AGENCY WASHINGTON D C

EFFECT OF SONIC BOOMS OF VARYING OVERPRESSURES ON SNOW AVALANCHES. (U)

65 33P
REPT. NO. SST-65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH FOREST SERVICE, WASHINGTON, D. C., DEPARTMENT OF THE AIR FORCE, WASHINGTON, D. C. AND NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.

DESCRIPTORS: (*SONIC BOOM, AVALANCHES), (*AVALANCHES, SONIC BOOM), SNOW, PRESSURE, SUPERSONIC AIRCRAFT, HAZARDS, COLORADO, NOISE, JET FIGHTERS (U)
IDENTIFIERS: F-100 AIRCRAFT, F-104 AIRCRAFT, OVERPRESSURE (U)

ON 18 - 20 MARCH 1965, A SONIC BOOM PROGRAM WAS CONDUCTED IN THE STAR MOUNTAIN AREA NEAR LEADVILLE, COLORADO, IN THE SAN ISABEL NATIONAL FOREST. OBJECTIVE WAS TO DETERMINE THE EFFECTS OF SONIC BOOM OVERPRESSURES ON SNOW AVALANCHES. A TOTAL OF 18 COMBINED F-104 AND F-100 RUNS WERE MADE WITH OVERPRESSURES RANGING FROM 1.5 TO 5.2 MEASURED. NO AVALANCHE WAS OBSERVED AS A DIRECT RESULT OF THE SONIC BOOMS. FOREST SERVICE PERSONNEL RATED THE AVALANCHE HAZARD AS 'LOW' DURING THE TEST PERIOD, RESULTING IN THE RECOMMENDATION FOR FURTHER TESTS DURING PERIODS OF 'HIGH' AVALANCHE HAZARD. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 474 778 20/1
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH DIV

REPORT ON THE NATIONAL SONIC BOOM STUDY STRUCTURAL REACTION PROGRAM. SUMMARY, CONCLUSIONS, AND ANALYSIS. VOLUME 1. (U)

APR 65 179P
CONTRACT: FA-SS-65-12
MONITOR: FAA-SST 65-15-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-474 779L.

DESCRIPTORS: (*SONIC BOOM, *BUILDINGS), TEST METHODS, STATE-OF-THE-ART REVIEWS, DESIGN, NEW MEXICO, DAMAGE, PRESSURE, WALLS, FRACTURE(MECHANICS), FOUNDATIONS(STRUCTURES), CONSTRUCTION, METEOROLOGICAL PHENOMENA, JET FIGHTERS, JET BOMBERS, BRICK, WOOD, PREFABRICATED BUILDINGS, JET TRANSPORT PLANES, SUPERSONIC AIRCRAFT, LOADS(FORCES), CONCRETE, GLASS, STRUCTURAL MEMBERS, SHOCK WAVES, STRUCTURES (U)
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, SUPERSONIC TRANSPORTS (U)

CONTENTS: SURVEY OF LITERATURE -- SONIC BOOM, AIR BLAST AND RELATED PHENOMENA, GENERAL BEHAVIOR OF STRUCTURAL ELEMENTS UNDER STATIC AND DYNAMIC LOADS, CROSS SECTIONAL SURVEY OF HOUSE TYPES IN THE UNITED STATES, NATURAL LOADING CONDITIONS THROUGHOUT THE UNITED STATES, BUILDING CODES; TEST PLAN -- SITE SELECTION, DESIGN OF NEW TEST STRUCTURES, STRUCTURAL MODULES, PREFAB, STPREFRONT AND GREENHOUSE, EXISTING STRUCTURES OBSERVED IN TEST, DAMAGE OBSERVATION PLAN, INSTRUMENTATION, DATA REDUCTION AND ANALYSIS; SPECIAL TESTS -- MATERIAL TESTS, FOUNDATION MATERIALS EVALUATION, LOAD-DEFLECTION AND ''TWANG'' TESTS; OBSERVED STRUCTURAL BEHAVIOR -- LOADING CONDITIONS, PARAMETERS, PLASTER ON WOOD LATH, PLASTER ON GYPLATH; METAL LATH AND CONCRETE BLOCK, GYPBOARD, BATHROOM TILE, GLASS, STUCCO, CONCRETE BLOCK, BRICK, BRIC-A-BRAC; ANALYSIS OF STRUCTURAL BEHAVIOR -- LOAD MODIFICATION STUDIES, STRUCTURAL RESPONSE, (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUMU9

AD- 474 779 20/1
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH DIV

STRUCTURAL REACTION PROGRAM. NATIONAL SONIC BOOM STUDY PROFECT. VOLUME 2. (U)

APR 65 234P
CONTRACT: FA-SS-65-12
MONITOR: FAA-SST 65-15-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-474 778L.

DESCRIPTORS: (*SONIC BOOM, *BUILDINGS), DESIGN, SPECIFICATIONS, NEW MEXICO, BIBLIOGRAPHIES, PRESSURE, JET FIGHTERS, JET BOMBERS, TABLES(DATA), DAMAGE, SHOCK WAVES, STRUCTURAL MEMBERS, JET TRANSPORT PLANES, SUPERSONIC AIRCRAFT, PREFABRICATED BUILDINGS, STRUCTURES (U)
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, SUPERSONIC TRANSPORTS (U)

THE TWO VOLUMES OF THIS REPORT DESCRIBES THE RESULTS OF THE NATIONAL SONIC BOOM STRUCTURAL RESPONSE STUDY CONDUCTED AT THE WHITE SANDS MISSILE RANGE, WHITE SANDS, N.M. IT IS ONE OF THE ONGOINING SERIES OF SONIC BOOM RESEARCH PROGRAMS CONDUCTED BY THE GOVERNMENT IN THE SUPERSONIC TRANSPORT DEVELOPMENT PROGRAM. THE PRIMARY OBJECTIVE WAS DETERMINATION OF SONIC BOOM OVERPRESSURE DAMAGE INDEX LEVELS ASSOCIATED WITH VARIOUS TYPES OF STRUCTURAL MATERIAL SUCH AS PLASTER, GLASS AND MASONRY. THE TEST AREA INCLUDED 21 STRUCTURES VARYING IN DESIGN, CONSTRUCTION AND AGE. FURNITURE, MIRRORS, TELEVISION SETS AND OTHER HOME APPLIANCES, DISHES, CRYSTAL, BRIC-A-BRAC AND VARIOUS OTHER ITEMS WERE IN THE TEST STRUCTURES. THE TEST SITE WAS EXPOSED TO 1494 SONIC BOOMS OF OVERPRESSURES RANGING FROM 1.6 TO 23.4 POUNDS PER SQUARE FOOT (P.S.F.). SONIC BOOMS AND STRUCTURAL MATERIAL REACTION WERE MEASURED. TO STUDY THE CUMULATIVE EFFECTS OF REPEATED SONIC BOOMS, 680 SUCCESSIVE FLIGHTS AT A SCHEDULED OVERPRESSURE OF 5.0 P.S.F. IT IS CONCLUDED THAT NO PREVIOUSLY UNDAMAGED MATERIAL WAS IDENTIFIED DURING THE ACCUMULATIVE EFFECTS PORTION OF THE STUDY. SONIC BOOM OVERPRESSURE LEVELS AT WHICH INCIEIENT EFFECTS APPEAR IN STRUCTURES AND MATERIALS ARE PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 475 662 20/1 13/13
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH DIV

THE EFFECTS OF SONIC BOOM ON STRUCTURAL BEHAVIOR. A SUPPLEMENTARY ANALYSIS REPORT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 65 192P WIGGINS,JOHN H. ,JR.;
CONTRACT: FA-SS-65-12
MONITOR: FAA-SST 65-18

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *BUILDINGS), RESPONSE, DAMAGE, OKLAHOMA, NEW MEXICO, SHOCK WAVES, STATISTICAL DISTRIBUTIONS, STATISTICAL ANALYSIS, DAMAGE ASSESSMENT, LOADS(FORCES), INTENSITY, REFLECTION, PRESSURE, MATHEMATICAL PREDICTION, STRUCTURES, RESONANT FREQUENCY, DAMPING, RESONANCE, WALLS, SOILS, ALTITUDE, TIME, THEORY, VIBRATION, STRESSES, DEFLECTION, GLASS, STRUCTURAL PROPERTIES, FRACTURE(MECHANICS), METEOROLOGICAL PHENOMENA, JET FIGHTERS, JET BOMBERS (U)
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, F-106 AIRCRAFT (U)

RESPONSE AND DAMAGE DATA FROM THE FEDERAL AVIATION AGENCY SONIC BOOM TESTS AT OKLAHOMA CITY, OKLAHOMA, AND WHITE SANDS, NEW MEXICO, ARE ANALYZED AND EFFECTS ON STRUCTURES SUMMARIZED. PARAMETERS GOVERNING THE FREE-FIELD AND NEAR-FIELD BOOM WAVES ARE ALSO STUDIED AND THEIR INFLUENCE ON SCATTER IN THE DATA ESTIMATED STATISTICALLY. THIS REPORT THEN CONSERVATIVELY SUMMARIZES THE RESULTS IN A DAMAGE PREDICTION TABLE AND CHART. INSURANCE ADJUSTERS ARE GIVEN GUIDANCE ON THE TREATMENT OF SONIC BOOM DAMAGE CLAIMS ALONG WITH THE CHART. FINALLY, RECOMMENDATIONS FOR FUTURE WORK IN SONIC BOOM, STRUCTURAL BEHAVIOR STUDIES ARE MADE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 479 366 20/1 4/2 1/1
WEATHER WING (6TH) ANDREWS AFB WASHINGTON D C

SONIC BOOM. (U)

FEB 66 43P
REPT. NO. 6WWP-105-1-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES REPT. NO. 4WGP-105-1-1 DATED 1 JUL 60.

DESCRIPTORS: (*SONIC BOOM, *METEOROLOGICAL PHENOMENA), MEASUREMENT, SOUND, PROPAGATION, ATMOSPHERES, SUPERSONIC FLIGHT, PRESSURE, SHOCK WAVES, MATHEMATICAL ANALYSIS, VELOCITY, FLIGHT PATHS, TRAJECTORIES, TROPOSPHERE, WIND, ATMOSPHERIC TEMPERATURE, TNT, TEST METHODS, SUPERSONIC WIND TUNNELS, BOMBER AIRCRAFT, FIGHTER AIRCRAFT, AIRPLANE MODELS, ROCKETS, LAUNCH VEHICLES, NOISE, SUPERSONIC CHARACTERISTICS, SOUND TRANSMISSION (U)
IDENTIFIERS: SATURN LAUNCH VEHICLES (U)

BECAUSE THERE ARE IMPORTANT METEOROLOGICAL EFFECTS ON SHOCK WAVE PROPAGATION, WEATHER OFFICERS SHOULD BECOME ACQUAINTED WITH SOME OF THE TERMINOLOGY AND THE PHYSICAL PRINCIPLES OF WEATHER EFFECTS ON SONIC BOOM PROPAGATION. CALCULATION OF SHOCK WAVE PATTERNS COVERING MANY SQUARE MILES IS AN EXCEEDINGLY COMPLEX OPERATION WHICH INVOLVES SEVERAL PARAMETERS OTHER THAN WEATHER DATA. SONIC BOOMS CAUSED BY EITHER AIRCRAFT OR MISSILES ARE INFLUENCED BY SIZE, SHAPE, SPEED, TRAJECTORY, ETC. THE USE OF EQUATIONS TO COMBINE THE EFFECTS OF SUCH A LARGE NUMBER OF VARIABLES CAN ONLY GIVE RESULTS IN TERMS OF SIMPLIFIED CONDITIONS. ACTUAL MEASUREMENTS MADE IN FIELD TESTS SHOW A RATHER BROAD RANGE OF VALUES SURROUNDING THOSE DERIVED FROM MATHEMATICAL CALCULATION. IN THIS REPORT, NO ATTEMPT WILL BE MADE TO PRESENT THE MATHEMATICAL TREATMENTS REQUIRED BY THOSE WHO CALCULATE EXPECTED SONIC BOOMS WITH THE AID OF ELECTRONIC COMPUTERS. CURRENT KNOWLEDGE OF THE EFFECT OF WEATHER PARAMETERS ON SONIC BOOM HAS BEEN GAINED PRIMARILY FROM LIMITED ATMOSPHERIC MEASUREMENT MADE NEAR THE TIME AND LOCATION OF PLANNED SONIC BOOM TESTS. METEOROLOGISTS ARE BEING ASKED TO EXAMINE AND HELP EXPLAIN THE RATHER WIDE VARIABILITY IN THE OBSERVED SONIC BOOM PRESSURES BEING MEASURED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 601 688
FEDERAL AVIATION AGENCY WASHINGTON D C

SUPERSONIC TRANSPORT DEVELOPMENT PROGRAM. (U)

JUN 63 67P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, AIR TRANSPORTATION), (*COMMERCIAL PLANES, AIR TRANSPORTATION PRODUCTION), DESIGN, ECONOMICS, COSTS, COMMERCE, SPEED, SONIC BOOM, ALUMINUM, STEEL, TITANIUM, MONEY, MANAGEMENT ENGINEERING, PERSONNEL, AIRFRAMES, JET ENGINES, PAY LOAD (U)

THIS REPORT DESCRIBES THE PROGRAM FOR THE DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT AS APPROVED BY THE PRESIDENT. TOPICS INCLUDE SUPERSONIC TRANSPORT AND THE NATIONAL INTEREST, FOREIGN COMPETITION, MARKET POTENTIAL FOR THE SUPERSONIC TRANSPORT, DESIGN CONSIDERATIONS FOR A UNITED STATES SUPERSONIC TRANSPORT, FACTORS INFLUENCING DESIGN SPEED, SONIC BOOM, SUPERSONIC TRANSPORT OPERATING ECONOMICS, DEVELOPMENT PROGRAM, PRODUCTION PROGRAM, ESCALATION OF DEVELOPMENT AND PRODUCTION COSTS, OTHER TECHNICAL CONSIDERATIONS, MANAGEMENT ORGANIZATION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 602 173
FEDERAL AVIATION AGENCY WASHINGTON D C

SOME CONSIDERATIONS OF SONIC BOOM. (U)

DESCRIPTIVE NOTE: SUMMARY REPT.,
MAY 61 29P POWER,J. KENNETH ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SONIC BOOM, THEORY), JET PLANE NOISE, LIFT, VOLUME, SHOCK WAVES, PRESSURE, SUPERSONIC AIRCRAFT, PRESSURE, ATMOSPHERIC TEMPERATURE, EQUATIONS, FLUID DYNAMICS, PUBLIC RELATIONS, FLIGHT TESTING (U)
IDENTIFIERS: OVERPRESSURE (U)

CONTENTS: BASIC PHENOMENA DISCUSSION, THEORETICAL CONSIDERATIONS, LIFTING EFFECTS, FLIGHT TEST--COMPARISON WITH THEORY, GENERAL CONSIDERATIONS OF NOISE, SONIC BOOM--POINT SOURCE EXPLOSIONS, PREDICTION OF EFFECTS OF SONIC BOOM OVERPRESSURES, SHOCK WAVE NOISE PROBLEMS OF FUTURE SUPERSONIC TRANSPORT AIRCRAFT, AVAILABLE REFERENCES ON SONIC BOOM. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD= 602 175
FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM EFFECTS ON LIGHT AIRCRAFT HELICOPTERS AND GROUND STRUCTURES. (U)

DESCRIPTIVE NOTE: REPT. FOR 3 FEB-10 APR 64,
JUN 64 44P POWER,JOSEPH KENNETH ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: FOR PRESENTATION TO THE AMERICAN SOCIETY FOR TESTING AND MATERIALS, CHICAGO, ILL., JUNE 25, 1964.

DESCRIPTORS: (*SONIC BOOM, DAMAGE), METEOROLOGICAL PHENOMENA, SOUND, SHOCK WAVES, PRESSURE, HELICOPTERS, AIRCRAFT, TESTS, HOUSING(DWELLINGS) (U)
IDENTIFIERS: OVERPRESSURE (U)

SONIC BOOM EFFECTS ON LIGHT AIRCRAFT HELICOPTERS AND GROUND STRUCTURES.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 602 176
FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM AND COMMUNITY RELATIONS, (U)

APR 64 40P POWER,J. K. ;BATES ,GEORGE ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE NATIONAL AERONAUTICAL MEETING, WASHINGTON, D. C. APRIL 8-11, 1963. SOCIETY OF AUTOMOTIVE ENGINEERS, INC., PAPER NO. 683B

DESCRIPTORS: (*SONIC BOOM, DAMAGE), SUPERSONIC FLIGHT, HUMANS, SUPERSONIC AIRCRAFT, LIFT, VOLUME, SHOCK WAVES, METEOROLOGICAL PHENOMENA, PRESSURE, DESIGN, SOUND, COMMERCIAL PLANES, PUBLIC OPINION (U)

SOME PRELIMINARY ACCOMPLISHMENTS OF SONIC BOOM RESEARCH IN PREDICTING STRENGTH AND LOCATION OF SONIC BOOM SHOCK WAVES, DETERMINING THE EFFECTS ON LIGHT AIRCRAFT, AND EVALUATING COMMUNITY TOLERANCE TO VARIOUS LEVELS OF SONIC BOOM INTENSITY ARE REVIEWED. A BRIEF SUMMARY OF THE IMPLICATIONS OF SONIC BOOM WITH REGARD TO SUPERSONIC TRANSPORT DESIGN IS INCLUDED. (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 610 463
BOEING CO RENTON WASH AIRPLANE DIV

METEOROLOGICAL ASPECTS OF THE SONIC BOOM. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 64 143P KANE,EDWARD J. ;PALMER,
THOMAS Y. ;
CONTRACT: FA WA4717
PROJ: 206 003R
MONITOR: FAA , RD64 160

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SONIC BOOM, METEOROLOGICAL PHENOMENA), (*METEOROLOGICAL PHENOMENA, SONIC BOOM), (*LEVEL FLIGHT, SONIC BOOM), ATMOSPHERES, METEOROLOGICAL PHENOMENA, ATMOSPHERIC TEMPERATURE, PRESSURE, WIND, TURBULENCE, SUPERSONIC FLIGHT, SHOCK WAVES, PROPAGATION, OKLAHOMA, FOCUSING (U)
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, F-101 AIRCRAFT (U)

THIS REPORT IS A STUDY OF THE EFFECT OF CHANGING METEORO LOGICAL CONDITIONS ON THE SONIC BOOM PRODUCED DURING STEADY LEVEL FLIGHT. THE INFLUENCE OF VARIATIONS IN ATMOSPHERIC TEMPERATURE, PRESSURE, AND WIND ON THIS NOISE ARE INVESTIGATED. SIMPLIFIED METHODS ARE ESTABLISHED FOR ESTIMATING THE EFFECT OF THESE VARIATIONS. COMBINATIONS OF METEOROLOGICAL CONDITIONS WHICH CAN PRODUCE ANOMALOUS PROPAGATION SUCH AS COMPLETE CUT-OFF, FOCUSING, AND EXTREME LATERAL SPREAD ARE DISCUSSED. THE EFFECT OF AIR TURBULENCE NEAR THE GROUND IS CONSIDERED. A NUMBER OF COMPARISONS WITH TEST DATA MEASURED AT OKLAHOMA CITY (1964) ARE PRESENTED, AND RECOMMENDATIONS FOR ADDITIONAL EXPERIMENTAL AND THEORETICAL WORK ARE OUTLINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 610 822
ANDREWS ASSOCIATES INC OKLAHOMA CITY OKLA

STRUCTURAL RESPONSE TO SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. I.
FEB 65 240P
CONTRACT: FA64AC6 526
MONITOR: FAA-SST 65-1-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH HUDGINS, THOMPSON, BALL AND ASSOCIATES, INC., OKLAHOMA CITY, OKLA.

DESCRIPTORS: (*SONIC BOOM, DAMAGE), (*HOUSING(DWELLINGS), SONIC BOOM), BUILDINGS, STRUCTURAL MEMBERS, STRESSES, DEGRADATION, FRACTURE (MECHANICS), SHOCK WAVES, STRAIN (MECHANICS), AIRCRAFT, FINISHES AND FINISHING, URBAN AREAS, OKLAHOMA, FLIGHT PATHS, PRESSURE, TESTS (U)

THE REPORT DOCUMENTS AND REPORTS ON THE RESULTS OF THE STRUCTURAL RESPONSE OF SOME RESIDENTIAL STRUCTURES IN THE OKLAHOMA CITY AREA DURING A 39-WEEK TESTING PROGRAM CONSISTING OF TWENTY-SIX WEEKS OF EIGHT DAILY, CONTROLLED SONIC BOOMS, FOLLOWED BY THIRTEEN WEEKS OF OBSERVATION AND INSPECTION OF THE STRUCTURES TO DETERMINE THE RATE OF NORMAL DETERIORATION AS COMPARED TO THE RATE OF DETERIORATION FOUND DURING THE 26-WEEK SONIC BOOM PERIOD. THE TEST STRUCTURES CONSISTED OF A TOTAL OF ELEVEN TYPICAL TYPES OF RESIDENTIAL STRUCTURES, EIGHT OF WHICH WERE LOCATED WITHIN FIVE MILES OF THE REGULAR FLIGHT PATH, ONE OF WHICH WAS LOCATED TEN MILES FROM THE FLIGHT PATH, AND THE REMAINING TWO LOCATED ABOUT TWENTY-FIVE MILES FROM THE FLIGHT PATH AT NORMAN, OKLAHOMA WHICH WAS BEYOND THE SONIC BOOM AREA. CONCLUSIVE EVIDENCE OF SIGNIFICANT DAMAGE TO THE TEST STRUCTURES WAS NOT PRODUCED BY THIS INVESTIGATION. HOWEVER, A SIGNIFICANT INCREASE IN OCCURRENCE OF MINOR PAINT CRACKING OVER NAIL HEADS AND IN CORNERS OF THE WALLBOARD INTERIORS OF TWO OF THE TEST STRUCTURES DURING THE SONIC BOOM PERIOD SUGGESTS THAT SONIC BOOMS ACCELERATED THIS RATHER MINOR DETERIORATION. NO INCREASE OCCURRED IN THE RATE AT WHICH PAINT FINISH ON LATH AND PLASTER WALL INTERIORS CRACKED DURING THE SONIC BOOM PERIOD. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 610 823
ANDREWS ASSOCIATES INC OKLAHOMA CITY OKLA

STRUCTURAL RESPONSE TO SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 2, APP.
FEB 65 181P
CONTRACT: FA64AC6 526
MONITOR: FAA-SST 65-1-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH HUDGINS, THOMPSON, BALL AND ASSOCIATES, INC., OKLAHOMA CITY, OKLA.

DESCRIPTORS: (*SONIC BOOM, DAMAGE), (*HOUSING(DWELLINGS), SONIC BOOM), BUILDINGS, STRUCTURAL MEMBERS, STRESSES, DEGRADATION, FRACTURE (MECHANICS), SHOCK WAVES, STRAIN (MECHANICS), SUPERSONIC AIRCRAFT, EXPERIMENTAL DATA, MECHANICAL DRAWINGS, URBAN AREAS, OKLAHOMA, FLIGHT PATHS, PRESSURE (U)

THE VOLUME CONSISTS OF APPENDICES TO AD-610 822. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO9

AD- 613 620
NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR APR 63-FEB 65,
FEB 65 61P BORSKY,PAUL N. ;
REPT. NO. 101
CONTRACT: AF33 657 11148
PROJ: 7231
TASK: 723103
MONITOR: AMRL , TR-65-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SONIC BOOM, OKLAHOMA), (*REACTION (PSYCHOLOGY), SONIC BOOM), (*AIR TRANSPORTATION, OKLAHOMA), SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT, PUBLIC OPINION, ACOUSTICS (U)

THE OKLAHOMA CITY, OKLAHOMA, AREA WAS REPEATEDLY EXPOSED TO SONIC BOOMS GENERATED BY A SIMULATED SCHEDULE OF SUPERSONIC TRANSPORT OVERFLIGHTS DURING A PERIOD OF 6 MONTHS FROM FEBRUARY TO JULY 1964. THE SCHEDULE PROVIDED FOR EIGHT SONIC BOOMS PER DAY PROGRAMED AT AN INTENSITY OF 1.5 POUNDS PER SQUARE FOOT (PSF) DURING THE FIRST PORTION OF THE STUDY AND 2.0 PSF DURING THE LATTER STAGES. ALMOST 3000 LOCAL RESIDENTS WERE PERSONALLY INTERVIEWED THREE TIMES DURING THE 6-MONTH PERIOD TO DETERMINE THE NATURE AND EXTENT OF THEIR REACTIONS TO THE SONIC BOOMS. AMONG THE FINDINGS IT WAS SHOWN THAT SUBSTANTIAL NUMBERS OF RESIDENTS REPORTED INTERRUPTIONS OF ORDINARY LIVING ACTIVITIES, AND SOME ANNOYANCE WITH THESE INTERRUPTIONS, HOWEVER, THE OVERWHELMING MAJORITY FELT THEY COULD LEARN TO LIVE WITH THE NUMBERS AND KINDS OF BOOMS EXPERIENCED DURING THE 6-MONTH STUDY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 618 770
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

HUMAN RESPONSES TO SONIC BOOM, (U)

MAY 65 11P NIXON,CHARLES W. ;
REPT. NO. AMRL-TR-65-9
PROJ: 7231
TASK: 723103

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AEROSPACE MEDICINE V36 N5 P399-405 MAY 1965 (COPIES NOT AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*SONIC BOOM, REACTION(PSYCHOLOGY)), JET PLANE NOISE, SHOCK WAVES, SUPERSONIC CHARACTERISTICS, TOLERANCES(PHYSIOLOGY), THRESHOLDS(PHYSIOLOGY), HUMANS, BEHAVIOR, ATTITUDES(PSYCHOLOGY) (U)

AIRCRAFT IN SUPERSONIC FLIGHT GENERATE PRESSURE WAVES THAT ARE PERCEIVED ALONG THE GROUND AS SONIC BOOMS. THE IMPACT OF THE SONIC BOOM PHENOMENON UPON HUMANS HAS GENERATED A GREAT DEAL OF CONCERN AND CONJECTURE REGARDING INDIVIDUAL RESPONSES AND PERCEPTIONS, GROUP RESPONSES, AND PHYSIOLOGICAL RESPONSES. DATA ACCUMULATED DURING THE PAST SEVERAL YEARS BY SPECIFIC GOVERNMENTAL AND AVIATION AGENCIES HAVE PROVIDED SOME INSIGHT INTO THE MANNER IN WHICH INDIVIDUALS AND COMMUNITIES HAVE RESPONDED TO THE SONIC BOOM. THE REPORT SUMMARIZES THESE DATA IN TERMS OF THE NATURE OF HUMAN RESPONSES AND THE MANNER IN WHICH THEY OCCUR, FACTORS INFLUENCING ACCEPTANCE OF THE BOOM, THE POSSIBILITY OF PHYSIOLOGICAL INJURY, PSYCHOLOGICAL EFFECTS, AND SOME REPORTS OF ALLEGED MINOR DAMAGE TO PROPERTY AND THEIR RELATION TO HUMAN REACTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 619 720
REGIONAL ENVIRONMENTAL HEALTH LAB (AFLC) KELLY AFB TEX

EFFECT OF SONIC BOOMS ON THE HATCHABILITY OF CHICKEN EGGS. (U)

FEB 65 40P HEINEMANN,JACK M. ;LEBROCQ, ERIC F. ,JR.;
PROJ: 62-2
MONITOR: FAA-SST 65-12

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LIMITED NUMBER OF COPIES CONTAINING COLOR OTHER THAN BLACK AND WHITE ARE AVAILABLE UNTIL STOCK IS EXHAUSTED. REPRODUCTIONS WILL BE MADE IN BLACK AND WHITE ONLY.

DESCRIPTORS: (*SONIC BOOM, DAMAGE), (*EGGS, SONIC BOOM), CHICKENS, EXPOSURE(PHYSIOLOGY), EMBRYOS, STRESS(PHYSIOLOGY), SUPERSONIC AIRCRAFT, VETERINARY MEDICINE (U)

STRAIN=CROSS WHITE LEGHORN HATCHING EGGS WERE INCUBATED IN AN AREA SUBJECTED TO 30 OR MORE SONIC BOOMS PER DAY THROUGHOUT THE 21 DAYS REQUIRED TO HATCH CHICKEN EGGS. THE OVERPRESSURES OF THESE SONIC BOOMS, CREATED BY USAF SUPERSONIC F-104 AIRCRAFT, WERE EQUAL TO OR MUCH GREATER THAN THOSE NORMALLY PRODUCED BY OPERATIONAL MILITARY AIRCRAFT OR THE PROPOSED CIVILIAN SUPERSONIC TRANSPORT (SST). THE HATCHABILITY OF THE EGGS EXPOSED TO THE SONIC BOOMS WAS NOT LOWER THAN THAT OF UNEXPOSED EGGS OR TO PREVIOUS HATCHES OF THIS STRAIN IN A COMMERCIAL HATCHERY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 620 347
TENNESSEE UNIV KNOXVILLE

AN ANALYSIS OF LIABILITY IN AIRCRAFT TRESPASS AND NUISANCE CASES SINCE 1958. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
AUG 65 85P ROBINS,RAYMOND C. ;
CONTRACT: AF33 608 1118

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED TO THE GRADUATE COUNCIL OF THE UNIVERSITY OF TENNESSEE.

DESCRIPTORS: (*JET PLANE NOISE, LAW), (*LAW, JET PLANE NOISE), SONIC BOOM, AIRPORTS, MILITARY FACILITIES, UNITED STATES GOVERNMENT, AIRCRAFT NOISE, LOW ALTITUDE, FLIGHT, MILITARY LAW (U)

THE STUDY DISCUSSES THE NATURE OF THE AIRCRAFT NOISE PROBLEM, ANALYZES COURT CASES INVOLVING JET NOISE AROUND AIRPORTS AND MILITARY BASES, AND IDENTIFIES THE FACTORS SIGNIFICANT IN DETERMINING WHETHER NOISE CONSTITUTES A COMPENSABLE DAMAGE. IN THE 1946 'UNITED STATES V. CAUSBY' CASE, THE U. S. WAS HELD LIABLE FOR THE NOISE OF ARMY PLANES THAT INTERFERED SERIOUSLY WITH THE OPERATION OF CAUSBY'S CHICKEN FARM. IN THE 1962 'GRIGGS V. ALLEGHENY COUNTY' CASE, THE SUPREME COURT HELD THE MUNICIPALITY OPERATING THE GREATER PITTSBURG AIRPORT LIABLE FOR AIRCRAFT NOISE, SAYING THE COUNTY SHOULD HAVE CONDEMNED ENOUGH PROPERTY TO PREVENT AIRCRAFT OPERATIONS FROM INTERFERING WITH ADJACENT LANDOWNERS. THE CONTENTION IS MADE THAT (1) HIGHER COURTS SHOULD INSIST ON MORE CONSISTENT INTERPRETATION OF THE CRITERIA USED TO DETERMINE WHEN AN EASEMENT HAS BEEN TAKEN, ALTITUDE ALONE BEING A LESS IMPORTANT FACTOR THAN OTHERS, (2) INTENSITY AND FREQUENCY OF NOISE AND THE USE MADE OF THE PROPERTY IS MORE IMPORTANT THAN A LINE MARKING THE PROPERTY BOUNDARY, (3) RIGID REQUIREMENTS SHOULD BE SET TO INSURE ADEQUATE SPACE FOR NEW AIRPORTS, (4) SOLVING THE NOISE PROBLEM AT EXISTING AIRPORTS SHOULD BE A COOPERATIVE EFFORT, AND (5) DETERMINATION OF COMPENSABLE NOISE DAMAGE SHOULD BE MADE BY COURTS WITH CONSIDERATION MORE FOR DEGREE OF DISTURBANCE THAN FOR PROPERTY BOUNDARIES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 624 050 1/2 20/1
SUPERSONIC TRANSPORT DEVELOPMENT FEDERAL AVIATION AGENCY
WASHINGTON D C

SONIC BOOM RESEARCH AND DESIGN CONSIDERATIONS IN THE DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT (SST), (U)

NOV 65 32P HIGGINS,THOMAS H. I
REPT. NO. FAA-SST-65-19

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE MEETING OF THE ACOUSTICAL SOCIETY OF AMERICA (70TH), ST. LOUIS, MO.

DESCRIPTORS: (*SONIC BOOM, COMMERCIAL PLANES), (*SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT), (*TRANSPORT, SUPERSONIC AIRCRAFT), (*COMMERCIAL PLANES, SONIC BOOM), AIRCRAFT NOISE, TOLERANCES(PHYSIOLOGY), REACTION(PSYCHOLOGY), PUBLIC OPINION, STRUCTURES, DAMAGE, SCIENTIFIC RESEARCH, OKLAHOMA, NEW MEXICO, ACOUSTICS, AERONAUTICS (U)

THIS PAPER PRESENTS A SHORT HISTORY OF SONIC BOOM RESEARCH AND RELATED OPERATIONAL CONSIDERATIONS IN THE DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT (SST). THE MOST INTENSIVE PUBLIC REACTION RESEARCH PROGRAM TO DATE WAS CONDUCTED AT OKLAHOMA CITY, OKLAHOMA. AN INTENSIVE RESEARCH PROGRAM TO DETERMINE STRUCTURAL REACTION TO SONIC BOOMS WAS CONDUCTED AT THE WHITE SANDS MISSILE RANGE. THESE TWO PROGRAMS ARE DISCUSSED AND A BRIEF SUMMARY OF THE FINDINGS OF THE PROGRAMS IS PRESENTED. THE PAPER CONCLUDES THAT ALTHOUGH MUCH HAS BEEN LEARNED ABOUT THE SONIC BOOM PHENOMENA THROUGH PAST FLIGHT AND RESEARCH ACTIVITIES, ADDITIONAL RESEARCH AND THEORETICAL STUDIES ARE WARRANTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 625 332 1/3 20/1 5/10 13/13
NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA. VOLUME II. DATA ON COMMUNITY REACTIONS AND INTERPRETATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT., APR 63-FEB 65,
OCT 65 315P BORSKY,PAUL N. ;
REPT. NO. 101-PT-2
CONTRACT: AF33(657)-11148
PROJ: 7231
TASK: 723103
MONITOR: AMRL , TR-65-37-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SONIC BOOM, PUBLIC OPINION), ATTITUDES(PSYCHOLOGY), POPULATION, URBAN AREAS, DAMAGE, STRUCTURES, REACTION(PSYCHOLOGY), NOISE, SUPERSONIC AIRCRAFT, COMMERCIAL PLANES, OKLAHOMA, TABLES(DATA) (U)

DURING A PERIOD OF SIX MONTHS FROM FEBRUARY TO JULY 1964, THE OKLAHOMA CITY, OKLAHOMA, AREA WAS REPEATEDLY EXPOSED TO SONIC BOOMS GENERATED TO SIMULATE OVERPRESSURE LEVELS THAT ARE EXPECTED FOR SUPERSONIC TRANSPORT OVERFLIGHTS. THE SCHEDULE PROVIDED FOR EIGHT SONIC BOOMS PER DAY. DURING THE SIX-MONTH PERIOD, ALMOST 3,000 LOCAL RESIDENTS WERE INTERVIEWED THREE TIMES TO DETERMINE THE NATURE AND EXTENT OF THEIR REACTIONS TO THE SONIC BOOMS. THIS REPORT CONTAINS A DETAILED DESCRIPTION OF THE OVERALL STUDY DESIGN INCLUDING THE SELECTION OF HOUSEHOLDS, SELECTION OF RESPONDENTS, TRAINING AND SELECTION OF INTERVIEWERS AND SAMPLES OF QUESTIONNAIRES USED DURING THE INTERVIEWS. AMONG THE FINDINGS IT WAS DETERMINED THAT ORDINARY LIVING ACTIVITIES WERE OFTEN INTERRUPTED BY SONIC BOOMS, BUT THAT A MAJORITY OF THE RESIDENTS FELT THEY COULD LEARN TO LIVE WITH THE INTERRUPTIONS. A SUBSTANTIAL NUMBER OF RESIDENTS FELT THEY HAD SUSTAINED DAMAGES FROM THE BOOMS, ALTHOUGH DETAILED ENGINEERING OBSERVATIONS OF STRUCTURES IN THE AREA DID NOT CONFIRM MOST OF THESE REPORTS. AS THE INTENSITY OF THE BOOMS INCREASED, ACCEPTANCE OF THE BOOMS BY RESIDENTS WAS REDUCED. RESIDENTS WHO FELT THAT THE DEVELOPMENT OF A COMMERCIAL SUPERSONIC AIRPLANE WAS IMPORTANT WERE MORE LIKELY TO ACCEPT THE EXPOSURES TO THE SONIC BOOMS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 628 175 6/10
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

ON NOISE AND VIBRATION EXPOSURE CRITERIA, (U)

APR 65 17P VON GIERKE,HENNING E. ;
REPT. NO. AMRL-TR-65-84,
PROJ: AF-7231,
TASK: 723101,

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN ARCHIVES OF ENVIRONMENTAL HEALTH V11 P327-39 SEP 1965. COPIES TO DDC USERS ONLY.
SUPPLEMENTARY NOTE:

DESCRIPTORS: (*NOISE, TOLERANCES(PHYSIOLOGY)), (*VIBRATION, TOLERANCES(PHYSIOLOGY)), SONIC BOOM, PERFORMANCE(HUMAN), INDUSTRIAL MEDICINE, STANDARDS, SUPERSONIC AIRCRAFT, STRESS(PHYSIOLOGY) (U)

REPRINT: ON NOISE AND VIBRATION EXPOSURE CRITERIA.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 637 563 1/3 20/1 5/10
NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA. VOLUME III. QUESTIONNARIES. APPENDIX TO VOLUME II. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 63-FEB 65.
MAR 66 60P BORSKY,PAUL N. ;
CONTRACT: AF 33(657)-11148,
PROJ: AF-7231,
TASK: 723103,
MONITOR: AMRL TR-65-37-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-625 332.

DESCRIPTORS: (*SONIC BOOM, PUBLIC OPINION), REACTION(PSYCHOLOGY), NOISE, SOUND, PRESSURE, SUPERSONIC AIRCRAFT, OKLAHOMA (U)

THE APPENDIX CONTAINS SAMPLES OF QUESTIONNAIRES USED DURING THE INTERVIEWS THAT TOOK PLACE FROM FEBRUARY TO JULY 1964 IN THE OKLAHOMA CITY, OKLAHOMA, AREA. THAT AREA WAS REPEATEDLY EXPOSED TO SONIC BOOMS GENERATED TO SIMULATE OVERPRESSURE LEVELS THAT ARE EXPECTED FOR SUPERSONIC TRANSPORT OVERFLIGHTS. THE SCHEDULE PROVIDED FOR EIGHT SONIC BOOMS PER DAY. DURING THE 6-MONTH PERIOD, ALMOST 3,000 LOCAL RESIDENTS WERE INTERVIEWED THREE TIMES TO DETERMINE THE NATURE AND EXTENT OF THEIR REACTIONS TO THE SONIC BOOMS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMG9

AD- 641 352 6/19 5/10 20/1
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

EFFECTS OF SONIC BOOM ON PEOPLE: REVIEW AND OUTLOOK. (U)

NOV 65 12P VON GIERKE,HENNING E. I

REPT. NO. AMRL-TR-65-195
PROJ: AF-7231
TASK: 723103

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF ACOUSTICAL SOCIETY OF AMERICA V39 N5 PT2 PS43-50 MAY 1966.

DESCRIPTORS: (*SONIC BOOM, TOLERANCES(PHYSIOLOGY)), (*PSYCHOACOUSTICS, SONIC BOOM), STRESS(PHYSIOLOGY), STRESS(PSYCHOLOGY), PRESSURE, NOISE, THRESHOLDS(PHYSIOLOGY), VIBRATION, SOCIAL PSYCHOLOGY, REVIEWS, SYMPOSIA (U)

THE REPORT REVIEWS THE HISTORY OF OBSERVATIONS ON HUMAN REACTIONS TO THE SONIC BOOM FROM THE TIME WHEN THE BOOM WAS A DEMONSTRATION CURIOSITY TO THE PRESENT DAY WHERE REACTION OF THE POPULATION TO THE SONIC BOOM IS A SCIENTIFIC PROBLEM OF TECHNICAL, ECONOMIC, SOCIAL, AND POLITICAL CONSEQUENCES AT THE NATIONAL AND INTERNATIONAL LEVEL. THE FIELD PROGRAMS CONDUCTED BY THE USAF AND NASA OVER THE LAST 15 YEARS AND OVER THE LAST 5 YEARS BY THE FAA WERE ALL OF LIMITED SCOPE WITH RESPECT TO EXPLORING DIRECT AND INDICRECT PHYSIOLOGICAL AND PSYCHOLOGICAL HUMAN REACTIONS TO SONIC BOOMS OF DIFFERENT INTENSITY AND EXPOSURE FREQUENCY. ALTHOUGH THE DATA ACCUMULATED MIGHT BE ADEQUATE TO DECIDE ON PRELIMINARY STOPGAP EXPOSURE CRITERIA, IT IS OBVIOUS THAT A BROADER APPROACH TO THE PROBLEM IS REQUIRED. LABORATORY WORK IN SUPPORT OF THESE QUESTIONS HAS HARDLY BEEN STARTED. NEITHER CONVENTIONAL ACOUSTIC AND VIBRATION GENERATORS FOR BOOM-TYPE STIMULATION NOR SPECIAL EQUIPMENT FOR HIGH-FIDELITY SONIC-BOOM SIMULATION HAVE BEEN FULLY UTILIZED. SOME OF THE OPEN QUESTIONS AND POSSIBLE APPROACHES ARE DISCUSSED AS PART OF A BROAD, LONG-RANGE RESEARCH PROGRAM REQUIRED TO COME UP WITH SCIENTIFIC DATA AS BASES FOR OPERATIONAL SONIC-BOOM EXPOSURE CRITERIA.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 646 028 1/3 20/1
BOEING CO RENTON WASH AIRPLANE DIV

EFFECT OF SONIC BOOM ON SUPERSONIC TRANSPORT DESIGN AND PERFORMANCE, (U)

FEB 64 17P KANE,EDWARD J. ;SIGALLA, ARMAND ;
REPT. NO. D6-8614

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONFERENCE ON APPLIED METEOROLOGY OF THE AMERICAN METEOROLOGICAL SOCIETY; ATMOSPHERIC PROBLEMS OF AEROSPACE VEHICLES (5TH), MARCH 2-6, 1964, ATLANTIC CITY, NEW JERSEY.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, DESIGN), (*TRANSPORT AIRCRAFT, DESIGN), (*SONIC BOOM, CONTROL), CONFIGURATION, PERFORMANCE(ENGINEERING), PRESSURE, LIFT, ATMOSPHERES, FLIGHT PATHS (U)

THE PAPER DISCUSSES THE EFFECT OF SONIC BOOM OVERPRESSURE LIMITS ON THE DESIGN AND PERFORMANCE OF A SUPERSONIC TRANSPORT. POSSIBLE METHODS OF REDUCING THE SONIC BOOM BY CONFIGURATION TAILORING AND THE EFFECT OF THIS ON PERFORMANCE ARE DESCRIBED. THE SONIC BOOM OVERPRESSURE PRODUCED BY AN AIRPLANE IS INFLUENCED BY CONTRIBUTIONS OF THE VOLUME AND LIFT OF THE CONFIGURATION, THE STRUCTURE OF THE ATMOSPHERE, AND THE FLIGHT PATH OF THE AIRPLANE. ESTABLISHMENT OF MAXIMUM OVERPRESSURE LEVELS MAY IMPOSE SERIOUS DESIGN AND OPERATION RESTRICTIONS ON THE AIRPLANE, RESULTING IN A COMPROMISED CONFIGURATION WHICH DOES NOT OPERATE EFFICIENTLY. IT IS POSSIBLE TO CONTROL THE SHOCK WAVE STRENGTH BY CAREFUL DESIGN OF THE CONFIGURATION SO AS TO EMPLOY FAVORABLE INTERACTIONS BETWEEN THE LIFT AND VOLUME CONTRIBUTIONS. HOWEVER, CARE MUST BE TAKEN NOT TO COMPROMISE OTHER DESIGN FEATURES OF THE AIRPLANE, SUCH AS ITS DRAG, IN ORDER TO OBTAIN LOWER SONIC BOOM OVERPRESSURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 646 676 1/3 20/1 1/2
DEPUTY CHIEF OF STAFF RESEARCH AND DEVELOPMENT (AIR FORCE)
WASHINGTON D C

THE SONIC BOOM PROBLEM. (U)

DESCRIPTIVE NOTE: DEVELOPMENT PLANNING MEMO.
MAR 63 32P

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, STATE-OF-THE-ART REVIEWS), (*SUPERSONIC AIRCRAFT, DESIGN), (*TRANSPORT AIRCRAFT, DESIGN), (*CIVIL AVIATION, SONIC BOOM), FLIGHT TESTING, LIFT, PUBLIC OPINION, PROPAGATION, SUPERSONIC FLIGHT (U)

THE MEMO SUMMARIZES THE CURRENT STATE OF KNOWLEDGE RELATING TO SONIC BOOM GENERATION, PROPAGATION, AND EFFECTS, AND ATTEMPTS TO JUDGE THE SEVERITY OF THE PROBLEM THAT WILL ARISE WITH THE BEGINNING OF COMMERCIAL SUPERSONIC FLIGHTS. IT IS BASED ON BOTH RECENTLY PUBLISHED INFORMATION AND CONVERSATIONS WITH SPECIALISTS THROUGHOUT THE COUNTRY WHO ARE WORKING IN THE SONIC BOOM FIELD. THE LATTER INCLUDE REPRESENTATIVES OF PRIVATE INDUSTRY AS WELL AS OF GOVERNMENT AGENCIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 647 326 20/1
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

EFFECTS OF SONIC BOOM ON PEOPLE: ST. LOUIS, MISSOURI, 1961-1962. (U)

NOV 65 12P NIXON,CHARLES W. ;BORSKY, PAUL N. ;

REPT. NO. AMRL-TR-65-196
PROJ: AF-7231
TASK: 723102

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA V39 N5 PT2 PS51-8 MAY 1966. PREPARED IN COOPERATION WITH CHICAGO UNIV., ILL. NATIONAL OPINION RESEARCH CENTER.
SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY NASA CONTRACT NAS1-1397.

DESCRIPTORS: (*SONIC BOOM, MEDICAL RESEARCH), (*PUBLIC OPINION, SONIC BOOM), HUMANS, NOISE, SUPERSONIC FLIGHT, SUPERSONIC AIRCRAFT, ACOUSTICS, DAMAGE, SOUND TRANSMISSION (U)

THE VICINITY OF ST. LOUIS, MISSOURI, WAS EXPOSED TO APPROXIMATELY 150 SONIC BOOMS DURING A 10-MONTH PERIOD FROM JULY 1961 TO APRIL 1962. GROUND OVERPRESSURES, RANGING UP TO ABOUT 3 LB/SQ FT, WERE CAREFULLY MEASURED FOR A SERIES OF 17 OF THE SUPERSONIC FLIGHTS. DATA OBTAINED FROM OVER 2300 DIRECT INTERVIEWS, ANALYSES OF COMPLAINTS, AND ENGINEERING EVALUATIONS OF ALLEGED DAMAGE WERE RELATED TO INFORMATION ON AIRCRAFT OPERATIONS AND SONIC-BOOM OVERPRESSURE MEASUREMENTS. MOST RESIDENTS INTERVIEWED INDICATED SOME INTERFERENCE WITH ROUTINE LIVING ACTIVITIES, YET LESS THAN 1% FILED FORMAL COMPLAINTS. ALLEGED BUILDING DAMAGE WAS SUPERFICIAL IN NATURE AND CONSISTED MOSTLY OF CRACKS IN BRITTLE SURFACES. THERE WERE NO REPORTS OF DIRECT ADVERSE PHYSIOLOGICAL EFFECTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 647 513 20/1 14/2 1/2 19/1
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)

SONIC BANG SIMULATION BY A NEW EXPLOSIVES TECHNIQUE. (U)

DEC 66 7P HAWKINS,S. J. ;HICKS,J. A. ;

REPT. NO. ERDE-OFFPRINT-66/13

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN NATURE V211 N5055 P1244-5 SEP 17 1966.

DESCRIPTORS: (*SONIC BOOM, SIMULATION), (*EXPLOSIVE CHARGES, GEOMETRIC FORMS), SUPERSONIC FLIGHT, SHOCK WAVES, ACOUSTICS, MECHANICAL WAVES, GREAT BRITAIN (U)

A STUDY OF THE FEASIBILITY OF USING EXPLOSIVES TO SIMULATE THE PRESSURE WAVEFORMS GENERATED AT GROUND LEVEL BY SUPERSONIC OVERFLIGHTS LED TO THE REALIZATION THAT IT IS POSSIBLE TO SIMULATE WAVEFORMS OF A WIDE RANGE OF SHAPES AND DURATIONS USING EXTENDED EXPLOSIVE CHARGES HAVING A HIGH LENGTH/ BREADTH RATIO. THE REPORT DESCRIBES PRELIMINARY RESULTS OBTAINED FROM USING THESE CHARGES IN SONIC BOOM SIMULATION STUDIES, AND INDICATES A NUMBER OF OTHER APPLICATIONS IN WHICH SUCH TECHNIQUES SHOW PROMISE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 648 264 20/14 20/1 17/9
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

PRELIMINARY EXPERIMENTAL STUDY OF EMAC PROBE USING ACOUSTIC SHOCK WAVES AS REFLECTING SURFACES. (U)

DESCRIPTIVE NOTE: FINAL REPT., NOV 63-JAN 65,
NOV 65 66P ALLEN,CLAYTON H. ;WEINER,
STEPEN D. ;
REPT. NO. BBN-1228
CONTRACT: AF 19(628)-4013
PROJ: AF-6672
TASK: 667205

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTROMAGNETIC RADIATION, *ACOUSTICS), DOPPLER RADAR, METEOROLOGICAL RADAR, COHERENT RADAR, SONIC BOOM, RADAR CLUTTER, SIGNALS, SHOCK WAVES, FEASIBILITY STUDIES, RADAR REFLECTIONS (U)

PRELIMINARY EXPERIMENTS HAVE BEEN MADE IN AN ATTEMPT TO DEMONSTRATE THE FEASIBILITY OF REFLECTING RADAR FROM AN ACOUSTIC SHOCK WAVE. TESTS WERE CONDUCTED USING UHF RADAR (71.5 CM WAVELENGTH) TO VIEW SONIC BOOM SHOCK WAVES. HOWEVER, GROUND CLUTTER RAISED THE EFFECTIVE NOISE LEVEL AND ATMOSPHERIC TURBULENCE MAY HAVE ROUGHENED THE SHOCK FRONT ENOUGH TO DECREASE THE RETURNED SIGNAL LEVEL SIGNIFICANTLY; AS A RESULT, NO INDICATION OF A RETURN IDENTIFIABLE WITH THE SONIC BOOM SHOCK FRONT WAS OBSERVED. IT IS CONCLUDED THAT THE USE OF DOPPLER TECHNIQUES TO ELIMINATE CLUTTER AND THE USE OF COHERENT INTEGRATION TO INCREASE THE EFFECTIVE SIGNAL LEVEL ARE NECESSARY FOR THE SUCCESS OF THIS EMAC PROBE TECHNIQUE. BRIEF THEORETICAL AND EXPERIMENTAL STUDIES OF SHOCK WAVE SOURCES WERE CONDUCTED. PROPOSALS ARE PRESENTED FOR FURTHER DEFINITIVE EXPERIMENTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 651 857 14/2 20/1
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

PROPOSAL FOR A SHOCK-TUBE FACILITY TO SIMULATE SONIC BANGS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 66 19P WARREN,C. H. E. ;
REPT. NO. TR-66344

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHOCK TUBES, SONIC BOOM), (*SONIC BOOM, SIMULATION), SUPERSONIC FLIGHT, DESIGN, AIRCRAFT, SOUND TRANSMISSION, GREAT BRITAIN (U)

THE REPORT PROPOSES THE USE OF A SHOCK-TUBE FACILITY TO SIMULATE SONIC BANGS FOR THE STUDY OF THEIR EFFECTS. THE BASIC PHILOSOPHY OF SUCH A FACILITY IS PROPOUNDED FROM THEORETICAL CONSIDERATIONS, SUBSTANTIATED BY SOME PILOT EXPERIMENTAL STUDIES. IT IS SUGGESTED THAT A DETAILED DESIGN OF A FACILITY BASED ON THE PROPOSALS SHOULD NOW BE MADE. THIS WILL REQUIRE THE SOLUTION OF A NUMBER OF TECHNICAL PROBLEMS, WHICH ARE LISTED. (U)
(AUTHOR)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 651 899 20/1 4/2 4/1
BUREAU OF NAVAL WEAPONS WASHINGTON D C WEAPON SYSTEMS ANALYSIS DIV

WEATHER ASPECTS OF THE SONIC BOOM, (U)

MAY 60 61P FISHER,DAVID ;
REPT. NO. RRSY-60-24

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, METEOROLOGICAL PHENOMENA), (*SOUND TRANSMISSION, METEOROLOGICAL PHENOMENA), MACH NUMBER, JET STREAMS, SHOCK WAVES, AIRCRAFT NOISE, WIND, ATMOSPHERIC TEMPERATURE, ATMOSPHERE MODELS (U)

AN EXPLANATION OF THE EFFECT OF METEOROLOGICAL CONDITIONS ON THE PATH OF THE SONIC BOOM IS PRESENTED. AREAS COVERED BY SONIC BOOMS RESULTING FROM AIRCRAFT FLYING AT VARIOUS MACH NUMBERS AND DIVE ANGLES ARE SHOWN, TAKING STANDARD ATMOSPHERIC GRADIENTS INTO ACCOUNT. CALCULATIONS ARE GIVEN FOR THE EFFECT OF THE JET STREAM AS WELL AS ORDINARY WINDS ON THE SONIC BOOM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 651 907 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

AVIATION MEDICINE TRANSLATIONS: ANNOTATED BIBLIOGRAPHY OF RECENTLY TRANSLATED MATERIAL. IV, (U)

JAN 66 15P ALLEN,MARY ELLEN ;CRAIN, RUTH ANN ;
MONITOR: FAA-AM 66-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*AVIATION MEDICINE, BIBLIOGRAPHIES), ABSTRACTS, VERTIGO, NYSTAGMUS, HYPOXIA, VISION, HIGH ALTITUDE, DRUGS, HEARING, DECOMPRESSION, VESTIBULAR APPARATUS, BLACKOUT(PHYSIOLOGY), HUMAN FACTORS ENGINEERING, PROPRIOCEPTION, SONIC BOOM, ACCELERATION TOLERANCE, SPACE PERCEPTION, STRESS(PHYSIOLOGY) (U)

AN ANNOTATED BIBLIOGRAPHY OF TRANSLATIONS OF FOREIGN-LANGUAGE ARTICLES IS PRESENTED. THE 25 LISTED ENTRIES ARE CONCERNED WITH STUDIES IN AVIATION MEDICINE, VERTIGO AND NYSTAGMUS, PHYSICAL SCIENCE, HYPOXIA, VISION, ALTITUDE, DRUGS, BINAURAL HEARING, TIME SHIFTS, GRAVITY EFFECTS, PERCEPTION, DECOMPRESSION, AND SONIC BOOM. PROCEDURES FOR OBTAINING COPIES OF THE TRANSLATIONS ARE INCLUDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 655 310 1/2 5/10 5/5 13/13
20/1

STANFORD RESEARCH INST MENLO PARK CALIF

SONIC BOOM EXPERIMENTS AT EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: INTERIM REPT.
JUL 67 41OP
CONTRACT: AF 49(638)-1758
PROJ: SRI-ETU-6065
MONITOR: NSBEO 1-67

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, RESPONSE), (*REACTION(PSYCHOLOGY), SONIC BOOM), (*STRUCTURES, SONIC BOOM), ANIMALS, HUMANS, SUPERSONIC AIRCRAFT, AIRCRAFT NOISE, PROPAGATION, DAMAGE, ACCEPTABILITY, TESTS, SEISMOLOGY (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

A SERIES OF TESTS WAS CONDUCTED IN WHICH HUMAN SUBJECTS (LOCATED INDOORS AND OUTDOORS), SPECIAL TEST STRUCTURES, AND ANIMALS WERE EXPOSED TO BOOMS FROM F-104, F-106, B-58, SR-71, AND XB-70 SUPERSONIC AIRCRAFT, AND THE NOISE FROM KC-135 AND WC-135B SUBSONIC AIRCRAFT. PHYSICAL MEASUREMENTS WERE MADE OF THE SONIC BOOM SIGNATURES, SUBSONIC AIRCRAFT NOISE, AND THE RESPONSE OF STRUCTURES TO THE BOOMS AND NOISE. PSYCHOLOGICAL MEASUREMENTS WERE MADE OF THE SUBJECTIVE ACCEPTABILITY TO SEVERAL HUNDRED SUBJECTS OF THE BOOMS AND SUBSONIC AIRCRAFT NOISE. DETAILS OF THE TEST PLAN AND PROCEDURES, AND THE RESULTS OF THE DATA ANALYZED TO DATE ARE PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 655 603 1/3 14/1 5/3
DEPARTMENT OF COMMERCE WASHINGTON D C

SST AN ECONOMIC ANALYSIS. PART I. EXECUTIVE SUMMARY, (U)

MAR 65 170P CONNOR,JOHN T. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 604 AND AD-655 605.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, ECONOMICS), (*TRANSPORT AIRCRAFT, ECONOMICS), FEASIBILITY STUDIES, DECISION MAKING, DESIGN, COSTS, AIR TRANSPORTATION, SONIC BOOM, SPECIFICATIONS, AIRCRAFT INDUSTRY, COST EFFECTIVENESS, ANALYSIS (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

CONTENTS: AUTHORITY FOR STUDY; STATEMENT OF THE PROBLEM; POLICY ISSUES: PACE, COMPETITION, AND RISK-SHARING; AIRCRAFT CONSIDERED; SUMMARY OF RESULTS AND POLICY CONSIDERATIONS; STUDY APPROACH; AIRCRAFT DESCRIPTIONS; ESTIMATING MARKETS FOR AIR TRANSPORT AND AIRCRAFT; RANKING OF PROGRAM ALTERNATIVES; ECONOMIC SIGNIFICANCE OF SONIC BOOM; SST PROGRAM FINANCING; BALANCE OF PAYMENTS EFFECTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 655 604 1/3 14/1 5/3
DEPARTMENT OF COMMERCE WASHINGTON D C

SST AN ECONOMIC ANALYSIS. PART I. EXECUTIVE SUMMARY, PRELIMINARY SUPPLEMENT I, (U)

APR 65 90P CONNOR,JOHN T. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 603.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, ECONOMICS), (*TRANSPORT AIRCRAFT, ECONOMICS), FEASIBILITY STUDIES, SONIC BOOM, COST EFFECTIVENESS, MANAGEMENT PLANNING AND CONTROL, ANALYSIS, COSTS, AIRCRAFT INDUSTRY (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

CONTENTS: PURPOSE AND SCOPE; PROGRAM ALTERNATIVES; PROSPECTUS (CONTINUATION OF THE SST PROGRAM, TERMINATION OF THE SST PROGRAM); COST-BENEFIT ANALYSIS(PROGRAM RANKING, POLICY ISSUES, SENSITIVITY ANALYSIS, COMPARATIVE CASH FLOWS). (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMD9

AD- 655 608 1/3 14/1 5/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND POLITICAL STUDIES DIV

SST AN ECONOMIC ANALYSIS. PART III. CONTRACTOR'S REPORTS. C. SONIC BOOM. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,
DEC 64 150P ASHER,NORMAN J. ;DZIUBAN, STANLEY W. ;HAMBURGER,WILLIAM ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 607.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, ECONOMICS), (*TRANSPORT AIRCRAFT, ECONOMICS), SONIC BOOM, DAMAGE, COSTS, ANALYSIS, BUILDINGS, MATHEMATICAL MODELS, COST EFFECTIVENESS (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE PURPOSE OF THE STUDY IS TO ESTIMATE CLAIMS COSTS RESULTING FROM THE SONIC BOOM OF THE SST, AND TO EXAMINE TRADEOFFS BETWEEN THESE COSTS AND AIRCRAFT OPERATING COSTS FOR VARIOUS OPERATING PROCEDURES DESIGNED TO REDUCE CLAIMS COSTS. CLAIMS FOR DAMAGE TO GROUND STRUCTURES COMPRISE BY FAR THE LARGEST CATEGORY OF CLAIMS. BASED ON THE OKLAHOMA CITY DATA, THE MAJOR ITEM OF COST WAS ADMINISTRATIVE HANDLING OF THE CLAIMS. ACTUAL PAYMENTS FOR ALLEGED DAMAGES WERE SMALL. THE OKLAHOMA CITY CLAIMS DATA ARE REPRESENTATIVE OF THE SITUATION THAT MAY EXIST IN THE US AND CANADA DURING THE SST OPERATIONS. HOWEVER, THEY ARE ALMOST CERTAINLY NOT REPRESENTATIVE OF THE SITUATION THAT WILL BE FOUND IN OTHER AREAS OF THE WORLD. SST OPERATIONS SHOULD NOT DAMAGE THE BASIC STRUCTURE OF REASONABLY WELL-CONSTRUCTED BUILDINGS. IT IS NOT CLEAR THAT AN AIRLINE (OR THE FEDERAL GOVERNMENT, FOR THAT MATTER) WOULD BE LIABLE FOR SONIC BOOM DAMAGE RESULTING FROM THE OPERATION OF A COMMERCIAL TRANSPORT, FLOWN IN ACCORDANCE WITH FLIGHT RULES AND PROCEDURES PRESCRIBED BY THE FEDERAL GOVERNMENT. (U)

DDC REPORT BIBLIOGRAPHY. SEARCH CONTROL NO. /ZOM09

AD- 661 840 20/1 1/3
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C

THE SUPERSONIC TRANSPORT; THE SONIC BOOM AND YOU, (U)

67 40P POWERS,JOHN O. ;POWER, KENNETH ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, SONIC BOOM), (*TRANSPORT AIRCRAFT, SONIC BOOM), (*SONIC BOOM, REVIEWS), ECONOMICS, FLIGHT TESTING, DESIGN, STRUCTURES, STRESS(PHYSIOLOGY), STRESS(PSYCHOLOGY) (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

AN ATTEMPT WAS MADE TO OUTLINE THE HISTORICAL DEVELOPMENT OF THE UNITED STATES SUPERSONIC TRANSPORT DEVELOPMENT PROGRAM AND TO PLACE IN PROPER PERSPECTIVE THE NATIONAL SIGNIFICANCE OF THE SST PROGRAM. THE TECHNOLOGICAL ASPECTS AND PROBLEMS OF THE SONIC BOOM WERE REVIEWED. THE ACTUAL OVERFLIGHT SONIC BOOM PROGRAMS TO DATE WERE REVIEWED AND CAPSULE RESULTS WERE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 662 003 13/13 20/1 1/2
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH DIV

RESPONSE OF STRUCTURES TO SONIC BOOMS PRODUCED BY XB-70, B-58 AND F-104 AIRCRAFT, BASED ON SONIC BOOM EXPERIMENTS AT EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 67 378P BLUME,JOHN A. ;SHARPE, ROLAND L. ;KOST,GARRISON ;PROULX,JACQUES ;
CONTRACT: AF 49(638)-1739
MONITOR: NSBEO 2-67

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, LOADS(FORCES)), (*STRUCTURES, DAMAGE), (*SUPERSONIC AIRCRAFT, SONIC BOOM), TESTS, BOMBER AIRCRAFT, FIGHTER AIRCRAFT, BUILDINGS, RESPONSE, DEFORMATION (U)
IDENTIFIERS: B-58 AIRCRAFT, B-70 AIRCRAFT, F-104 AIRCRAFT (U)

THE RESPONSE OF TEST STRUCTURES AND STRUCTURE ELEMENTS TO SONIC BOOMS PRODUCED BY XB-70, B-58 AND F-104 AIRCRAFT WAS STUDIED. THESE AIRCRAFT PRODUCED SONIC BOOMS OF DIFFERENT SIGNATURE DURATIONS. THEY WERE FLOWN AT SEVERAL FLIGHT TRACK OFFSETS, ALTITUDES AND MACH NUMBERS SO AS TO GENERATE DIFFERENT OVERPRESSURE LEVELS AND SIGNATURE CHARACTERISTICS. FREE FIELD SIGNATURE DATA AND THE EFFECTS OF FREE FIELD SIGNATURE PARAMETERS ON STRUCTURAL RESPONSE WERE ANALYSED. STUDIES WERE MADE OF THE PLATE RESPONSE (LATERAL DEFORMATION) AND RACKING RESPONSE (IN-PLANE DEFORMATION) OF THE TEST STRUCTURES. DAMAGE COMPLAINTS RESULTING FROM THE TEST MISSIONS WERE INVESTIGATED AND THE RESULTS ANALYSED. THE IMPLICATIONS OF THE MAGNITUDES OF THE RESPONSES OF THE TEST STRUCTURES AND THE INVESTIGATION OF THE DAMAGE CLAIMS RESULTING FROM THE TEST MISSIONS ON POSSIBLE DAMAGE CAUSED BY SUPERSONIC FLIGHTS WERE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 662 893 13/13 20/1
DATACRAFT INC GARDENA CALIF

THEORETICAL STUDY OF STRUCTURAL RESPONSE TO NEAR-FIELD AND FAR-FIELD SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL-30 SEP 66, OCT 66 201P WIGGINS,JOHN H. ; JR.; KENNEDY,BRUCE ;
REPT. NO. 3407-8
CONTRACT: AF 49(638)-1777
PROJ: AF-7908

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *STRUCTURES), INTENSITY, MECHANICAL WAVES, FIGHTER AIRCRAFT, BOMBER AIRCRAFT, RESPONSE, THEORY, LOADS(FORCES), MODELS(SIMULATIONS) (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE STUDY INVESTIGATES THE DIFFERENCE BETWEEN NEAR-FIELD AND FAR-FIELD SONIC BOOM INTENSITIES. TO DO SO IT DEFINES A NEW INTENSITY STANDARD, EFFECTIVE STATIC LOAD WHICH DEPENDS ON LOAD WAVEFORM AS WELL AS MAGNITUDE. MANY SONIC BOOM LOADING WAVEFORMS ARE COMPUTED FOR 19 STRUCTURAL ELEMENTS, OF VARIOUS TYPES, PRODUCED BY TWO SST DESIGNS AS WELL AS F-104, B-58 AND XB-70 AIRCRAFT. IT IS CONCLUDED THAT NEAR-FIELD BOOMS ARE LESS INTENSE THAN FAR-FIELD BOOMS, THE MAGNITUDE OF THE DIFFERENCE DEPENDING ON THE CHARACTER OF THE WAVEFORM. THE MORE THE WAVEFORM IS DISTORTED FROM A SYMMETRICAL FAR-FIELD (N-WAVE) WAVESHAPE, THE LOWER THE NEAR-FIELD INTENSITY. IT IS RECOMMENDED THAT FURTHER THEORETICAL STUDY BE MADE IN ORDER TO QUANTIFY RESULTS AND ISOLATE THE INFLUENCE OF SPECIFIC PARAMETERS ON BOOM INTENSITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 668 942 1/3 20/1 13/13 6/16
5/10

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL
WASHINGTON D C

COMMITTEE ON SST-SONIC BOOM. (U)

DESCRIPTIVE NOTE: STATUS REPT.
JAN 65 34P

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, *TRANSPORT AIRCRAFT), (*SONIC BOOM, COMMERCIAL PLANES), JET BOMBERS, STRATEGIC WEAPONS, SHOCK WAVES, STRUCTURES, CONSTRUCTION MATERIALS, PHYSIOLOGY, REACTION(PSYCHOLOGY), PSYCHOPHYSIOLOGY, RESPONSE(BIOLOGY), ACCEPTABILITY (U)
IDENTIFIERS: B-70 AIRCRAFT, B-58 AIRCRAFT, *SUPERSONIC TRANSPORTS (U)

FOUR MAJOR PROBLEM AREAS ARE DISCUSSED: (1) GENERATION AND PROPAGATION OF SHOCK WAVES - THE AERONAUTICAL ASPECTS OF THE PROBLEM; (2) EFFECTS OF THE SONIC BOOM ON STRUCTURES AND STRUCTURAL MATERIAL; (3) PHYSIOLOGICAL EFFECTS OF THE SONIC BOOM; (4) BEHAVIORAL RESPONSE TO THE SONIC BOOM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 668 943 1/3 20/1 5/10 6/16
13/13

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL
WASHINGTON D C

COMMITTEE ON SST-SONIC BOOM. (U)

DESCRIPTIVE NOTE: STATUS REPT.
JUL 65 36P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH COLUMBIA UNIV., SCHOOL OF ENGINEERING AND APPLIED SCIENCES, NEW YORK CITY, N. Y.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, *TRANSPORT AIRCRAFT), (*SONIC BOOM, *COMMERCIAL PLANES), DESIGN, BUILDINGS, DAMAGE, PHYSIOLOGY, REACTION(PSYCHOLOGY), SLEEP, PUBLIC OPINION, ACCEPTABILITY, PREDICTIONS, ATTITUDES(PSYCHOLOGY), PSYCHOACOUSTICS, COSTS, LAW, PROPAGATION, JET AIRCRAFT, SHOCK WAVES (U)
IDENTIFIERS: OVERPRESSURE, SUPERSONIC TRANSPORTS (U)

CONTENTS: GENERATION AND PROPAGATION OF SONIC BOOMS - THE AERONAUTICAL ASPECTS OF THE SONIC BOOM PROBLEM--STATE OF KNOWLEDGE, INFLUENCE UPON AIRPLANE DESIGN, RESEARCH NEEDS; STRUCTURAL RESPONSE--STATE OF KNOWLEDGE; PHYSIOLOGICAL EFFECTS--INDIRECT OR 'TRIGGER' EFFECTS, DISTURBANCE OF SLEEP; PSYCHOLOGICAL RESPONSE--PUBLIC ACCEPTABILITY OF THE SONIC BOOM (PRESENT STATUS OF KNOWLEDGE, FUTURE TESTING), PSYCHOACOUSTIC EFFECTS(PSYCHOLOGICAL ACCEPTABILITY), FUTURE RESEARCH, LEGAL AND INSURANCE ASPECTS, PUBLIC RESPONSE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 680 454 6/16 20/1
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL
WASHINGTON D C COMM ON HEARING BIOACOUSTICS BIOMECHANICS

SUMMARY OF WORKING GROUP ACTIVITY FROM 1952 TO 1968 OF THE COMMITTEE ON HEARING, BIOACOUSTICS, AND BIOMECHANICS. (U)

DESCRIPTIVE NOTE: HISTORICAL SUMMARY 1952-1968.
DEC 68 50P
CONTRACT: NONR-2300(05)

UNCLASSIFIED REPORT

DESCRIPTORS: (*HEARING, SCIENTIFIC ORGANIZATIONS), BIOPHYSICS, PSYCHOACOUSTICS, AUDITORY PERCEPTION, NOISE, REACTION(PSYCHOLOGY), AUDIOMETRY, SONAR, SONIC BOOM, AIRPORTS, JET ENGINE NOISE, GUIDED MISSILES, ROCKET ENGINES, SPEECH (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 680 800 20/1 6/19 5/10 13/13
1/2

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

SONIC BOOMS RESULTING FROM EXTREMELY LOW-ALTITUDE SUPERSONIC FLIGHT: MEASUREMENTS AND OBSERVATIONS ON HOUSES, LIVESTOCK AND PEOPLE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 68 31P NIXON,C. W. ;HILLE,H. K.
;SOMMER,H. C. ;GUILD,ELIZABETH ;
REPT. NO. AMRL-TR-68-52
PROJ: AF-7231
TASK: 723103

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERSONIC FLIGHT, LOW ALTITUDE), (*SONIC BOOM, RESPONSE), (*STRESS(PHYSIOLOGY), SONIC BOOM), STRESS(PSYCHOLOGY), REACTION(PSYCHOLOGY), JET FIGHTERS, PRESSURE, STRUCTURES, ANIMALS, HUMANS, HOUSING(DWELLINGS), PSYCHOACOUSTICS, GLASS, RUPTURE, RESPONSE(BIOLOGY), SITE SELECTION, MILITARY TRAINING (U)
IDENTIFIERS: F-4C AIRCRAFT, F-4 AIRCRAFT, OVERPRESSURE (U)

SONIC BOOMS GENERATED BY F-4C AIRCRAFT FLYING LOW-LEVEL TERRAIN-FOLLOWING PROFILES DURING JOINT TASK FORCE II OPERATIONS NEAR TONOPAH, NEVADA, WERE RECORDED UNDER AND NEAR THE FLIGHT TRACKS, AND RESPONSES OF STRUCTURES, ANIMALS, AND PEOPLE WERE OBSERVED. RECORDED OVERPRESSURES UP TO 144 PSF WERE ANALYZED, CORRELATED WITH AVAILABLE AIRCRAFT OPERATIONS DATA, AND COMPARED WITH DATA FROM DIFFERENT AIRCRAFT FLYING SIMILAR PROFILES. OBSERVATIONS OF STRUCTURES, ANIMALS, AND PEOPLE WERE CORRELATED WITH THE MEASURED OVERPRESSURES. RESULTS INCLUDE ACQUISITION OF NEAR-FIELD RECORDINGS OF OVERPRESSURES GENERATED BY THE F-4C, THE FINDING THAT SOME WINDOW GLASS FRAGMENTS WERE PROPELLED A SHORT DISTANCE RATHER THAN FALLING DIRECTLY BELOW THE WINDOW, AN INSTANCE IN WHICH THE MEASURED OVERPRESSURE OF A SONIC BOOM 1 MILE TO THE SIDE OF THE TRACK FAR EXCEEDED THE PREDICTED VALUE, THE FINDING THAT LIVESTOCK (UNDETERMINED PRIOR EXPOSURE TO ACOUSTIC STIMULI IN THIS SITUATION) DID NOT RESPOND ADVERSELY TO THE SONIC BOOMS, (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 050 20/1 1/3 1/2 20/4
1/1

BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH FLIGHT SCIENCES LAB

AN ANALYSIS OF THE POSSIBILITY OF REDUCTION OF SONIC BOOM BY ELECTRO-AERODYNAMIC DEVICES, (U)

SEP 68 45P CHENG,SIN-I ;GOLDBURG, ARNOLD ;

REPT. NO. DI-82-0764
MONITOR: IDEP 347.60.00.00-C6-10

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH PRINCETON UNIV., N. J., DEPT. OF AEROSPACE AND MECHANICAL SCIENCES.

DESCRIPTORS: (*SONIC BOOM, REDUCTION), ELECTRIC DISCHARGES, IONS, ELECTRONS, INTERACTIONS, POWER SUPPLIES, DEFLECTION, SUPERSONIC FLOW, THRUST, SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT, COMMERCIAL PLANES, WEIGHT, FEASIBILITY STUDIES, AERODYNAMIC NOISE (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE PURPOSE OF THE PAPER IS TO INVESTIGATE THE PHYSICS OF ELECTRO-AERODYNAMIC TECHNIQUES FOR REDUCING THE SONIC BOOM AND TO DRAW CONCLUSIONS AS TO THE USEFULNESS OF THE PROPOSED TECHNIQUES. AN ANALYSIS OF THE INTERACTION OF IONS AND ELECTRONS OF AN ELECTRIC DISCHARGE WITH NEUTRAL PARTICLES IN MOVING AIR ACCORDING TO A ONE-DIMENSIONAL MODEL IS DESCRIBED AND ANALYZED. A SIMPLE EXPRESSION FOR THE CHANGE OF TOTAL STREAM THRUST BY THE ELECTRIC WIND MECHANISM IS GIVEN. THE ELECTRIC POWER REQUIRED FOR MAINTAINING THE DISCHARGE IS CALCULATED. WITH THESE BASIC RESULTS, THE SPECIFIC POWER REQUIREMENT OF THE ELECTRO-AERODYNAMIC DEVICES PROPOSED FOR DEFLECTING THE ONCOMING AIR OF THE SUPERSONIC TRANSPORT IS EVALUATED TO BE OF THE ORDER OF 1 WATT/DYNE (1/2 MEGAWATT/POUND FORCE). FOR 10% CHANGE OF BOOM INTENSITY BY ELECTRO-AERODYNAMIC DEFLECTION OF THE ONCOMING STREAM THRUST, A COMMERCIAL SUPERSONIC TRANSPORT REQUIRES OF THE ORDER OF THOUSANDS OF MEGAWATTS OF ELECTRIC POWER. AT THE SPECIFIC WEIGHT OF 1 POUND PER KILOWATT, CLEARLY THE ELECTRIC EQUIPMENT IS BEYOND PAYLOAD CAPABILITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 900 5/4 20/1 1/3 1/5
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM. PART I CHAPTERS I-VII, (U)

FEB 68 214P ALTREE,LILLIAN R. ;BAXTER, WILLIAM F. ;
CONTRACT: FA-67-WA-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, CHAPTERS 8-9, AD-682 901, AND PART 2, AD-682 902.

DESCRIPTORS: (*LAW, *SONIC BOOM), (*AIRCRAFT NOISE, *AIRPORTS), COSTS, DECISION MAKING, JET TRANSPORT PLANES, SUPERSONIC AIRCRAFT (U)
IDENTIFIERS: COST BENEFIT ANALYSIS, LAND USE, RIGHT OF WAY ACQUISITION, SUPERSONIC TRANSPORTS (U)

CONTENTS: INTRODUCTION; BASIC ECONOMICS; THE NATURE OF AIRPORT EXTERNALITIES; THE EFFECT OF EXTERNALITIES ON DECISION; A THEORETICAL ALLOCATION OF COSTS AND BENEFITS AND SOME PRACTICAL LIMITATIONS; TIME-LIMITED EASEMENTS; A MODEST STEP TOWARD SOLUTION; PRESENT REMEDIES FOR LOSSES CAUSED BY AIRPORT NOISE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMD9

AD- 682 901 5/4 20/1 1/3 1/5
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM.
PART I CHAPTERS VIII-IX, (U)

FEB 68 116P ALTREE,LILLIAN R. ;BAXTER,
WILLIAM F. ;
CONTRACT: FA-67-WA-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, CHAPTERS 1-7,
AD-682 900, AND PART 2, AD-682 902.

DESCRIPTORS: (*LAW, *SONIC BOOM), (*AIRCRAFT NOISE,
*AIRPORTS), COSTS, JET TRANSPORT PLANES, DECISION
MAKING, SUPERSONIC AIRCRAFT (U)
IDENTIFIERS: RIGHT OF WAY ACQUISITION, SUPERSONIC
TRANSPORTS (U)

PRESENT DIMENSIONS OF THE AIRPORT NOISE PROBLEM ARE
DELINEATED AND PROPOSED SOLUTIONS ARE PRESENTED. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 902 5/4 20/1 1/3 1/5
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM.
PART II, (U)

FEB 68 116P ALTREE,LILLIAN R. ;BAXTER,
WILLIAM F. ;
CONTRACT: FA-67-WA-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, CHAPTERS 1-7,
AD-682 900, AND PART 1, CHAPTERS 8-9, AD-682 901.

DESCRIPTORS: (*LAW, *SONIC BOOM), (*AIRCRAFT NOISE,
*AIRPORTS), DAMAGE, SUPERSONIC AIRCRAFT, JET TRANSPORT
PLANES, PSYCHOPHYSIOLOGY, COSTS (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

TOPICS INCLUDE: SONIC BOOM PRODUCTION BY
SUPERSONIC AIRPLANES; VARIATIONS IN SONIC BOOM
STRENGTH; SONIC BOOM EFFECTS; LEGAL ASPECTS OF SONIC
BOOM; INCLUDING RECOVERY FOR SONIC BOOM DAMAGE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 684 806 20/1
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C

SONIC BOOM RESEARCH (1958-1968), (U)

NOV 68 23P SANDS,JOHNNY M. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, REVIEWS), UNITED STATES GOVERNMENT, TEST FACILITIES, TEST METHODS, THEORY, REPORTS, BIBLIOGRAPHIES (U)

THE UNITED STATES GOVERNMENT HAS BEEN ACTIVELY ENGAGED IN SONIC BOOM RESEARCH SINCE 1958 IN AN EFFORT TO LEARN MORE ABOUT THIS PHENOMENON AND THE MEANS OF CONTROLLING IT. TO THIS END, EXTENSIVE TESTING HAS BEEN DONE IN THE FIELD AS WELL AS IN THE LABORATORY ENVIRONMENT. THIS DOCUMENT IS A BRIEF HISTORY OF SONIC BOOM RESEARCH. PART I PRESENTS A CHRONOLOGICAL LISTING OF THE VARIOUS FIELD RESEARCH PROGRAMS, IDENTIFIES THE GOVERNMENT AGENCIES INVOLVED AND PROVIDES A BRIEF SUMMARY OF THE WORK ACCOMPLISHED. PART II DESCRIBES SOME OF THE LABORATORY EXPERIMENTS AND THEORETICAL STUDIES CONDUCTED UNDER GOVERNMENT SPONSORSHIP. PART III CONTAINS A LISTING OF PUBLICATIONS RESULTING FROM THESE RESEARCH PROGRAMS AND TELLS HOW THESE DOCUMENTS MAY BE OBTAINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 172 20/1 19/4
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)

A NEW EXPLOSIVES TECHNIQUE FOR SYNTHESIZING A WIDE RANGE OF PRESSURE WAVEFORMS IN AIR. PART 2. THE APPLICATION OF LINEAR EXPLOSIVE CHARGES TO THE SIMULATION OF SONIC BANGS, (U)

OCT 68 31P HAWKINS,S. J. ;HICKS,J. A. ;
REPT. NO. ERDE-10/R/68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, AD-687 222.

DESCRIPTORS: (*SONIC BOOM, SIMULATION), EXPLOSIVE CHARGES, PRESSURE, DETONATION WAVES, PROPAGATION, AIRBURST, NOISE, KINETIC ENERGY, GREAT BRITAIN (U)
IDENTIFIERS: N WAVES, POINT SOURCE DISSEMINATION, WAVEFORMS (U)

THE CHARACTERISTICS OF THE SO-CALLED SONIC BANG ARE BRIEFLY REVIEWED. THE DESIRABILITY, FIELDS OF APPLICATION AND ADVANTAGES OF SONIC BANG SIMULANTS ARE CONSIDERED AND SOME POSSIBLE METHODS OF ACHIEVING SIMULATION DISCUSSED. AN ACCOUNT IS GIVEN OF THE DEVELOPMENT OF TWO TYPES OF SIMULANT USING THE PRINCIPLES OF THE EXTENDED EXPLOSIVE CHARGE TECHNIQUE DESCRIBED IN PART 1 OF THIS REPORT (ERDE 9/R/68). THEIR PROPERTIES ARE OUTLINED AND CRITERIA FOR THEIR SUITABILITY FOR DIFFERENT TYPES OF APPLICATION ARE PUT FORWARD TOGETHER WITH THE RESULTS OBTAINED ON APPLYING THESE CRITERIA TO THE TWO TYPES OF LINEAR CHARGE SIMULANT DEVELOPED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 175 20/1
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)

SOME MEASUREMENTS OF THE SONIC BANGS PRODUCED AT EXERCISE WESTMINISTER. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
OCT 68 38P HAWKINS,S. J. ;HICKS,J. A. ;
REPT. NO. ERDE-17/M/68

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, SIMULATION), MEASUREMENT, STANDARDS, EXPLOSIVES, RECORDS, STRUCTURES, SHOCK WAVES, GREAT BRITAIN (U)

OPPORTUNITY WAS TAKEN AT EXERCISE WESTMINISTER TO MAKE RECORDINGS OF SONIC BANG WAVEFORMS FOR USE AS STANDARDS OF COMPARISON BY WHICH THE EXPLOSIVELY GENERATED SIMULANT WAVEFORM UNDER DEVELOPMENT AT ERDE COULD BE JUDGED. A VARIATION OF THE SONIC BANG WAVEFORM ALONG THE AIRCRAFT TRACK, FIRST REPORTED IN THE USA, WAS OBSERVED IN THIS COUNTRY FOR THE FIRST TIME. FROM THE RECORDED WAVEFORMS, ENERGY SPECTRA AND LOUDNESS VALUES WERE COMPUTED, CORRESPONDING TO THE MEDIAN AND EXTREME FORMS OF THE VARIATION. IT IS CONCLUDED THAT (1) THE SUBJECTIVE EFFECTS OF SONIC BANGS CAN VARY MARKEDLY WITH THE LOCATION OF THE OBSERVER ALONG THE AIRCRAFT TRACK, EVEN THOUGH THE FLIGHT CONDITIONS AND LOCAL TOPOGRAPHY ARE CONSTANT, AND (2) THE ERDE MARK I EXPLOSIVE SIMULANT IS VERY SUITABLE FOR THE ASSESSMENT OF THE EFFECTS OF SONIC BANGS ON BUILDING STRUCTURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 222 19/1 19/4
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)

A NEW EXPLOSIVES TECHNIQUE FOR SYNTHESIZING A WIDE RANGE OF PRESSURE WAVEFORMS IN AIR. PART 1. APPROXIMATE THEORY OF AIR BLAST FROM EXTENDED EXPLOSIVE CHARGES. (U)

OCT 68 29P HAWKINS,S. J. ;HICKS,J. A. ;
REPT. NO. ERDE-9/R/68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 2, AD-687 172. ALSO AVAILABLE FROM MINTECH, TIL, BLOCK 'A', STATION SQUARE, ST. MARY CRAY, ORPINGTON, KENT. BR5 3RE.

DESCRIPTORS: (*EXPLOSIVE CHARGES, BLAST), SHOCK WAVES, PROPAGATION, CONFIGURATION, AIRBURST, PRESSURE, WAVEFORM GENERATORS, SONIC BOOM, HYDRODYNAMICS, GREAT BRITAIN (U)

A NEW TECHNIQUE FOR GENERATING AIR BLAST WAVES USING SPATIALLY EXTENDED EXPLOSIVE CHARGES HAS BEEN DEVISED. IT HAS BEEN FOUND TO BE CAPABLE OF SYNTHESIZING PRESSURE WAVEFORMS HAVING A WIDE RANGE OF SHAPES AND DURATIONS AND WAS APPLIED, AMONG OTHER THINGS, TO THE SIMULATION OF SONIC BANGS, THE APPLICATIONS OF THE TECHNIQUE BEING DESCRIBED SEPARATELY IN THE SECOND PART OF THE REPORT (ERDE 10/R/68). IN THIS FIRST PART OF THE REPORT A PHENOMENOLOGICAL THEORY OF THE AIR BLAST FROM SUCH CHARGES IS DEVELOPED UNDER CERTAIN SIMPLIFYING ASSUMPTIONS. THESE ASSUMPTIONS ARE FIRSTLY THAT THE GIVEN SPATIAL DISTRIBUTION OF EXPLOSIVE MAY BE REDUCED TO AN EQUIVALENT LINEAR DISTRIBUTION IN THE LINE-OF-SIGHT BY MAKING AN EXTENSION OF THE 'ENERGY HYPOTHESIS' COMMONLY APPLIED TO THE CASE OF SPHERICALLY SYMMETRIC EXPLOSIONS. SECONDLY, THIS LINEAR DISTRIBUTION IS IN TURN REGARDED AS AN INFINITE SET OF ELEMENTARY LINEAR CHARGE ELEMENTS GENERATING ACOUSTIC WAVELETS THE COMBINED EFFECTS OF WHICH ARE OBTAINED BY LINEAR SUPERPOSITION. FOR SUCH A MODEL OF THE AIR BLAST PROCESS, THE PRESSURE WAVE IN THE FAR FIELD MAY BE REPRESENTED EXACTLY IN TERMS OF AN ASSUMED SHAPE OF ELEMENT WAVEFORM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 687 491 1/3 20/1 20/4 1/1
ARA INC WEST COVINA CALIF

GAP EFFECTS OF A SHARP EDGED DELTA WING AT SUPERSONIC SPEEDS, (U)

FEB 69 58P MAZELSKY,BERNARD ;CHAO,CHIA-CHUN ;SHEN,CHENG-CHUNG ;

REPT. NO. ARA-102
CONTRACT: F44620-68-C-0027
PROJ: AF-9781
TASK: 978101
MONITOR: AFOSR 69-0846TR

UNCLASSIFIED REPORT

DESCRIPTORS: (*WING SLOTS, SONIC BOOM), (*SONIC BOOM, DELTA WINGS), (*DELTA WINGS, SUPERSONIC CHARACTERISTICS), LEADING EDGES, MODEL TESTS, LIFT, DRAG, CAMBER, REYNOLDS NUMBER, PRESSURE, SHOCK WAVES, PITCH(MOTION), SWEPTBACK WINGS, ANGLE OF ATTACK (U)
IDENTIFIERS: LIFT DRAG RATIO, SHARP BODIES (U)

SONIC BOOM MEASUREMENTS WERE CONDUCTED TO EVALUATE THE EFFECTS OF A LEADING SLAT WITH VARIOUS DEGREES OF CAMBER AND GAP SIZE BETWEEN THE SLAT AND THE MAIN WING ON A 70 DEG SWEPT DELTA WING AT SUPERSONIC SPEEDS. THE MODEL WAS SIZED FOR SONIC BOOM MEASUREMENTS IN A WIND TUNNEL. IN ADDITION TO THESE MEASUREMENTS, THE MODEL WAS INSTRUMENTED WITH SEVERAL PRESSURE TAPS FOR INDICATING THE FLOW THROUGH THE GAP. AS A SEPARATE WIND TUNNEL ENTRY, FORCE MEASUREMENTS WERE ALSO TAKEN TO INDICATE THE EFFECT OF THE CAMBERED SLAT ON THE PITCH STABILITY AND LIFT-DRAG RATIO. DUE TO THE SMALL SIZE OF THE MODEL REQUIRED TO MEASURE THE SONIC BOOM, THE GAP CONFIGURATION WAS SUCH THAT THE AIRFLOW WAS NORMAL TO THE WING SURFACE. FOR OPTIMUM LIFT AND DRAG PERFORMANCE, THE GAP SHOULD BE DESIGNED SUCH THAT THE FLOW FROM THE UPPER SURFACE SHOULD BE TANGENTIAL TO THE UPPER SURFACE. A SECOND MODEL HAS BEEN CONSTRUCTED TO EVALUATE THE LIFT-DRAG PROBLEM SEPARATELY BY INCREASING THE SIZE OF THE MODEL SUCH THAT THE PROPER GAP CONFIGURATIONS CAN BE FABRICATED. REGARDLESS OF THE NON-OPTIMIZATION OF THE GAPS, THE FOLLOWING RESULTS WERE ESTABLISHED BY THIS PHASE OF THE PROGRAM. (1) THE EFFECT OF CAMBER RESULTS IN AN INCREASE IN (L/D)MAX. (2) THE EFFECT OF REYNOLDS NUMBER ON (L/D)MAX IS NEGLIGIBLE WHEN THE GAP IS CLOSED. HOWEVER, FOR A VERY SMALL GAP, (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 689 844 20/1 5/10
STANFORD RESEARCH INST MENLO PARK CALIF

PSYCHOLOGICAL EXPERIMENTS ON SONIC BOOMS CONDUCTED AT EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: FINAL REPT.
AUG 68 119P KRYTER,K. A. ;JOHNSON,P. J. ;YOUNG,J. R. ;
CONTRACT: AF 49(638)-1758
PROJ: SRI-ETU-6065

UNCLASSIFIED REPORT

DESCRIPTORS: (•SONIC BOOM, •PSYCHOACOUSTICS), AIRCRAFT NOISE, ACCEPTABILITY, INTENSITY, AUDITORY PERCEPTION, SUBSONIC CHARACTERISTICS, SUPERSONIC AIRCRAFT, WEATHER, STRUCTURES, RESPONSE (U)

A SERIES OF TESTS WERE CONDUCTED IN JUNE 1966 AND OCTOBER 1966 TO JANUARY 1967 IN WHICH HUMAN SUBJECTS (LOCATED INDOORS AND OUTDOORS), AND SPECIAL TEST STRUCTURES WERE EXPOSED TO BOOMS FROM F-104, F-106, B-58, SR-71, AND XB-70 SUPERSONIC AIRCRAFT, AND THE NOISE FROM KC-136 AND WC-135B SUBSONIC AIRCRAFT. PHYSICAL MEASUREMENTS WERE MADE OF THE SONIC BOOM SIGNATURES, SUBSONIC AIRCRAFT NOISE, AND THE RESPONSE OF STRUCTURES TO THE BOOMS AND NOISE. PSYCHOLOGICAL MEASUREMENTS WERE MADE OF THE SUBJECTIVE ACCEPTABILITY TO SEVERAL HUNDRED SUBJECTS OF THE BOOMS AND SUBSONIC AIRCRAFT NOISE. DETAILS OF THE TEST PLAN AND PROCEDURES, AND THE RESULTS OF THE DATA ANALYZED ARE PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 691 212 20/1
STANFORD RESEARCH INST MENLO PARK CALIF

CALCULATED UNDERWATER PRESSURE LEVELS FROM SONIC BOOMS. (U)

DESCRIPTIVE NOTE: INTERIM REPT. NO. 8, DEC 67 17P SAWYERS,KENNETH N. ;
CONTRACT: AF 49(638)-1696

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMMERCIAL PLANES, SONIC BOOM), (*SOUND TRANSMISSION, UNDERWATER), SUPERSONIC AIRCRAFT, JET TRANSPORT PLANES, JET PLANE NOISE, PRESSURE (U)
IDENTIFIERS: *NOISE POLLUTION, SUPERSONIC TRANSPORTS (U)

THE UNDERWATER PRESSURE LEVELS HAVE BEEN COMPUTED FOR TWO 'TYPICAL' SONIC BOOMS WITH AMPLITUDES OF 2.5 PSF. THE BOOMS HAVE PERIODS OF 0.1 AND 0.3 SEC AND GROUND SPEEDS OF 1,500 AND 2,500 FT/SEC, RESPECTIVELY. THE COMPUTED LEVELS ARE COMPARED WITH AMBIENT LEVELS FROM VARIOUS SOURCES. IT WOULD APPEAR THAT AT FREQUENCIES TO WHICH THE ACOUSTIC RECEPTORS OF UNDERWATER ANIMALS ARE MOST SENSITIVE, THERE ARE OFTEN ACOUSTIC SIGNALS IN THE OCEAN THAT EQUAL OR EXCEED THE SIGNALS DUE TO SONIC BOOMS FALLING ON THE SURFACE OF THE OCEAN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 691 496 5/3 13/13 20/1 5/2
STANFORD RESEARCH INST MENLO PARK CALIF

REPORT ON DATA RETRIEVAL AND ANALYSIS OF USAF SONIC BOOM CLAIMS FILES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 67 183P GRUBB,C. A. ;VAN ZANDT, J. E. ;BOCKHOLT,J. L. ;
REPT. NO. TR-4
CONTRACT: AF 49(638)-1696
PROJ: SRI-ETU-5997

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, DAMAGE), (*BUILDINGS, DAMAGE), (*DAMAGE, *COSTS), (*INFORMATION RETRIEVAL, SONIC BOOM), AIR FORCE, STRUCTURAL MEMBERS, STATISTICAL ANALYSIS, URBAN AREAS, DECISION MAKING, DATA PROCESSING, GLASS (U)
IDENTIFIERS: *CLAIMS, *NOISE POLLUTION (U)

GENERALLY, ABOUT THREE-FOURTHS OF ALL ALLEGED CLAIMS FOR DAMAGE INVOLVED SINGLE FAMILY STRUCTURES. COMMERCIAL STRUCTURES ACCOUNTED FOR ONE-SIXTH OF THE CLAIMS WITH MULTIFAMILY STRUCTURES, AUTOMOBILES, MISCELLANEOUS STRUCTURES, AND PEOPLE AND ANIMALS CONSTITUTING LESS THAN 10 PERCENT. THE STRUCTURES WERE 84 PERCENT OWNER OCCUPIED, 90 PERCENT IN FAIR-TO-SOUND CONDITION, 90 PERCENT OF ONE AND TWO STORIES, AND ABOUT 50 PERCENT BUILT AFTER WORLD WAR II. GLASS, PLASTER, AND 'OTHER' TYPES OF DAMAGE WERE ALMOST EQUALLY CLAIMED IN SINGLE FAMILY RESIDENCES; HOWEVER, GLASS WAS BY FAR THE PREDOMINANT TYPE IN COMMERCIAL STRUCTURES--78 PERCENT. THE AVERAGE PAID CLAIM ALLEGED DAMAGE OF $93, THOUGH PAYMENT AVERAGED $72. OF ALL CLAIMS, THE PROPORTIONS OF SINGLE FAMILY PAID AND DENIED CLAIMS WERE ABOUT THE SAME. ON THE OTHER HAND, CLAIMS FOR COMMERCIAL AND MULTIFAMILY STRUCTURES WERE MORE LIKELY TO BE PAID--TWO TO THREE TIMES MORE LIKELY FOR COMMERCIAL ESTABLISHMENTS AND 25 TO 50 PERCENT MORE LIKELY FOR MULTIFAMILY STRUCTURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 692 340 1/3 20/1
CORNELL UNIV ITHACA N Y

REDUCTION OF SONIC BOOM BY AZIMUTHAL REDISTRIBUTION OF OVERPRESSURE, (U)

JUL 68 8P GEORGE,A. R. ;
CONTRACT: AF 49(638)-1396, NGR-33-010-054

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AIAA JNL., V7 N2 P291-298 FEB 69.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 22 MAR 68. PRESENTED AT THE AIAA/SAEROSPACE SCIENCES MEETING (6TH), NEW YORK CITY, 22-24 JAN 66 AS PAPER 68-159.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, SONIC BOOM), (*SONIC BOOM, FLOW FIELDS), SUPERSONIC FLOW, PROPAGATION, LIFT, WAKE, APPROXIMATION(MATHEMATICS), SLENDER BODIES, INTEGRAL TRANSFORMS, QUADRUPOLE MOMENT (U)

THIS PAPER ANALYZES THE POSSIBILITY OF REDISTRIBUTING PART OF THE THETA VARIATION OF A SUPERSONIC AIRCRAFT'S PRESSURE FIELD TO REDUCE THE SONIC BOOM OVERPRESSURE FELT BELOW THE AIRCRAFT. THE EFFECTS OF MULTIPOLE CONTRIBUTIONS TO THE FLOW ARE ANALYZED IN DETAIL. IT IS SHOWN THAT MULTIPOLE CONTRIBUTIONS CAN BE IMPORTANT EVEN IN THE FAR FIELD AND CONCEPTS FOR EFFICIENTLY EXCITING THEM ARE DISCUSSED. PHYSICALLY POSSIBLE MULTIPOLE DISTRIBUTIONS CAN BE USED TO REDUCE THE BOOM, BUT THE CONTRIBUTION OF LIFT TO THE BOOM CAN USUALLY BE REDUCED ALTHOUGH NEVER ELIMINATED IN THIS MANNER. THE WAVE DRAG CHANGES ASSOCIATED WITH THE FLOW MODIFICATIONS ARE ALSO TREATED. SOME SPECIFIC NUMERICAL RESULTS ARE GIVEN DEMONSTRATING BOOM REDUCTION AND WAVE DRAG CHANGES FOR A SPECIFIC SUPERSONIC TRANSPORT DESIGN. WORK STILL REMAINS TO BE DONE ON THE DETAILS OF CONFIGURATIONS TO BE USED TO PRODUCE THESE MULTIPOLE EFFECTS AND ON THEIR VORTEX AND SKIN-FRICTION DRAG. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 692 550 1/3 20/1
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR EXPLORATORY RESEARCH

LENGTHENING OF SHOCK WAVEFORMS CAUSED BY THEIR PROPAGATION TO HIGH ALTITUDES. (U)

JAN 69 1P DANIELS,FRED B. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL SOCIETY OF AMERICA, V45 N1 P241-242 JAN 69.

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, SUPERSONIC FLIGHT), (*SONIC BOOM, SHOCK WAVES), ACOUSTICS, PROPAGATION, UPPER ATMOSPHERE, NUMERICAL ANALYSIS, SOUND (U)
IDENTIFIERS: N WAVES (U)

EXPRESSIONS ARE GIVEN FOR THE LENGTHENING OF SHOCK WAVEFORMS THAT IS CAUSED BY THEIR TRAVEL UPWARDS TO HIGH ALTITUDES. NUMERICAL VALUES ARE COMPUTED FOR SPECIFIC EXAMPLES AND PRONOUNCED LENGTHENING OF THE WAVEFORM IS FOUND TO OCCUR. IN PARTICULAR, THE N WAVE FROM A SUPERSONIC TRANSPORT (SST) IS LENGTHENED TO A POINT WHERE IT MAY BE A SOURCE OF INTERFERENCE TO GEOPHYSICISTS OBSERVING INFRASOUND OF NATURAL ORIGIN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 693 132 8/13 8/11 20/1
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS

ON THE APPLICATION OF AIR-COUPLED SEISMIC WAVES. (U)

DESCRIPTIVE NOTE: ENVIRONMENTAL RESEARCH PAPERS NO. 302, JUL 69 43P CROWLEY,FRANCIS A. ;OSSING, HENRY A. ;
REPT. NO. AFCRL-69-0312
PROJ: AF-7639
TASK: 763904

UNCLASSIFIED REPORT

DESCRIPTORS: (*ROCKET ENGINE NOISE, *SEISMIC WAVES), (*SEISMIC WAVES, SOILS), (*LANDING FIELDS, CRACK PROPAGATION), PLAYAS, CRACKS, SONIC BOOM, AIRBURST, LANDING FIELDS, SOIL MECHANICS (U)
IDENTIFIERS: F-1 ENGINES (U)

SEISMIC MEASUREMENTS TAKEN ON ROGERS LAKE PLAYA, EDWARDS AFB, CALIFORNIA, WERE PROMPTED BY A CONCERN THAT GROUND VIBRATIONS EXCITED BY F-1 ROCKET ENGINES MIGHT AFFECT THE ROLE OF PLAYA CRACKING. THESE MEASUREMENTS RELATE TO OTHER AIR FORCE INTERESTS. SPECIFICALLY, THE NOTE CHARACTERIZES SEISMIC WAVES EXCITED BY F-1 ROCKETS, SONIC BOOMS, AND ATMOSPHERIC EXPLOSIONS TO: (1) PLAYA LANDING AREAS; (2) GROUND CONDITIONS AFFECTING SONIC BOOMS AND ROCKET FIRINGS SENSED IN BUILDINGS; (3) DETECTION OF ACCOUSTIC SOURCES USING SEISMIC SYSTEMS; (4) THE PLAYA'S SELECTIVE DISTORTION OF ACOUSTIC WAVE CHARACTERISTICS; AND (5) CONSIDERATION OF A PLAYA SEISMIC ALARM SYSTEM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 693 964 20/1 1/3
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

AGARD MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC BOOM,' FRENCH-GERMAN RESEARCH INSTITUTE, ST. LOUIS, FRANCE. (U)

DESCRIPTIVE NOTE: CONFERENCE REPT.,
AUG 69 21P BOVERIE,RICHARD T. ;
REPT. NO. ONRL-C-11-69

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRPLANE ENGINE NOISE, *SYMPOSIA), (*SONIC BOOM, SYMPOSIA), SOUND TRANSMISSION, REDUCTION, BUILDINGS, DAMAGE, JET ENGINE NOISE, SHOCK WAVES, PROPAGATION, TURBOFAN ENGINES, SIMULATION (U)
IDENTIFIERS: NOISE POLLUTION (U)

AN ANNOTATED LISTING IS GIVEN OF PAPERS PRESENTED DURING THE FOLLOWING SEVEN SESSIONS: SURVEY AND REVIEW PAPERS; ENGINE NOISE GENERATION; SONIC BOOM--GENERATION AND PROPAGATION; ENGINE NOISE REDUCTION; ENGINE NOISE; SONIC BOOM; REAL AIRCRAFT NOISE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 697 190 20/1 21/5 1/3
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

AIRCRAFT ENGINE NOISE AND SONIC BOOM. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS.
MAY 69 565P
REPT. NO. AGARD-CP-42

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE JOINT MEETING OF THE FLUID DYNAMICS PANEL AND PROPULSION AND ENERGETICS PANEL (33RD), SAINT-LOUIS, FRANCE, 27-30 MAY 69. NATO FURNISHED.

DESCRIPTORS: (*AIRPLANE ENGINE NOISE, *SYMPOSIA), (*SONIC BOOM, SYMPOSIA), (*AIRCRAFT NOISE, SYMPOSIA), TURBOFAN ENGINES, REDUCTION, AIRPORTS, DESIGN, PSYCHOPHYSIOLOGY, SHOCK WAVES, JET PLANE NOISE, ATMOSPHERES, SIMULATION, JET TRANSPORT PLANES (U)
IDENTIFIERS: C-5 AIRCRAFT, C-5A AIRCRAFT (U)

THE REPORT INCLUDES: REVIEW PAPERS DEVOTED RESPECTIVELY TO THE PHYSICS OF NOISE, SOME LEGAL PROBLEMS RELATING TO SONIC BOOM, AIRPORT DESIGN AND OPERATION FOR MINIMIZING EXPOSURE TO NOISE, THE EFFECTS OF AIRCRAFT NOISE AND SONIC BOOM ON GROUND STRUCTURES, HUMAN RESPONSE TO SONIC BOOMS, AND SPECIALIZED ASPECTS, THEORETICAL AND EXPERIMENTAL, OF AIRCRAFT ENGINE NOISE OR SONIC BOOM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 697 678 1/3 5/3
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF SUPERSONIC TRANSPORT DEVELOPMENT

SUMMARY OF CURRENT ECONOMIC STUDIES OF THE UNITED STATES SUPERSONIC TRANSPORT. (U)

SEP 69 50P

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERSONIC AIRCRAFT, *ECONOMICS), (*JET TRANSPORT PLANES, *COMMERCIAL PLANES), AIR TRAFFIC, AIR TRANSPORTATION, AIRCRAFT INDUSTRY, PREDICTIONS, SONIC BOOM, FEASIBILITY STUDIES (U)
IDENTIFIERS: INVESTMENT RETURNS, *SUPERSONIC TRANSPORTS (U)

THE THREE STUDIES DISCUSSED IN THE REPORT PROVIDE A RANGE IN THEIR BASE CASE 1990 MARKET ESTIMATES FOR THE SST UNDER SONIC BOOM RESTRICTIONS FROM 500 TO 800 AIRPLANES. THE LOW MARKET ESTIMATE OF 500 SST'S, THE FAA BASE CASE, IS SUFFICIENT TO ENABLE THE GOVERNMENT TO RECOVER ALL OF ITS INVESTMENT FOR DEVELOPMENT AND CONSTRUCTION OF TWO PROTOTYPES PLUS A SMALL RETURN. THE BASIC CONCLUSION IS THAT THE PROGRAM IS NOT ONLY ECONOMICALLY VIABLE BUT REASONABLY PROFITABLE TO ALL PARTICIPANTS OVER A WIDE RANGE OF ASSUMPTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 698 398 5/4 20/1 1/3
SANTA CLARA UNIV CALIF

THE ROAR, THE WHINE, THE BOOM AND THE LAW: SOME LEGAL CONCERNS ABOUT THE SST, (U)

69 40P HUARD,LEO A. ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN SANTA CLARA LAWYER, V9 N2 P189-226 1969.
SUPPLEMENTARY NOTE: SPONSORED BY NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON. D. C.

DESCRIPTORS: (*LAW, *SONIC BOOM), (*JET TRANSPORT PLANES, *COMMERCIAL PLANES), (*SUPERSONIC AIRCRAFT, LAW), JET PLANE NOISE, JET ENGINE NOISE, AIRPORTS, AIRCRAFT INDUSTRY, REACTION(PSYCHOLOGY) (U)
IDENTIFIERS: NOISE POLLUTION, *SUPERSONIC TRANSPORTS (U)

THE INQUIRY SHOWS THAT SUPERSONIC AIRPLANES MAY BRING ABOUT A CHANGE IN THE QUANTITY OF AIRPORT NOISE, BUT THEY ARE NOT LIKELY TO AFFECT THE QUALITY OF THAT NOISE. IT SEEMS UNLIKELY THAT THE SSTS WILL TRIGGER RADICAL REFORMS IN THE LEGAL RULES APPLICABLE TO AIRPORT NOISE, BECAUSE THEY SIMPLY WILL NOT MAKE A RADICAL PHYSICAL CHANGE IN SUCH NOISE. THE AIRPORT NOISE PROBLEM CRIES OUT FOR A CURE WITHOUT THE SST, AND THE ADVENT OF THAT TYPE OF AIRCRAFT WILL NOT IMPROVE THE SITUATION, BUT IT WILL NOT MAKE IT MUCH WORSE EITHER. REFORM OF 'AIRPORT' LAW WILL NOT FIND ITS RAISON D'ETRE IN THE SST AND REFORMERS MUST SEEK THEIR IMPETUS ELSEWHERE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 699 657 20/1
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

AERODYNAMIC NOISE, (U)

69 45lP RIBNER,H. S. ;
CONTRACT: AF-AFOSR-1423-68
MONITOR: AFOSR 70-0177TR

UNCLASSIFIED REPORT
AVAILABILITY: PAPER COPY AVAILABLE FROM TORONTO UNIV. (ONTARIO). $15.00.
SUPPLEMENTARY NOTE: PRESENTED AT THE PROCEEDINGS OF AFOSR-UTIAS SYMPOSIUM, TORONTO (ONTARIO), 20-21 MAY 68.

DESCRIPTORS: (*AERODYNAMIC NOISE, *SYMPOSIA), JETS, BOUNDARY LAYER, AXIALLY SYMMETRIC FLOW, PRESSURE, IMPACT, PANELS, ATMOSPHERES, DUCTS, SHOCK WAVES, AIRPLANE ENGINE NOISE, PROPELLER NOISE, SONIC BOOM, CANADA (U)
IDENTIFIERS: NOISE POLLUTION (U)

CONTENTS: JETS AND NOISE; THE DEVELOPMENT OF ENGINEERING PRACTICES IN JET, COMPRESSOR, AND BOUNDARY LAYER NOISE; SCALES PERTINENT TO NOISE GENERATION FROM A JET; ESTIMATION OF THE INTENSITY OF NOISE RADIATED FROM A SUBSONIC CIRCULAR JET; GENERAL METHOD FOR CALCULATING THE SOUND PRESSURE FIELD EMITTED BY STATIONARY OR MOVING JETS; JET NOISE AT VERY LOW AND VERY HIGH SPEED; AN INVESTIGATION OF THE NEAR NOISE FIELDS OF A CHOKED AXI-SYMMETRIC AIR JET; NOISE FROM UNDEREXPANDED AXISYMMETRIC JET FLOWS USING RADIAL JET FLOW IMPINGEMENT; THE RESPONSE OF A SIMPLE PANEL TO THE PSEUDO-SOUND FIELD OF A JET; ATMOSPHERIC ABSORPTION OF NOISE; ATTENUATION OF SOUND IN SOFT-WALLED CIRCULAR DUCTS; FLOW PERTURBATIONS GENERATED BY A SHOCK WAVE INTERACTING WITH A ENTROPY WAVE; TRENDS IN BOUNDARY LAYER NOISE RESEARCH; A REVIEW OF THE SOUND-GENERATING MECHANISMS IN AIRCRAFT-ENGINE FANS AND COMPRESSORS; DISCRETE NOISE GENERATION AND PROPAGATION BY A FAN ENGINE; A THEORETICAL STUDY OF HELICOPTER ROTOR NOISE; A STUDY OF PROPELLER NOISE RESEARCH; REVIEW OF SONIC BOOM THEORY; RECENT RESULTS OF SONIC BOOM RESEARCH; SONIC BANG SIMULATION BY EXPLOSIVES; SECOND-ORDER WAVE STRUCTURE--PLANAR FLOWS; AND LIFTING AERODYNAMIC CONFIGURATIONS WITH NO SONIC BOOM. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 699 915 20/1 1/2
DEPARTMENT OF TRANSPORTATION WASHINGTON D C LIBRARY SERVICES DIV

AIRCRAFT NOISE AND SONIC BOOM. SELECTED REFERENCES. (U)

DEC 69 46P
REPT. NO. BIBLIOGRAPHIC LIST-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *BIBLIOGRAPHIES), (*AIRCRAFT NOISE, BIBLIOGRAPHIES), MEASUREMENT, CONTROL, REDUCTION, STRUCTURES, RESPONSE, REACTION(PSYCHOLOGY), AIRPLANE ENGINE NOISE, LAW (U)
IDENTIFIERS: *NOISE POLLUTION (U)

CONTENTS: BIBLIOGRAPHIES; AIRCRAFT NOISE (GENERAL, MEASUREMENT, CONTROL, HUMAN RESPONSE); SONIC BOOM (GENERAL, GENERATION AND PROPAGATION, REDUCTION, HUMAN RESPONSE, STRUCTURAL RESPONSE, MISCELLANEOUS EFFECTS); LEGAL ASPECTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 700 225 20/1 1/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

TECHNICAL EVALUATION REPORT ON AGARD SPECIALISTS' MEETING ON AIRCRAFT ENGINE NOISE AND SONIC BOOM, (U)

JAN 70 9P SEARS,W. R. ;
REPT. NO. AGARD-ADVISORY-22

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (*AIRPLANE ENGINE NOISE, REVIEWS), (*SONIC BOOM, REVIEWS), AERODYNAMIC NOISE, REDUCTION, ENGINE NOISE, DESIGN (U)
IDENTIFIERS: EVALUATION (U)

THE MEETING JUSTIFIED THE TERM 'SPECIALISTS' IN ITS TITLE. ONE RECEIVED THE IMPRESSION THAT ALL PRESENT WERE TRULY KNOWLEDGEABLE IN THIS IMPORTANT FIELD OF TECHNOLOGY AND THAT THEIR EXPERTISE SPANNED A BROAD RANGE FROM THE HIGHLY MATHEMATICAL TO THE SEVERELY PRACTICAL. THE MIXING OF PROPULSION AND FLUID-DYNAMICS SPECIALISTS WAS EMINENTLY SUCCESSFUL; THE DIVIDING LINE BETWEEN THE CATEGORIES WAS NEVER VISIBLE. CLEARLY, MUCH IMPORTANT INFORMATION WAS EXCHANGED THROUGHOUT THE MEETING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 701 854 20/4 20/1 1/1
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V AACHEN (WEST GERMANY)

DIE THEORIE DER KNALLAUSBREITUNG IN EINER GESCHICHTETEN ATMOSPHAERE (THE THEORY OF SHOCK WAVE PROPAGATION IN AN ISOTHERMAL ATMOSPHERE). (U)

OCT 68 11P STUFF,R. ;
REPT. NO. DFVLR-SONDERDRUCK-2

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER FLUGWISSENSCHAFTEN, V17 N5 P156-164 1969. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: TEXT IN GERMAN.

DESCRIPTORS: (*SHOCK WAVES, PROPAGATION), (*SONIC BOOM, MATHEMATICAL ANALYSIS), ACCELERATION, AXIALLY SYMMETRIC FLOW, DAMPING, WEST GERMANY (U)

THE CHARACTERISTIC METHOD BY K. OSWATITSCH IS MODIFIED WITH RESPECT TO THE CALCULATION OF SHOCK WAVES FROM ACCELERATED, DECELERATED AND NON ACCELERATED AXISYMMETRIC BODIES IN AN ISOTHERMAL ATMOSPHERE. FORMULAS FOR THE SONIC BANGS OF ANY AIRCRAFT ARE OBTAINED. THE EXPLICIT FORMULAS YIELD SATISFYING RESULTS FROM A DISTANCE OF TWENTY BODY LENGTHS UP TO INFINITY, WHEREAS THE FORMULAS BY G. B. WHITHAM GIVE SUFFICIENTLY EXACT RESULTS ONLY FROM A DISTANCE OF THOUSAND BODY LENGTHS. IN STATIONARY FLIGHT THE SHOCKS ARE DAMPED WITH AN ERROR FUNCTION AND NOT AS USUALLY ASSUMED WITH THE 3/4 POWER OF THE DISTANCE. FURTHER, THE DAMPING OF THE SHOCK WAVES DEPENDS THE MORE ON THE ACCELERATION OR DECELERATION, THE LARGER THE DISTANCE FROM THE BODY AND THE CLOSER THE VELOCITY TO THE SPEED OF SOUND. THE ISOTHERMAL ATMOSPHERE INFLUENCES THE SHOCK STRENGTH WITH INCREASING DISTANCE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 702 378 20/1 13/13
NORTHWESTERN UNIV EVANSTON ILL DEPT OF CIVIL ENGINEERING

RESPONSE OF STRUCTURES SUBJECTED TO SONIC BOOMS, (U)

68 10P HERRMANN,GEORGE ;KRAJCINOVIC, DUSAN ;

CONTRACT: AF-AFOSR-100-67
PROJ: AF-9782
TASK: 978201
MONITOR: AFOSR 70-0641TR

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN PROCEEDINGS OF THE INTERNATIONAL ASSOCIATION FOR BRIDGE AND STRUCTURAL ENGINEERING CONGRESS (8TH) NEW YORK, N. Y. 9-14 SEP 68, P1149-1155.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH INGERSOLL-RAND RESEARCH CENTER, PRINCETON, N. J.

DESCRIPTORS: (*SONIC BOOM, DAMAGE), (*STRUCTURES, RESPONSE), AERODYNAMIC LOADING, PRESSURE, VIBRATION, BEAMS(STRUCTURAL), RESONANT FREQUENCY, DIFFERENTIAL EQUATIONS (U)

IT IS SUGGESTED THAT THE LOADING ON STRUCTURES INDUCED BY THE SONIC BOOM GENERATED BY SUPERSONIC AIRCRAFT CAN BE REPRESENTED BY A DIPOLE IN TIME. THE TERM 'BIPULSE' IS INTRODUCED FOR THIS TYPE OF TRANSIENT LOADING. IT IS SHOWN THAT SIMPLE STRUCTURES SUBJECTED TO SUCH BIPULSE LOADING MAY BE CONVENIENTLY ANALYZED AND THE RESPONSE READILY COMPARED WITH THAT DUE TO OTHER TYPES OF DYNAMIC EFFECTS SUCH AS, FOR EXAMPLE, STEP LOADING AND IMPULSIVE LOADING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 704 606 13/13 20/1
STANFORD RESEARCH INST MENLO PARK CALIF

RESPONSE OF WINDOWS TO SONIC BOOMS. (U)

DESCRIPTIVE NOTE: INTERIM TECHNICAL REPT. NO. 7,
JUN 67 115P SEAMAN,L. ;
CONTRACT: AF 49(638)-1696
PROJ: SRI-ETU-5897

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, STRUCTURES), (*STRUCTURAL MEMBERS, AERODYNAMIC LOADING), (*GLASS, RUPTURE), RESPONSE, PRESSURE, STRESSES, DEFLECTION, MATHEMATICAL PREDICTION (U)
IDENTIFIERS: *WINDOWS, *WINDOW GLASS (U)

A METHOD FOR CALCULATING THE RESPONSE OF SIMPLY SUPPORTED WINDOWS TO SONIC BOOMS WAS DEVELOPED. THE PROCEDURE IS BASED ON A LINEAR ONE-DEGREE-OF-FREEDOM ANALYSIS PLUS ESTIMATES OF THE IMPORTANCE OF NONLINEAR AND MULTIMODAL EFFECTS. EFFECTS OF STRESS RAISERS AND OF MOVEMENT FOLLOWED BY IMPACT OF LOOSE WINDOWS ARE NOT CONSIDERED. SIGNIFICANT CONTRIBUTIONS TO THE MAXIMUM STRESS IN WINDOWS SUBJECTED TO 2 PSF SONIC BOOMS ARE MADE BY LARGE DEFLECTIONS (NONLINEARITIES), MODES ABOVE THE FUNDAMENTAL, AND THE INTERNAL PRESSURE BUILT UP IN THE BUILDING BY THE BOOM. AN ATTEMPT TO ESTIMATE STATISTICALLY THE OCCURRENCE OF WINDOW FAILURE UNDER 2 PSF BOOMS WAS FRUSTRATED BY THE LACK OF PRECISE KNOWLEDGE OF THE STATISTICAL DISTRIBUTION OF GLASS STRENGTH. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 709 514 20/1
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V AACHEN (WEST GERMANY)

DIE VERTIKALE AUSBREITUNG VON EBENEN STOßWELLEN IN EINER SCHWEREGESCHICHTETEN ATMOSPHAERE MIT EINEM TEMPERATURGRADIENTEN (THE VERTICAL PROPAGATION OF HOMOGENEOUS SHOCK WAVES IN A HEAVILY STRATIFIED ATMOSPHERE WITH TEMPERATURE GRADIENTS). (U)

NOV 69 6P STUFF,ROLAND ;

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER FLUGWISSENSCHAFTEN, V18 N2/3 P80-83 1970. NO COPIES FURNISHED.
SUPPLEMENTARY NOTE: TEXT IN GERMAN, ATTACHED SUMMARY IN ENGLISH.

DESCRIPTORS: (*SHOCK WAVES, PROPAGATION), VELOCITY, PERTURBATION THEORY, ATMOSPHERIC TEMPERATURE, WEST GERMANY, SONIC BOOM (U)

AN ANALYTIC SOLUTION IS FOUND FOR A PLANE ACOUSTIC WAVE MOVING UP- AND DOWNWARD IN A POLYTROPIC ATMOSPHERE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 710 888 20/1 1/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

TECHNICAL EVALUATION REPORT ON AGARD SPECIALISTS' MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC BOOM'. (U)

DESCRIPTIVE NOTE: ADVISORY REPT.,
JUN 70 8P POWERS,JOHN O. (PIANKO,M.

REPT. NO. AGARD-AR-26-70

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. SEE ALSO AD-700 225.

DESCRIPTORS: (*AIRPLANE ENGINE NOISE, *REVIEWS), (*SONIC BOOM, REVIEWS), AERODYNAMIC NOISE, FANS, COMPRESSOR NOISE, SOURCES, DESIGN, CONTROL, REDUCTION (U)

CONTENTS: AIRCRAFT NOISE SOURCE; NOISE PREDICTION; JET NOISE SOURCE; FAN AND COMPRESSOR NOISE SOURCE; DESIGN FOR NOISE SOURCE CONTROL; ACOUSTIC PATH CONTROL; ACOUSTIC IMPACT ON RECEIVER. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 124 20/1
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

SONIC BOOM MODELING INVESTIGATION OF TOPOGRAPHICAL AND ATMOSPHERIC EFFECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 69-JUL 70,
JUL 70 214P BAUER,A. B. ;BAGLEY,C. J. ;
REPT. NO. MDC-J0734/01
CONTRACT: FA-69-WA-2114
MONITOR: FAA-NO 70-10

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *ATMOSPHERIC MOTION), (*TERRAIN, SONIC BOOM), GEOMETRIC FORMS, TURBULENCE, INTERACTIONS, JETS, MATHEMATICAL MODELS (U)

AN EXPERIMENTAL PROGRAM WAS UNDERTAKEN TO STUDY THE EFFECTS OF TOPOGRAPHICAL AND STRUCTURAL SHAPES ON SONIC BOOM FOCUSING AND TO STUDY THE EFFECTS OF ATMOSPHERIC TURBULENCE ON SONIC BOOM SIGNATURES. THESE EFFECTS WERE MODELED BY FIRING PROJECTILES AND BY ALLOWING THE PROJECTILE N WAVES TO INTERACT WITH MODEL SHAPES AND WITH TURBULENT JETS. THE WAVE INTERACTIONS WERE STUDIED BY MEANS OF SHADOWGRAPH PICTURES AND MICROPHONE PRESSURE RECORDS. THE BOOM FOCUSING PARAMETERS WERE RELATED TO THE WORK OF TING AND PAN. A CANYON MODEL SHOWED WAVE AMPLIFICATION FACTORS AS LARGE AS 14 FOR A SPECIAL SHAPE AND A PARTICULAR WAVE DIRECTION OF PROPAGATION. A LARGE AMOUNT OF STATISTICAL INFORMATION WAS OBTAINED FROM THE TURBULENCE INTERACTIONS. THIS INFORMATION WAS STUDIED AND FOUND TO BE IN ESSENTIAL AGREEMENT WITH THE THEORY OF CREW, BUT THE MECHANISMS OF THE SHOCK FRONT BREAKUP AND OF CERTAIN NONLINEAR FEATURES ARE NOT UNDERSTOOD. TURBULENCE SCALING PARAMETERS ARE DEVELOPED AND USED TO RELATE THE MODEL RESULTS TO FULL SCALE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 516 20/1
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

EFFECT OF GROUND REFLECTIVE AND OTHER MICROPHONE MOUNTING CONDITIONS ON SONIC BOOM MEASUREMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAY 70 72P ABELE,MANLIO ;TOMBOULIAN, ROGER ;PESCHKE,WILLIAM ;DANTUONO,DANIEL ;
CONTRACT: DOT-FA6[illegible]-2185
MONITOR: FAA-ND 70-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, MEASUREMENT); REFLECTIVITY, SURFACE PROPERTIES, MICROPHONES, SOILS, ASPHALT, GLASS TEXTILES (U)

AN INVESTIGATION OF THE EFFECTS OF VARIOUS GROUND SURFACES ON THE CHARACTER OF A REFLECTED N-WAVE WAS PERFORMED. THE RESPONSE OF AN FAA FIELD TEST MICROPHONE WAS COMPARED WITH THAT OF A STANDARD CONDENSER MICROPHONE AND THE RESPONSE CAPABILITY OF AN FAA TRANSIENT DATA RECORDER WAS DETERMINED. THE EFFECT OF MICROPHONE HEIGHT AND WAVE INCIDENCE ANGLE WITH RESPECT TO BOTH A RIGID REFERENCE SURFACE AND SEVERAL GROUND SURFACES WAS EVALUATED IN A SONIC BOOM SIMULATOR. THE GROUND SURFACES TESTED INCLUDED ASPHALT, MEDIUM DENSITY GRASS, SPADED SOIL, COARSE AGGREGATE, ETC. TWO DIFFERENT N-WAVE SIGNATURES WERE USED IN THE TESTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 963 20/1
HYDROSPACE RESEARCH CORP ROCKVILLE MD

PENETRATION OF SONIC BOOM ENERGY INTO THE OCEAN: AN EXPERIMENTAL SIMULATION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 70 56P WATERS,JOHN F. ;GLASS,RAY E. ;
REPT. NO. HRC-TR-288
CONTRACT: N00014-70-C-0374, FA-70-WAI-185

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEA WATER, ACOUSTIC PROPERTIES), (*SONIC BOOM, SEA WATER), (*CIVIL AVIATION, SUPERSONIC AIRCRAFT), SIMULATION, HYDROPHONES, ABSORPTION, SHOCK WAVES, PRESSURE, ECOLOGY, EXPLOSIVE CHARGES, REFLECTION, MATHEMATICAL PREDICTION (U)
IDENTIFIERS: *AMBIENT NOISE (U)

PENETRATION OF SOUND INTO A BODY OF WATER FROM A SIMULATED AIRBORNE SONIC BOOM WAS MEASURED IN AN ACOUSTICALLY SCALED EXPERIMENT. DYNAMITE CAPS WERE USED TO PRODUCE SPHERICALLY SPREADING N-WAVES WHICH IMPINGED UPON THE WATER. MICROPHONES AT THE WATER SURFACE AND HYDROPHONES AT VARIOUS SHALLOW DEPTHS WERE USED TO MEASURE THE EXPONENTIALLY ATTENUATING PENETRATION OF THE AIRBORNE PRESSURE FIELD INTO THE WATER, UNDER TOTAL REFLECTION CONDITIONS. AGREEMENT BETWEEN THE SCALED EXPERIMENTAL MEASUREMENTS AND PREDICTIONS BASED ON EXISTING THEORY WAS GENERALLY GOOD. APPLICATION OF THE THEORY TO THE CASE OF ACTUAL SONIC BOOMS IMPINGING UPON THE OCEAN, AND COMPARISONS WITH MEASUREMENTS OF TYPICAL DEEP-OCEAN AMBIENT NOISE, INDICATE THAT UNDERWATER SONIC BOOM NOISE WILL BE DISCERNIBLE ONLY AT VERY LOW FREQUENCIES AND AT SHALLOW DEPTHS. PRESSURE FLUCTUATION SPECTRUM LEVELS DUE TO SURFACE WAVES WILL BE HIGHER THAN LEVELS DUE TO SONIC BOOMS.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 716 830 20/1
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

LOWER BOUNDS FOR SONIC BOOM CONSIDERING THE NEGATIVE OVERPRESSURE REGION, (U)

MAY 70 4P PETTY,JAMES S. ;
REPT. NO. ARL-70-0297V
PROJ: AF-7064
TASK: 7064

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF AIRCRAFT, V7 N4 P375-377 JUL-AUG 70.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 7 JAN 70.

DESCRIPTORS: (*SONIC BOOM, MATHEMATICAL ANALYSIS), PRESSURE, SUPERSONIC AIRCRAFT, JET TRANSPORT PLANES, THEORY (U)
IDENTIFIERS: OVERPRESSURE, SUPERSONIC TRANSPORTS (U)

CONSIDERATION IS GIVEN TO BOTH THE POSITIVE AND NEGATIVE PARTS OF THE OVERPRESSURE SIGNATURE IN AN ANALYSIS OF LOWER BOUND CONFIGURATIONS FROM THE NONASYMPTOTIC THEORY. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 717 193 20/1
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

CRITICAL EVALUATION OF A NONUNIFORM FLOW SONIC BOOM REDUCTION CONCEPT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. OCT 68-JUL 69, SEP 70 40P
WEEKS,THOMAS M. ;
REPT. NO. AFFDL-TR-70-65
PROJ: AF-1366
TASK: 136612

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, REDUCTION), TWO DIMENSIONAL FLOW, FLOW FIELDS, JETS, FLAT PLATE MODELS, LEADING EDGES, INTERACTIONS (U)
IDENTIFIERS: NONUNIFORM FLOW, EVALUATION (U)

AN INVESTIGATION WAS MADE OF A 'NONUNIFORM FLOW FIELD' SONIC BOOM ELIMINATION DEVICE. THE TWO-DIMENSIONAL FLOW FIELD CONSISTS OF A SLIT JET IMPINGING ON AN INCLINED FAT PLATE AIRFOIL. THE REPORT PRESENTS INDEPENDENT ANALYSES OF THE PROBLEM AS WELL AS A CRITIQUE OF THE ANALYSIS. THE MAJOR FINDING IS THAT ONE CAN EXPECT NO MORE THAN A 10% REDUCTION IN THE STRENGTH OF THE LEADING EDGE SHOCK WAVE AT A THOUSAND CHORD LENGTHS FROM THE PLATE WHEN COMPARED TO THE CORRESPONDING CASE WITHOUT JET FLOW (SAME CHORD AND LOWER SURFACE PRESSURE). UNDER IDENTICAL CONDITIONS, A 20% REDUCTION IS FOUND. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 718 825 20/1
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH

FINITE DIFFERENCE CALCULATION OF THE BEHAVIOR OF A DISCONTINUOUS SIGNAL NEAR A CAUSTIC. (U)

JAN 71 21P SEEBASS,R. ;MURMAN,E. M. ; KRUPP,J. A. ;
REPT. NO. D1-82-1040

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE CONFERENCE ON SONIC BOOM RESEARCH (3RD), NASA HEADQUARTERS, WASHINGTON, D. C., 29-30 OCT 70.

DESCRIPTORS: (*SONIC BOOM, WAVE PROPAGATION), TRANSONIC CHARACTERISTICS, PROPAGATION, INTERACTIONS, PRESSURE, NUMERICAL METHODS AND PROCEDURES (U)
IDENTIFIERS: OVERPRESSURE, FINITE DIFFERENCE THEORY, (U)

IT IS IMPORTANT TO PREDICT SONIC BOOM OVERPRESSURE SIGNATURES IN THE VICINITY OF A CAUSTIC. IN PARTICULAR, ONE NEEDS TO BE ABLE TO CALCULATE THE OVERPRESSURE WHEN THE CAUSTIC SURFACE INTERSECTS, OR WHEN IT IS NEAR THE GROUND. WHILE THE ANALYTICAL FORMULATION OF THIS PROBLEM IS A SIMPLE ONE, THE SOLUTION BY FORMAL MATHEMATICAL TECHNIQUES PRESENTS GREAT DIFFICULTIES. CONSEQUENTLY, THERE IS GREAT IMPETUS FOR DEVELOPING NUMERICAL TECHNIQUES THAT CAN PROVIDE SUCH PREDICTIONS. HERE THE AUTHORS REPORT ON THE EXTENSION TO THE CAUSTIC PROBLEM OF A TECHNIQUE DEVELOPED BY MURMAN AND COLE FOR TRANSONIC FLOWS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 721 010 20/1 1/3
WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF

NOISE PRIMER FOR THE SUPERSONIC TRANSPORT. (U)

MAR 71 34P
CONTRACT: FA-SS-71-9

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET PLANE NOISE, *SUPERSONIC AIRCRAFT), (*JET TRANSPORT PLANES, *COMMERCIAL PLANES), SONIC BOOM, LAW, UNITED STATES GOVERNMENT, JET ENGINE NOISE, AIRPORTS, REDUCTION, URBAN AREAS (U)
IDENTIFIERS: *NOISE POLLUTION, *SUPERSONIC TRANSPORTS (U)

THE FIRST AIM OF THE BOOKLET IS TO CLARIFY THE BASIC CONCEPTS AND TERMINOLOGY NECESSARY IN ANY DISCUSSION OF AIRPORT-COMMUNITY NOISE AND THE SST. THE SECOND AIM OF THE BOOKLET IS TO DESCRIBE THE EXPECTED NOISE OF THE PLANNED COMMERCIAL SST--USING THE TERMINOLOGY AND CONCEPTS DEVELOPED TO DESCRIBE AIRCRAFT NOISE. THIS DESCRIPTION TRIES TO PUT SST NOISE INTO PERSPECTIVE BY: SUMMARIZING THE STATUS OF THE MAJOR EFFORTS TO REDUCE SST NOISE; CLARIFYING SOME OF THE OLD NUMERICAL VALUES FOR SST NOISE WHICH HAVE CAUSED CONFUSION; COMPARING THE NOISE OF THE SST WITH THAT OF OTHER AIRPLANES IN TERMS OF CERTIFICATION NOISE LEVELS; AND SHOWING HOW THE AIRPORT-COMMUNITY NOISE FROM SST OPERATIONS FITS INTO THE NOISE PICTURE ALONG WITH THE NEW AIRPLANES OF THE FUTURE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 721 423 20/1 20/11 13/13
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)

EXPLOSIVELY GENERATED AIR PRESSURE WAVES FOR STRUCTURAL FORCING. (U)

APR 69 10P HARPER,M. J. ;HAWKINS,S. J. ;HICKS,J. A. ;
REPT. NO. ERDE-OFFPRINT-10

UNCLASSIFIED REPORT
PAPER COPY AVAILABLE FROM MINISTRY OF TECHNOLOGY REPORTS CENTRE, STATION SQUARE HOUSE, ST. MARY CRAY, ORPINGTON KENT (ENGLAND) BR5 3RE. NO COPIES FURNISHED BY DDC OR NTIS.
SUPPLEMENTARY NOTE: PUB. IN JNL. OF SOUND VIBRATIONS V11 N2 P217-224 1970.

DESCRIPTORS: (*SONIC BOOM, SIMULATION), (*STRUCTURES, GUST LOADS), AIRBURST, BLAST, SHOCK WAVES, PRESSURE, INTEGRAL TRANSFORMS, GREAT BRITAIN (U)

THE AERIAL BLAST WAVE GENERATED BY A SMALL EXPLOSION MAY BE USED TO PRODUCE IMPULSIVE FORCING OF STRUCTURES WITH NATURAL PERIODS LONGER THAN APPROXIMATELY 1 MSEC; THE FREE RESPONSE OF SUCH STRUCTURES MAY THEN BE DETERMINED. A TECHNIQUE HAS BEEN DEVELOPED USING SPATIAL DISTRIBUTIONS OF EXPLOSIVE WHEREBY IT IS POSSIBLE TO GENERATE WAVES OF MUCH LONGER DURATIONS AND OF A MUCH WIDER RANGE OF SHAPES, SO THAT STUDIES OF THE FORCED RESPONSE OF STRUCTURES ARE MADE FEASIBLE. THE TECHNIQUE HAS BEEN APPLIED TO THE GENERATION OF A BLAST WAVEFORM OF THE SAME SHAPE AS THAT OF THE SONIC BANG, FOR EXAMPLE, THUS PERMITTING STUDIES OF RESPONSE TO SONIC BANGS TO BE CARRIED OUT WITHOUT THE NECESSITY OF FLYING SUPERSONIC AIRCRAFT AND WITHOUT RECOURSE TO SCALED MODEL EXPERIMENTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 721 932 20/1
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH

NONLINEAR ACOUSTIC BEHAVIOR AT A CAUSTIC,
(U)

FEB 71 52P SEEBASS,R. T
REPT. NO. D1-82-1039

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, MATHEMATICAL MODELS), SHOCK WAVES, WAVE FUNCTIONS, REFLECTION, SUPERSONIC FLIGHT, PARTIAL DIFFERENTIAL EQUATIONS, NONLINEAR SYSTEMS (U)
IDENTIFIERS: COMPUTERS, GRAPHICS (U)

THE PAPER IS CONCERNED WITH MODIFYING THE BASIC THEORY OF SONIC BOOMS TO INCLUDE NONLINEAR EFFECTS NOT PROPERLY ACCOUNTED FOR IN THE NEIGHBORHOOD OF A CAUSTIC. THE BASIC THEORY ACCOUNTS FOR NONLINEAR EFFECTS ON THE PROPAGATION OF THE PRESSURE SIGNAL DOWN A RAY TUBE, BUT THE CONCEPT OF RAY TUBES IS A LINEAR ONE. THE ENVELOPE OF THE RAYS IS A CAUSTIC SURFACE; THIS SURFACE IS THE LOCUS OF CUSPS IN THE ACOUSTIC WAVE FRONTS. INTEREST IS IN THE DETAILED STRUCTURE OF THE WAVE FRONT AS IT REFLECTS AT A CAUSTIC SURFACE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 723 112 11/2 20/1
WYLE LABS HUNTSVILLE ALA

AN EXPERIMENTAL STUDY TO DETERMINE THE EFFECTS OF REPETITIVE SONIC BOOMS ON GLASS BREAKAGE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 70 84P KAO,GEORGE C. ;
REPT. NO. WR-70-11
CONTRACT: FA-69-WA-2204
MONITOR: FAA-NO 70-13

UNCLASSIFIED REPORT

DESCRIPTORS: (*GLASS, VULNERABILITY), (*SONIC BOOM, GLASS), BRITTLENESS, PREDICTIONS, SUPERSONIC FLIGHT, EXPERIMENTAL DATA, TEST METHODS, DAMAGE ASSESSMENT, MODELS(SIMULATIONS) (U)

A PNEUMATIC PISTONPHONE SIMULATOR, DEVELOPED BY WYLE LABORATORIES, WAS USED UNDER THE PRESENT CONTRACT TO EXPERIMENTALLY DETERMINE DAMAGE POTENTIAL TO SINGLE STRENGTH GLASS SPECIMENS WHEN EXPOSED TO REPETITIVE SONIC BOOMS. THE GLASS SPECIMEN DIMENSIONS WERE TYPICALLY 48 INCH X 48 INCH X 3/32 INCH. IN THESE EXPERIMENTS, PARTICULAR EMPHASIS WAS PLACED ON THE CUMULATIVE DAMAGE FROM A LARGE NUMBER OF BOOMS. PRELIMINARY STATIC STRENGTH TESTS WERE CONDUCTED ON TWO SIZES OF NEW (PREVIOUSLY UNUSED) SINGLE STRENGTH GLASS TO DETERMINE MEAN VALUES AND PROBABILITY DISTRIBUTIONS OF INCIPIENT FAILURE PRESSURES, AND A FEW SUCH TESTS WERE ALSO CONDUCTED FOR USED (SCRATCHED AND WEATHERED) GLASS SPECIMENS. AS A BY-PRODUCT, THESE TESTS YIELDED DATA REGARDING NONLINEAR STIFFNESS CHARACTERISTICS OF GLASS PANES AND THE EFFECTS OF BOUNDARY CONDITIONS ON THIS STIFFNESS. ALTHOUGH THE TEST DATA ARE LIMITED, RESULTS INDICATE THAT SONIC BOOM OVERPRESSURES REQUIRED TO CAUSE INCIPIENT FAILURE ARE NEARLY COMPARABLE TO STATIC FAILURE PRESSURES, AND THE PROBABILITY OF GLASS FAILURE AT REALISTIC SONIC BOOM OVERPRESSURES IS QUITE SMALL FOR PROPERLY MOUNTED NEW GLASS. FURTHER EXPERIMENTS WILL BE REQUIRED TO VALIDATE AND EXTEND THESE RESULTS. A PRELIMINARY GLASS NEIGHBORHOOD SURVEY WAS CONDUCTED TO DETERMINE BREAKAGE RATES UNDER NATURAL ENVIRONMENTS; HOWEVER, BECAUSE OF THE SMALL SAMPLE SIZE, THE GLASS BREAKAGE STATISTICS OBTAINED WERE OF LIMITED VALUE IN FORMULATING A REALISTIC BREAKAGE PROBABILITY MODEL. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 723 339 20/1 14/2 1/3
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

SONIC BOOM MODELING INVESTIGATION OF TOPOGRAPHIC AND ATMOSPHERIC EFFECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 69-APR 70,
APR 70 157P PESCHKE,WILLIAM ;SLUTSKY,
SIMON ;DANTUONO,DANIEL ;
CONTRACT: DOT-FA69WA-2113
MONITOR: FAA 70-12

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, MODEL TESTS), (*SUPERSONIC AIRCRAFT, SONIC BOOM), ATMOSPHERES, INTERACTIONS, TERRAIN, TEST FACILITIES, ACOUSTIC HORNS, GAS FLOW, THERMAL PROPERTIES, MICROPHONES, TURBULENCE, PRESSURE, DIFFRACTION, MATHEMATICAL PREDICTION, MODELS(SIMULATIONS) (U)
IDENTIFIERS: OVERPRESSURE, GRAPHS(CHARTS) (U)

THE EFFECTS OF SONIC BOOM INTERACTION WITH SEVERAL TOPOGRAPHIC CONFIGURATIONS AND WITH INERTIAL AND THERMAL TURBULENCE HAVE BEEN INVESTIGATED IN REDUCED SCALE UTILIZING AN ACOUSTIC HORN TYPE TEST FACILITY. OPERATIONS OF THE FACILITY AND THE SPECIFIC MODIFICATIONS REQUIRED TO GENERATE THE INERTIAL AND THERMAL TURBULENCE ARE DESIRED. EIGHT TOPOGRAPHIC MODEL CONFIGURATIONS WERE TESTED OVER A RANGE OF MODEL ORIENTATIONS AND WAVE INCIDENCE ANGLES CORRESPONDING TO MACH NUMBERS RANGING BETWEEN 1.0 AND 1.4. REGIONS OF SIGNIFICANT OVER-PRESSURE ON THE MODEL SURFACE, ARISING AS A CONSEQUENCE OF WAVE REFLECTION PHENOMENA WERE STUDIED IN PARTICULAR. GOOD AGREEMENT, BOTH AS TO THE MAGNITUDE OF THE OVER-PRESSURE AND THE TIME OF OCCURRENCE OF THE PRESSURE PEAKS, WAS OBTAINED WITH THE PREDICTIONS OF LINEAR ACOUSTIC THEORY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 723 579 20/1 1/2
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS RESEARCH AND DEVELOPMENT SERVICE

AIRCRAFT NOISE STANDARDS AND REGULATIONS. (U)

DESCRIPTIVE NOTE: SPEECH REPT. MAR-APR 71, APR 71 74P POWER,JOSEPH K. ;
REPT. NO. FAA-RD-71-24

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET PLANE NOISE, *STANDARDS), (*UNITED STATES GOVERNMENT, CIVIL AVIATION), JET ENGINE NOISE, SONIC BOOM, TAKEOFF, AIRCRAFT LANDINGS, AIRPORTS, TOLERANCES(PHYSIOLOGY) (U)

THE PAPER DISCUSSES PUBLIC LAW 90-411 AND FAR PART 36 OF FEDERAL REGULATIONS. NOISE EXPOSURE FORECASTS AND VARIOUS SYSTEMS FOR RATING AIRCRAFT NOISE WORLD-WIDE ARE PRESENTED. NOISE CERTIFICATION AND AIRCRAFT RETROFIT REGULATIONS ARE DISCUSSED AS WELL AS AIRCRAFT OPERATIONAL PROCEDURES TO REDUCE NOISE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 724 344 20/1
CATHOLIC UNIV OF AMERICA WASHINGTON D C INST OF OCEAN SCIENCE AND ENGINEERING

A LITERATURE SURVEY OF NOISE POLLUTION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 71 96P SHIH,H. H. ;
REPT. NO. 71-5
CONTRACT: N000I4-69-A-0432

UNCLASSIFIED REPORT

DESCRIPTORS: (*NOISE, *REVIEWS), PUBLIC HEALTH, ENVIRONMENT, STRESS(PSYCHOLOGY), STRESS(PHYSIOLOGY), CONTROL, HEARING, INDUSTRIAL MEDICINE, SONIC BOOM, BIBLIOGRAPHIES (U)
IDENTIFIERS: *NOISE POLLUTION (U)

PHYSICALLY, NOISE IS A COMPLEX SOUND THAT HAS LITTLE OR NO PERIODICITY. HOWEVER, THE ESSENTIAL CHARACTERISTIC OF NOISE IS ITS UNDESIRABILITY. THUS, NOISE CAN BE DEFINED AS ANY ANNOYING OR UNWANTED SOUND. IN RECENT YEARS, THE RAPID INCREASE OF NOISE LEVEL IN OUR ENVIRONMENT HAS BECOME A NATIONAL PUBLIC HEALTH HAZARD. NOISE AFFECTS MAN'S STATE OF MENTAL, PHYSICAL, AND SOCIAL WELL-BEING. THE PROBLEM FORMS A SPECIAL TYPE OF AIR POLLUTION. NOISE STUDY IS A RATHER NEW SUBJECT AMONG OTHER BRANCHES OF SCIENCE. THE TRANSITION FROM ART TO NEAR-SCIENCE STARTED FROM BEFORE THE WORLD WAR II. THE WORK IS AN ATTEMPT TO ARRIVE AT AN UNDERSTANDING OF THE GENERAL SITUATION ON THE PROBLEM OF NOISE. THE SURVEY CONSISTS OF FOUR MAJOR PARTS: THE PRESENT STATUS OF NOISE POLLUTION, ITS SOURCES, ITS EFFECTS, AND THE CONTROL. MANY URGENT RESEARCH NEEDS ARE ALSO IDENTIFIED. FINALLY, LISTS OF TERMINOLOGY AND BIBLIOGRAPHY RELATING TO NOISE POLLUTION PROBLEMS ARE PROVIDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 724 942 4/1 20/1
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY PALISADES N Y

SOUND FROM APOLLO ROCKETS IN SPACE, (U)

OCT 70 7P COTTEN,DONALD ;DONN,WILLIAM L. ;

REPT. NO. LDGO-1618
CONTRACT: DAAB07-69-C-0250, DAHC04-67-C-0037
PROJ: DA-2-0-061102-B-53-B
MONITOR: AROD 6997:18-EN

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN SCIENCE, V171 P565-567, 12 FEB 71.

DESCRIPTORS: (*MICROBAROMETRIC WAVES, MEASUREMENT), (*MANNED SPACECRAFT, SONIC BOOM), SOUND TRANSMISSION, TURBULENCE, UPPER ATMOSPHERE, SUPERSONIC FLOW, KINETIC THEORY, LOW FREQUENCY, BERMUDA (U)
IDENTIFIERS: APOLLO 12 SPACECRAFT, APOLLO, APOLLO 13 SPACECRAFT, INFRASONICS, RADIATION (U)

LOW-FREQUENCY SOUND HAS BEEN RECORDED ON AT LEAST TWO OCCASIONS IN BERMUDA WITH THE PASSAGE OF APOLLO ROCKET VEHICLES 188 KILOMETERS ALOFT. THE SIGNALS, WHICH ARE REMINISCENT OF N-WAVES FROM SONIC BOOMS, ARE: HORIZONTALLY COHERENT; HAVE EXTREMELY HIGH (SUPERSONIC) TRACE VELOCITIES ACROSS THE TRIPARTITE ARRAYS; HAVE NEARLY IDENTICAL APPEARANCE AND FREQUENCIES; HAVE ESSENTIALLY IDENTICAL ARRIVAL TIMES AFTER ROCKET LAUNCH; ARE THE ONLY COHERENT SIGNALS RECORDED OVER MANY HOURS. THESE OBSERVATIONS SEEM TO ESTABLISH THAT THE RECORDED SOUND COMES FROM THE ROCKETS AT HIGH ELEVATION. DESPITE THIS HIGH ELEVATION, THE VALUES OF SURFACE PRESSURE APPEAR TO BE EXPLAINABLE ON THE BASIS OF A COMBINATION OF A KINETIC THEORY APPROACH TO SHOCK FORMATION IN RAREFIED ATMOSPHERE WITH ESTABLISHED GAS-DYNAMICS SHOCK THEORY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 132 20/1
NAVAL ORDNANCE LAB WHITE OAK MD

SONIC BOOMS IN THE SEA. (U)

FEB 71 21P URICK,R. J. ;
REPT. NO. NOLTR-71-30
PROJ: NOL-1R-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*UNDERWATER SOUND, MEASUREMENT), (*SONIC BOOM, UNDERWATER SOUND), JET FIGHTERS, SOUND TRANSMISSION, DEEP WATER, SURFACE TO UNDERWATER, NAVAL AIRCRAFT (U)
IDENTIFIERS: AIR WATER INTERACTIONS, MOST PROJECT-2 (U)

SONIC BOOMS LAID DOWN BY NAVY FIGHTER AIRCRAFT FLYING AT MACH 1.1-1.2 HAVE BEEN OBSERVED BELOW THE SURFACE OF THE SEA BY MEANS OF A STRING OF HYDROPHONES 195 FEET LONG DANGLING FROM A SURFACE SHIP. THE UNDERWATER BOOMS WERE FOUND TO DECAY ABOUT AS THE -3/2 POWER OF THE DEPTH BELOW THE SURFACE, TO HAVE THE SAME SPECTRAL CONTENT AS THE BOOM IN AIR, AND TO TRAVEL DOWN THE STRING WITH THE VELOCITY OF SOUND IN WATER. THESE FINDINGS CONTRADICT THE THEORY OF AN 'INHOMOGENEOUS' WAVE INCIDENT BEYOND THE CRITICAL ANGLE, AS ORIGINALLY STATED BY RAYLEIGH AND AS RECENTLY EXTENDED TO SONIC BOOMS BY SAWYERS AND COOK. THEY SUGGEST, INSTEAD, THAT THE UNDERWATER SONIC BOOM IS A WAVE SCATTERED BY THE ROUGH SEA SURFACE INTO THE SEA BELOW. ITS DECAY WITH DEPTH IS SO RAPID THAT IT IS NOT LIKELY TO BE PERCEPTIBLE AGAINST THE AMBIENT NOISE BACKGROUND AT DEPTHS GREATER THAN ONE OR TWO THOUSAND FEET IN THE DEEP SEA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 185 20/1
ROCHESTER UNIV N Y DEPT OF ELECTRICAL ENGINEERING

MEASUREMENTS OF THE REFRACTION AND DIFFRACTION OF A SHORT N WAVE BY A GAS-FILLED SOAP BUBBLE. (U)

SEP 70 9P DAVY,BRUCE A. ;BLACKSTOCK, DAVID T. ;

CONTRACT: F44620-69-C-0044
PROJ: AF-9781
TASK: 978102
MONITOR: AFOSR TR-71-1670

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL SOCIETY OF AMERICA, V49 N3 PT2 P732-737 MAR 71.

DESCRIPTORS: (*SONIC BOOM, SPECTRUM SIGNATURES), (*SOUND TRANSMISSION, BUBBLES), EXPERIMENTAL DESIGN, TEST EQUIPMENT, TEST METHODS, REFRACTION, DIFFRACTION, FOCUSING (U)
IDENTIFIERS: WAVEFORMS (U)

THE PRESSURE SIGNATURES OF SONIC BOOMS MEASURED IN THE FIELD OFTEN SHOW CONSIDERABLE VARIATIONS FROM THE IDEAL N WAVESHAPE. PEAKED AND ROUNDED VERSIONS OF THE N ARE COMMONLY OBSERVED. PIERCE HAS PROPOSED THAT PEAKING AND ROUNDING ARE THE RESULT OF REFRACTION AND DIFFRACTION CAUSED BY ATMOSPHERIC INHOMOGENEITIES. TO TEST THIS EXPLANATION, A MODEL EXPERIMENT HAS BEEN CARRIED OUT IN THE LABORATORY. N WAVES ABOUT 1 CM LONG WERE PRODUCED BY AN ELECTRIC SPARK, REFRACTED AND DIFFRACTED BY A GAS-FILLED SOAP BUBBLE, AND RECEIVED BY A VERY WIDE-RANGE CONDENSER MICROPHONE. THE MICROPHONE OUTPUT WAS DISPLAYED ON AN OSCILLOSCOPE. THE SPARK-MICROPHONE DISTANCE WAS HELD FIXED, AND MEASUREMENTS WERE TAKEN WITH THE BUBBLE AT VARIOUS POINTS IN BETWEEN. THE BUBBLE ACTED AS A CONVERGING ACOUSTIC LENS WHEN IT WAS FILLED WITH ARGON AND AS A DIVERGING LENS WHEN FILLED WITH HELIUM. IT WAS FOUND THAT THE CONVERGING LENS CAUSED PEAKING OF THE N WAVE, WHILE THE DIVERGING LENS CAUSED ROUNDING. THESE RESULTS QUALITATIVELY SUPPORT PIERCE'S THEORETICAL MODEL. THE DATA DO NOT SERVE AS A QUANTITATIVE TEST OF PIERCE'S SPECIFIC NUMERICAL EXAMPLES, HOWEVER, BECAUSE THE PARTICULAR CONDITIONS HE ASSUMED WERE NOT REPRODUCED IN OUR EXPERIMENT. A DISCUSSION IS GIVEN OF THE EFFECT OF SOME OF THESE CONDITIONS, SUCH AS THE ORDER AND RELATIVE TIME OF ARRIVAL OF THE REFRACTED AND DIFFRACTED WAVES, ON THE WAVEFORM. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 658 20/1
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V AACHEN (WEST GERMANY)

UEBERSCHALLKNALL UND WIDERSTAND EINES VORNE SPITZEN ROTATIONSKOERPERS IN EINER SCHEREGESCHICHTETEN ATMOSPHAERE (SONIC BOOM AND RESISTANCE OF A FORWARD BOW BOOM BODY IN A STRATIFIED ATMOSPHERE), (U)

JUL 70 9P STUFF,ROLAND I
REPT. NO. DFVLR-SONDERDRUCK-97

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER ANGEWANDTE MATHEMATIK UND PHYSIK, V21 N6 P940-946 1970. NO COPIES FURNISHED BY DDC OR NTIS.
SUPPLEMENTARY NOTE: TEXT IN GERMAN, ATTACHED SUMMARY IN ENGLISH.

DESCRIPTORS: (*SONIC BOOM, AERODYNAMIC CONFIGURATIONS), DRAG, SHOCK WAVES, THICKNESS, WEST GERMANY (U)

J. L. RYHMING CONCLUDED THAT THE MINIMUM-BOOM BODY FOR GIVEN BOW-SHOCK WAVE DRAG AND MAXIMUM BODY THICKNESS IS ALSO THE MINIMUM DRAG BODY DUE TO THE BOW SHOCK FOR A GIVEN MAXIMUM BODY THICKNESS. IT IS SHOWN THAT THE ABOVE CONCLUSION IS ONLY VALID FOR ASYMPTOTIC DISTANCES. THE GEOMETRY OF THE MINIMUM-BOOM BODY DEPENDS ON THE DISTANCE FOR WHICH ONE WANTS TO MINIMIZE THE SONIC BOOM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 865 20/1
KALAMAZOO COLL MICH DEPT OF PHYSICS

STUDIES OF N WAVES FROM WEAK SPARKS IN AIR. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 63P WRIGHT,WAYNE M. ;
CONTRACT: NONR-3932(00)
PROJ: NR-384-321

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRIC DISCHARGES, ACOUSTIC PROPERTIES), SOUND TRANSMISSION, GAS DISCHARGES, SHOCK WAVES, SONIC BOOM, TRANSIENTS (U)

THE REPORT SUMMARIZES WORK PERFORMED AT KALAMAZOO COLLEGE DURING THE PERIOD 1962-1970 ON THE STUDY OF ACOUSTIC TRANSIENTS IN AIR. THE MAJOR PORTION OF THIS RESEARCH WAS A MANY FACETED STUDY OF THE ACOUSTIC TRANSIENTS PRODUCED IN AIR BY WEAK SPARKS. THE SPARK ENERGIES WERE IN THE RANGE 0.0016 - 0.56 J, AND THE ACOUSTIC WAVEFORMS RESEMBLED N WAVES WITH DURATIONS OF 10 - 40 MICROSECONDS AND AMPLITUDES OF THE ORDER OF 0.01 ATMOSPHERE. THESE WAVEFORMS WERE OBSERVED BY MEANS OF WIDE-BAND CONDENSER MICROPHONES. IT WAS POSSIBLE TO REPRODUCE A WEAK SHOCK WITH A RISE TIME AS SHORT AS 1/2 MICROSECONDS. TOPICS INVESTIGATED INCLUDE THE DEPENDENCE OF ACOUSTIC WAVEFORM UPON PROPAGATION DIRECTION, SPARK LENGTH, AND DISCHARGE ENERGY; THE DISTORTION OF THE WAVE PROFILE WITH PROPAGATION DISTANCE; AND THE DIFFRACTION AND SCATTERING OF N WAVES FROM RECTANGULAR PLATES, CIRCULAR DISCS, AND CYLINDRICAL RODS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 728 332 5/10 20/1
STANFORD RESEARCH INST MENLO PARK CALIF

A STUDY OF SENSITIVITY TO NOISE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 65P BECKER,R. W. ;POZA,F. ;
KRYTER,K. D. ;
CONTRACT: DOT-FA69WA-2211
MONITOR: FAA-EQ 71-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*NOISE, SENSITIVITY), (*PSYCHOPHYSIOLOGY, *SONIC BOOM), AUDITORY PERCEPTION, PSYCHOACOUSTICS, REACTION(PSYCHOLOGY), PERSONALITY, ATTITUDES, SIMULATION, ANALYSIS OF VARIANCE (U)
IDENTIFIERS: NOISE POLLUTION (U)

IN THE STUDY, 140 SUBJECTS WERE EXPOSED TO SIMULATED SONIC BOOMS AND RECORDED RESIDENTIAL NOISES IN ONE, TWO, OR THREE TWO-HOUR SESSIONS OVER A PERIOD OF SIX MONTHS. ELECTROPHYSIOLOGICAL MEASURES OF HEART RATE AND ELECTROMYOGRAPHIC RESPONSES TO THE STIMULI WERE ANALYZED. BIOGRAPHICAL, DEMOGRAPHICAL, AND PERSONALITY INVENTORIES WERE ALSO OBTAINED FOR EACH OF THE SUBJECTS. THE PURPOSE OF THIS RESEARCH WAS TO: DETERMINE WHETHER THERE ARE DIFFERENT DEGREES OF PSYCHOLOGICAL AND PHYSIOLOGICAL SENSITIVITY TO NOISE IN A LARGE GROUP OF PEOPLE; TO DETERMINE WHETHER AND HOW SUCH SENSITIVITY VARIED IN TIME; AND TO RELATE SUCH SENSITIVITY TO OTHER PSYCHOLOGICAL AND PERSONALITY VARIABLES. SIGNIFICANT DIFFERENCES IN PSYCHOLOGICAL SENSITIVITY TO NOISE WERE FOUND IN THE SUBJECT POPULATION. THESE DIFFERENCES REMAINED STABLE FOR THE DURATION OF THE EXPERIMENT AND WERE ALSO FOUND TO BE RELATED TO THE ATTITUDINAL AND BELIEF STRUCTURES OF THE INDIVIDUALS. DEFINITE PHYSIOLOGICAL RESPONSES TO THE SIMULATED SONIC BOOMS WERE OBSERVED. HOWEVER, THE PHYSIOLOGICAL INDICES USED IN THIS RESEARCH DID NOT SHOW INDIVIDUAL DIFFERENCES IN PHYSIOLOGICAL SENSITIVITY TO NOISE. THESE RESULTS DO NOT PRECLUDE THE POSSIBILITY THAT MORE ELABORATE AND EXTENSIVE PSYCHOPHYSIOLOGICAL MEASUREMENT MIGHT DEMONSTRATE VARYING PHYSIOLOGICAL SENSITIVITY TO NOISE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMD9

AD- 729 833 5/10 20/1
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

THE EFFECTS OF SIMULATED SONIC BOOMS ON TRACKING PERFORMANCE AND AUTONOMIC RESPONSE, (U)

JUN 71 18P THACKRAY,RICHARD I. ;
TOUCHSTONE,R. MARK ;JONES,KAREN N. ;
PROJ: FAA-AM-A-71-PSY-21
MONITOR: FAA-AM 71-29

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *REACTION(PSYCHOLOGY)), PERFORMANCE TESTS, RESPONSES, TRACKING, HEART, SKIN, PSYCHOPHYSIOLOGY, SIMULATION (U)
IDENTIFIERS: OVERPRESSURE, HEART RATE (U)

SUBJECTS WERE EXPOSED TO FOUR SIMULATED 'INDOOR' SONIC BOOMS OVER AN APPROXIMATE THIRTY-MINUTE PERIOD. THE OVERPRESSURE LEVELS WERE 1.0, 2.0 AND 4.0 PSF (AS MEASURED 'OUTDOORS') WITH DURATIONS OF 295 MILLISECONDS. SUBJECTS PERFORMED A TWO-DIMENSIONAL COMPENSATORY TRACKING TASK DURING THE EXPOSURE PERIOD AND CONTINUOUS RECORDINGS WERE OBTAINED OF HEART RATE AND SKIN CONDUCTANCE. NO EVIDENCE OF PERFORMANCE IMPAIRMENT WAS FOUND FOR ANY OF THE OVERPRESSURE LEVELS. RATHER, PERFORMANCE IMPROVED SIGNIFICANTLY FOLLOWING BOOM STIMULATION ALONG WITH HEART-RATE DECELERATION AND SKIN CONDUCTANCE INCREASE. THE OBTAINED PATTERN SUGGESTS THAT THE SIMULATED BOOMS MAY HAVE ELICITED MORE OF AN ORIENTING OR ALERTING RESPONSE THAN A STARTLE REFLEX. THE RESULTS ARE DISCUSSED IN TERMS OF THE POSSIBLE IMPORTANCE OF RISE TIME AS A DETERMINANT OF THE PHYSIOLOGICAL AND PERFORMANCE EFFECTS WHICH MAY BE PRODUCED BY SONIC BOOMS. SINCE FASTER RISE TIMES OF THE SIMULATED BOOMS MIGHT HAVE INCREASED LOUDNESS SUFFICIENTLY TO CHANGE THESE RESULTS CONSIDERABLY, CARE SHOULD BE TAKEN TO AVOID DRAWING UNWARRANTED CONCLUSIONS, RELATIVE TO GENERAL SONIC BOOM EFFECTS, ON THE BASIS OF THESE FINDINGS ALONE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 732 679 13/2 6/6
RAND CORP SANTA MONICA CALIF

FIFTY MORE TIMELY PROBLEMS OF THE ENVIRONMENT, (U)

MAR 71 65P LIBBY,L. M. ;
REPT. NO. P-4589

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. P-4415 DATED SEP 70.

DESCRIPTORS: (*ENVIRONMENT, PROBLEM SOLVING), (*AIR POLLUTION, REVIEWS), (*WATER POLLUTION, REVIEWS), CORRECTIONS, ECOLOGY, MINING ENGINEERING, ARSENIC, ANTARCTIC REGIONS, SONIC BOOM, AIRPORTS, FOG, ENZYMES, SEA ICE, MERCURY, FOOD, USSR, PUBLIC HEALTH, PETROLEUM INDUSTRY, VERMONT, ARCTIC REGIONS, INDIANA, HARBORS, NEW YORK, SANITARY ENGINEERING, REFINERIES, GEORGIA (U)
IDENTIFIERS: WATER RECLAMATION, WEATHER MODIFICATION, NOISE POLLUTION, HOUSTON SHIP CHANNEL, SURFACE WATER RUNOFF, DETERGENTS (U)

THE ARTICLE INCLUDES VERY BRIEF REPORTS ON VARIOUS ENVIRONMENTAL TOPICS SOME OF THE TOPICS INCLUDE: EARTHQUAKE-RESISTANT BUILDING CONSTRUCTION, NOISE POLLUTION; ECOLOGICAL CHANGES CAUSED BY THE ASWAN DAM; MONITORING STARTUP OF NEW MINES AND SHUTDOWN OF OLD FURNACES; ARSENIC IN DETERGENTS AND IN RUN-OFF WATERS; DAMAGED FOOD VALUE OF VEGETABLE CROPS; ENZYMES IN DETERGENTS; ENVIRONMENTAL SAFETY IN HOUSTON SHIP CHANNEL; LIMITS OF HUMAN TOLERANCE FOR MERCURY CONTENT OF FOODS; SCALED COSTING OF WATER AS INCENTIVE FOR INDUSTRIAL REUSE; THERMAL POLLUTION OF LAKES AND RIVERS; SURVEY OF POLLUTION CONTROL BY INDUSTRY; OIL DISCOVERIES IN THE ARCTIC--OWNERSHIP; NEW CITY ON STATEN ISLAND; PNEUMATIC COLLECTION OF TRASH CITYWIDE; DEEP WELL WASTE DISPOSAL FOR WATER; STOL AIRPORTS FOR LARGE CITIES; SINKING LAND COMBATTED BY SOLID WASTE DISPOSAL; WATER POLLUTION BY FEED LOTS; RADIATION TREATMENT FOR SEWAGE; TAX INCENTIVES FOR COAL BURNERS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 734 436 20/1 1/3
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

SONIC BOOM MINIMIZATION THROUGH AIR STREAM ALTERATION. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 70-JUL 71,
JUL 71 138P LIPFERT,F. W. ;
REPT. NO. GASL-TR-760
CONTRACT: FA-70-WA-2320
MONITOR: FAA-RD 71-90

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, REDUCTION), (*SUPERSONIC PLANES, SONIC BOOM), SUPERSONIC CHARACTERISTICS, PRESSURE, COMBUSTION, BOUNDARY LAYER, INTERFERENCE, LIFT, JETS, LASERS (U)
IDENTIFIERS: SCAT 15F AIRCRAFT, SUPERSONIC TRANSPORT PLANES (U)

THE POTENTIAL OF MODIFYING SUPERSONIC AIRCRAFT SONIC BOOM SIGNATURES BY MEANS OF ALTERING THE FLOW FIELD IN THE VICINITY OF THE AIRCRAFT WAS INVESTIGATED THEORETICALLY. A SPECIFIC AIRPLANE, THE NASA SCAT-15F, WAS SELECTED AS A BASIS, AND A CRUISE FLIGHT CONDITION OF MACH 2.7, 62,000 FEET WAS CHOSEN. SIGNATURES WERE COMPUTED USING REAL (1962) ATMOSPHERIC PROPERTIES. FINITE RISE TIMES, REDUCED OVERPRESSURES, AND REDUCED SHOCK PRESSURE RISES WERE AMONG THE SIGNATURE IMPROVEMENTS INVESTIGATED. FLOW FIELD ALTERATION MECHANISMS CONSIDERED INCLUDED FREE COMBUSTION, BOUNDARY LAYER MASS ADDITION, FORCE FIELDS, AND LASER-GENERATED HEAT FIELDS. FINALLY, THE CONCEPT OF A SEPARATE 'PENALTY AIRCRAFT' WAS PUT FORTH. THIS WOULD BE AN AIRCRAFT, PRESUMABLY CARRYING NO PAYLOAD, THAT WOULD FLY FLY IN CLOSE PROXIMITY (SO THAT THE SONIC BOOMS INTERFERE) TO THE BASELINE AIRCRAFT AND RELIEVE THE NECESSITY OF INCREASING THE BASELINE AIRCRAFT GROSS WEIGHT BECAUSE OF SONIC BOOM ALLEVIATION SCHEMES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 735 296 1/2 20/1
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF SONIC BOOM DURING OPERATIONAL MANEUVERS. VOLUME I. ANALYSIS AND COMPUTATION OF MANEUVER EFFECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 70-FEB 71.
FEB 71 311P
REPT. NO. D6-A12108-1
CONTRACT: DOT-FA70WA-2315
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, MANEUVERABILITY), (*SUPERSONIC PLANES, SONIC BOOM), PRESSURE, NUMERICAL ANALYSIS, STATISTICAL DATA (U)
IDENTIFIERS: SCAT 15F AIRCRAFT, *SUPERSONIC TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE CONTAINED IN THREE VOLUMES. VOLUME I SHOWS THAT THE THEORETICAL EFFECTS OF OPERATIONAL MANEUVERS DUE TO TYPICAL SST MANEUVERS ARE SMALL EXCEPT FOR MANEUVERS AT MACH NUMBERS BELOW ABOUT MACH 1.3. METHODS ARE OUTLINED FOR APPLYING THE RESULTS TO ANY AIRPLANE, AND SELECTED PRESSURE SIGNATURES ARE PRESENTED FOR THE U.S. SST AND SCAT 15-F.
(AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 735 297 1/2 20/1
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF SONIC BOOM DURING OPERATIONAL MANEUVERS. VOLUME III. DESCRIPTION OF COMPUTER PROGRAM 'SONIC BOOM PROPAGATION IN A STRATIFIED ATMOSPHERE' AND ESTIMATION OF LIMITATION NEAR CAUSTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 70-FEB 71,
FEB 71 294P HAGLUND,G. T. ;OLSON,D. L. ;
REPT. NO. D6A-12108-3
CONTRACT: DOT-FA70WA-2315
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-735 390.

DESCRIPTORS: (*SUPERSONIC PLANES, SONIC BOOM), COMPUTER PROGRAMS, PRESSURE, METEOROLOGICAL PARAMETERS (U)
IDENTIFIERS: SCAT 15F AIRCRAFT, FORTRAN, FORTRAN 4 PROGRAMMING LANGUAGE, *SUPERSONIC TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE CONTAINED IN THREE VOLUMES. VOLUME III DESCRIBES THE COMPUTER PROGRAM, 'SONIC BOOM PROPAGATION IN A STRATIFIED ATMOSPHERE', WRITTEN IN FORTRAN IV FOR PROCESSING ON AN IBM 7090 OR CDC 6600 AND PLOTTING ON A CALCOMP DIGITAL INCREMENTAL PLOTTER. IT PROVIDES THE CAPABILITY TO CALCULATE SONIC BOOM PRESSURE SIGNATURES GENERATED BY ARBITRARY MANEUVERING AIRPLANES IN HORIZONTALLY STRATIFIED ATMOSPHERES WITH WIND. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 735 390 1/2 20/1
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF SONIC BOOM DURING OPERATIONAL MANEUVERS. VOLUME II. PRELIMINARY FLIGHT TEST PLAN. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR-DEC 70, DEC 70 101P HAGLUND,GEORGE T. ;KANE, EDWARD J. ;
REPT. NO. D6A-12108-2
CONTRACT: DOT-FA70WA-2315
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-735 296, AND VOLUME 3, AD-735 297.

DESCRIPTORS: (*SUPERSONIC PLANES, *SONIC BOOM), FLIGHT TESTING, ACCELERATION, LEVEL FLIGHT, MATHEMATICAL ANALYSIS (U)
IDENTIFIERS: SCAT 15F AIRCRAFT, *SUPERSONIC TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE CONTAINED IN THREE VOLUMES. VOLUME II CONTAINS A FLIGHT TEST PLAN DESIGNED TO INVESTIGATE CAUSTICS AT THE GROUND PRODUCED DURING LONGITUDINAL ACCELERATIONS, CIRCULAR TURNS, AND STEADY, LEVEL FLIGHT AT THE THRESHOLD MACH NUMBER. A FLIGHT TEST PLAN IS DEFINED FOR STUDYING SONIC BOOM PHENOMENA NEAR LATERAL CUT-OFF. CHARTS ARE PROVIDED TO BE USED IN THE FIELD IN DETERMINING THE REQUIRED AIRPLANE POSITION RELATIVE TO THE MEASURING NETWORKS AS A FUNCTION OF FLIGHT VARIABLES AND METEOROLOGICAL CONDITIONS. METHODS ARE GIVEN FOR CALCULATING CAUSTIC LOCATIONS DUE TO LONGITUDINAL ACCELERATIONS AND THE LATERAL CUT-OFF LOCATION DURING STEADY, LEVEL FLIGHT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 738 790 21/5
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V BRUNSWICK (WEST GERMANY)

ZUR AUSLEGUNG UND BEMESSUNG EINES TRIEBWERKS MIT WAHLWEISE ZUSCHALTBAREN TRIEBWERKSKOMPONETEN FUER DEN EINSATZ IN UEBERSCHALL-VERKENHRSFLUGZEUGEN (DESIGN AND PARAMETERS OF A POWER PLANT WITH OPTIONALLY SELECTIVE POWER COMPONENTS FOR SUPERSONIC AIRLINERS), (U)

AUG 70 12P VON BONIN,LUTZ ;
REPT. NO. DFVLR-SONDERDRUCK-169

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER FLUGWISSENSCHAFTEN V19 N11 P437-448 1971. NO COPIES FURNISHED BY DDC OR NTIS.
SUPPLEMENTARY NOTE: TEXT IN GERMAN. SUMMARY IN ENGLISH AND FRENCH.

DESCRIPTORS: (*AIRCRAFT ENGINES, EXPERIMENTAL DESIGN), SUPERSONIC AIRCRAFT, SUBSONIC CHARACTERISTICS, HIGH ALTITUDE, SUPERSONIC CHARACTERISTICS, MATHEMATICAL MODELS, PAYLOAD, FEASIBILITY STUDIES (U)

THE SUBJECT OF THE STUDY IS THE PROPOSAL FOR A TWIN SPOOL POWER PLANT WITH HIGH PRESSURE CUT OFF FOR OPERATION IN SUPERSONIC AIRLINERS (MACH NUMBER 3) WHICH HAVE TO PASS A LARGER FLIGHT SECTION IN THE SUBSONIC RANGE REACHING BEYOND THE CLIMB AND ACCELERATION PHASE WITH REGARD TO THE SUPERSONIC BOOM. THIS PROPOSAL IS BASED ON CONSTRUCTING AN ENGINE FOR THE TWO EXTREMELY DIFFERING FLIGHT CONDITIONS - SUPERSONIC FLIGHT WITH MACH NUMBER 3 IN AN ALTITUDE OF 20 KM AND SUBSONIC FLIGHT WITH MACH NUMBER 0.9 IN AN ALTITUDE OF 11 KM - THAT IS OPTIMALLY DESIGNED AND SIZED FOR BOTH FLIGHT PHASES. AFTER A BRIEF DISCUSSION OF THE STRUCTURE AND METHOD OF OPERATION OF SUCH AN ENGINE, THE SYSTEM OF EQUATIONS FOR THE DETERMINATION OF THE PAYLOAD RELATED TO THE STARTING WEIGHT IS DEVELOPED WITH SOME SIMPLIFYING ASSUMPTIONS IN ORDER TO BE ABLE TO INVESTIGATE THE EFFECT OF SUCH AN ENGINE CONCEPT ON THE PROFITABILITY OF THE AIRCRAFT WITHIN A FIRST ONSET. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 740 697 S/10 20/1
TRACOR INC AUSTIN TEX

ENVIRONMENTAL INFLUENCE ON PUBLIC RESPONSE TO THE SONIC BOOM. (U)

DESCRIPTIVE NOTE: FINAL REPT.
72 47P
CONTRACT: DOT-FA70WA-2254
PROJ: FAA-253-011
MONITOR: FAA-NO 70-17

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *ATTITUDES(PSYCHOLOGY)), (*PUBLIC OPINION, *SONIC BOOM), JET PLANE NOISE, AIRPORTS, URBAN AREAS, NOISE, VEHICLES, TRANSPORTATIO(U)
IDENTIFIERS: *NOISE EXPOSURE, *NOISE POLLUTION, COMMUNITIES (U)

PREVIOUS STUDIES OF PUBLIC RESPONSE TO THE SONIC BOOM HAVE NOT CONSIDERED REACTIONS TO THE BOOM WITHIN THE CONTEXT OF THE CITY OR NEIGHBORHOOD ENVIRONMENT. DATA CONCERNING COMMUNITY REACTION TO AIRPORT NOISE IN ORDER TO STUDY THE EFFECT OF ENVIRONMENT CONDITIONS, BOTH PHYSICAL AND SOCIAL, ON RESPONSE TO THE BOOM. ATTITUDINAL RESPONSE IS AFFECTED BY THE RESPONDENT'S ENVIRONMENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 740 897 20/1
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

THE EFFECTS OF WIND AND TEMPERATURE GRADIENTS ON SONIC BOOM CORRIDORS. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
OCT 71 39P ONYEONWU,R. O. I
REPT. NO. UTIAS-TN-168
CONTRACT: AF-AFOSR-1885-70
PROJ: AF-9781
TASK: 978102
MONITOR: AFOSR TR-71-3087

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, EQUATIONS OF MOTION), DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS, CURVE FITTING, FLIGHT PATHS, MATHEMATICAL MODELS, SUPERSONIC FLIGHT, ATMOSPHERIC TEMPERATURE, WIND, CANADA (U)

CALCULATION OF SONIC BOOM CORRIDOR WIDTHS BASED ON CLOSED FORM SOLUTIONS OF RAY ACOUSTIC EQUATIONS USING PIECEWISE LINEAR ATMOSPHERIC MODELS OF WINDS AND TEMPERATURES HAS BEEN ACCOMPLISHED. DETAILED SOLUTIONS OF RAY TRACING EQUATIONS ARE PRESENTED FOR ALL POSSIBLE VARIATIONS OF WINDS AND TEMPERATURES, WITHIN THE FRAMEWORK OF THE ASSUMED MODEL ATMOSPHERE. THE EFFECTS OF AIRCRAFT FLIGHT ALTITUDE AND MACH NUMBER, WIND AND TEMPERATURE GRADIENTS, AND WIND DIRECTION ON SONIC BOOM CORRIDOR ARE INVESTIGATED IN DETAIL, INCLUDING THE EFFECTS OF NON-STANDARD ATMOSPHERES SUCH AS PREVAIL IN WINTER MONTHS. NUMERICAL RESULTS ARE PRESENTED AND AMPLY DISCUSSED. AGREEMENT OF THE PRESENT CALCULATIONS WITH PUBLISHED DATA IS EXCELLENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 741 852 13/13
WIGGINS (J H) CO PALOS VERDES ESTATES CALIF

SONIC BOOM AND NATURAL DETERIORATION EFFECTS ON BUILDINGS - WHITE SANDS STRUCTURE RESURVEY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 72 51P WIGGINS,J. H. , JR;
MONITOR: FAA-RD 72-25

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *BUILDINGS), DEGRADATION, CRACKS, DAMAGE ASSESSMENT, NEW MEXICO (U)
IDENTIFIERS: WEATHERING (U)

THE PURPOSE OF THE STUDY WAS TO EVALUATE THE CURRENT STATE OF NATURAL DETERIORATION OF THE STRUCTURES USED FOR SONIC BOOM TESTING PURPOSES BY THE FAA AND TO COMPARE THAT STATE WITH THE DAMAGES CAUSED BY THE 1494 SONIC BOOMS GENERATED DURING THE TESTS. STRUCTURAL RESPONSE TESTS WERE CONDUCTED UNDER SONIC BOOMS RANGING IN INTENSITY FROM 1.5 PSF. TO 38 PSF. SINCE THE TESTING PROGRAM, SEVEN YEARS OF NATURAL FORCES RESULTING FROM SUN, WIND, MOISTURE AND SOIL MOVEMENTS HAVE TAKEN PLACE. IT WAS OF GREAT INTEREST, THEREFORE, TO REEAXAMINE THESE STRUCTURES SOME SEVEN YEARS LATER AND DETERMINE THE AMOUNT OF NATURALLY OCCURRING CUMULATIVE DAMAGE THAT HAS TAKEN PLACE OVER THE YEARS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO9

AD- 745 728 20/1 4/1
NAVAL ORDNANCE LAB WHITE OAK MD

PROPAGATION OF A WEAK SHOCK WAVE THROUGH A TURBULENT MEDIUM, (U)

MAY 72 26P PHINNEY,RALPH E. ;TAYLOR, LEONARD S. ;
REPT. NO. NOLTR-72-130
PROJ: NOL-324/FAA

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, DISTORTION), (*ATMOSPHERIC MOTION, MICROBAROMETRIC WAVES), PROPAGATION, PARTIAL DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS, TURBULENCE, SHOCK WAVES (U)

THE PROPAGATION OF A WEAK NEARLY PLANE SHOCK WAVE THROUGH A SLIGHTLY INHOMOGENEOUS MEDIUM WAS STUDIED. THE EQUATIONS FOR A FINITE STRENGTH SHOCK WAVE ARE USED AS A STARTING POINT IN ORDER THAT THE CUMULATIVE EFFECT OF SECOND ORDER TERMS WILL NOT BE LOST. THE MOTIVATION FOR THE STUDY WAS THE EXPERIMENTAL OBSERVATION THAT ATMOSPHERIC TURBULENCE CAN ALTERNATELY FOCUS AND DEFOCUS WEAK WAVES FROM AN AIRCRAFT. A MORE DETAILED UNDERSTANDING OF THE INFLUENCE OF ATMOSPHERIC TURBULENCE ON THIS PROBLEM WAS SOUGHT. THE BASIC EQUATIONS ARE DERIVED, AND SOME PRELIMINARY RESULTS ARE OBTAINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 747 989 5/10
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

RESIDUAL PERFORMANCE EFFECTS OF SIMULATED SONIC BOOMS INTRODUCED DURING SLEEP. (U)

MAY 72 12P CHILES,W. DEAN ;WEST, GEORGETTA ;
MONITOR: FAA-AM 72-19

UNCLASSIFIED REPORT

DESCRIPTORS: (*SLEEP, *SONIC BOOM), (*STRESS(PSYCHOLOGY), SONIC BOOM), PERFORMANCE(HUMAN), MALES, SIMULATION, AGING(PHYSIOLOGY), DIURNAL VARIATIONS, PSYCHOACOUSTICS (U)

TWENTY-FOUR MALE SUBJECTS WERE TESTED ON A COMPLEX PERFORMANCE DEVICE INVOLVING MONITORING, MENTAL ARITHMETIC, AND PATTERN DISCRIMINATION. THREE AGE-GROUPS WERE USED: 20 TO 26, 40 TO 45, AND 60 TO 72. SUBJECTS WERE TESTED FOR 30 MINUTES EACH MORNING AND EACH EVENING FOR A 21-DAY PERIOD. ON THE SIXTH THROUGH THE 17TH NIGHTS, SUBJECTS WERE EXPOSED TO EIGHT SIMULATED SONIC BOOMS WITH AN 'OUTDOORS' OVERPRESSURE LEVEL OF 1.0 PSF PRESENTED AT 1-HOUR INTERVALS DURING SLEEP. THE RESULTS PROVIDED NO EVIDENCE THAT EXPOSURE TO SIMULATED SONIC BOOMS DURING SLEEP PRODUCED MEASURABLE CONSEQUENCES WITH RESPECT TO COMPLEX PERFORMANCE. A SIGNIFICANT AGE EFFECT WAS FOUND FOR FIVE OF THE TEN MEASURES. SIGNIFICANT DIFFERENCES (APPARENTLY A LEARNING EFFECT) WERE FOUND IN PERFORMANCE ACROSS THE THREE PHASES (PRE-BOOM, BOOM, AND POST-BOOM). THERE WAS ALSO A SIGNIFICANT INTERACTION BETWEEN AGE AND PHASE FOR FIVE OF THE MEASURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD= 748 055 5/10 20/1
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO

HUMAN RESPONSE TO SONIC BOOM IN THE LABORATORY AND THE COMMUNITY, (U)

JAN 71 18P GIERKE,H. E. VON NIXON,C. W. ;
REPT. NO. AMRL-TR-69-47
PROJ: AF-7231

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL SOCIETY OF AMERICA, V51 N2 P766-782 1972.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 3 NOV 70.

DESCRIPTORS: (*SONIC BOOM, REACTION(PSYCHOLOGY)), PSYCHOACOUSTICS, ATTITUDES(PSYCHOLOGY), SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT, INTENSITY (U)
IDENTIFIERS: *NOISE POLLUTION, OVERPRESSURE (U)

PRESENT-DAY ESTIMATES REGARDING THE ACCEPTABILITY OF SONIC BOOMS BY MAN ARE DERIVED FROM VARIOUS OBSERVATIONS, OVERFLIGHT PROGRAMS, AND EXPERIMENTAL FIELD AND LABORATORY STUDIES CONDUCTED BOTH WITHIN AND OUTSIDE THE UNITED STATES. THE LOUDNESS AND ANNOYANCE OF INDIVIDUAL BOOMS AND THEIR DEPENDENCE ON THE BOOM OVERPRESSURE AND PRESSURE-TIME FUNCTION AS WELL AS THE COMPLEX REACTION OF INDIVIDUALS, GROUPS, AND COMMUNITIES EXPOSED TO SONIC BOOMS OF VARIED MAGNITUDE AND FREQUENCY ARE DISCUSSED. THE FEW EXPERIMENTS AVAILABLE PROVING THAT EVEN SONIC BOOMS OF THE MAXIMUM INTENSITY PRESENTLY FEASIBLE DO NOT PRODUCE DIRECT MEDICAL INJURY ARE DESCRIBED. BASED ON THE INTEGRATED BODY OF RESULTS OF RECENT PHYSIOLOGICAL, PSYCHOACOUSTIC, BEHAVIORAL, AND SOCIOLOGICAL STUDIES IN VARIOUS COUNTRIES, ESTIMATES OF THE EFFECTS AND ACCEPTABILITY OF REGULAR, FREQUENT SUPERSONIC COMMERCIAL OVERLAND FLIGHT SCHEDULES ARE PRESENTED AND DISCUSSED IN TERMS OF AIRCRAFT NOISE POLLUTION IN GENERAL, AND OF POTENTIAL CERTIFICATION OF AIRCRAFT WITH RESPECT TO NOISE AND SONIC BOOM. FINDINGS SUPPORT THE CURRENT POLICY THAT COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT WILL NOT BE PERMITTED TO FLY OVER THE UNITED STATES UNLESS AND UNTIL THE NOISE FACTORS ARE BROUGHT WITHIN ACCEPTABLE LIMITS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD= 749 277 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SONIC BOOMS AND SLEEP: AFFECT CHANGE AS A FUNCTION OF AGE. (U)

JUN 72 15P SMITH,ROGER C. ;HUTTO,GARY L. ;
MONITOR: FAA-AM 72-24

UNCLASSIFIED REPORT

DESCRIPTORS: (*SLEEP, *SONIC BOOM), BEHAVIOR, STRESS(PHYSIOLOGY), AGING(PHYSIOLOGY), FATIGUE(PHYSIOLOGY), STRESS(PSYCHOLOGY) (U)

THE STUDY CONCERNED THE MEASUREMENT OF MOOD CHANGES RESULTING FROM SIMULATED SONIC BOOMS OCCURRING DURING SLEEP. SUBJECTS FROM THREE AGE GROUPS (21 TO 26, 40 TO 45, AND 60 TO 72 YEARS OLD) SPENT 21 CONSECUTIVE NIGHTS IN A SLEEPING ROOM EQUIPPED FOR SONIC-BOOM SIMULATION. DURING THE SIXTH THROUGH SEVENTEENTH NIGHTS, SIMULATED SONIC BOOMS OF 1.0 PSF 'OUTDOORS' OVERPRESSURE LEVEL (.1 PSF MEASURED INSIDE THE THE SLEEPING ROOMS) WERE PRESENTED HOURLY THROUGHOUT EACH NIGHT. AS THE MEASURE OF MOOD, THE SUBJECTS COMPLETED A COMPOSITE MOOD ADJECTIVE CHECKLIST IN THE EVENING BEFORE RETIRING AND IN THE MORNING AFTER WAKING ON EACH OF THE 21 DAYS. NO CHANGE IN MOODS ATTRIBUTABLE TO THE OCCURRENCE OF SIMULATED SONIC BOOMS WAS FOUND. SUBSTANTIAL EFFECTS RELATING TO THE AGE OF SUBJECTS, IRRESPECTIVE OF BOOM PRESENTATIONS, WERE OBTAINED. IT WAS CONCLUDED THAT SIMULATED SONIC BOOMS OF SUCH LOW INTENSITY WERE UNLIKELY TO HAVE ADVERSE CONSEQUENCES ON THE MOOD STATES OF MOST INDIVIDUALS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 751 931 2/5 6/19 20/1
AGRICULTURAL RESEARCH SERVICE BELTSVILLE MD

AN INTERDISCIPLINARY STUDY OF THE EFFECTS OF REAL AND SIMULATED SONIC BOOMS ON FARM-RAISED MINK (MUSTELA VISION). (U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 72 242P TRAVIS,HUGH F. ;BOND,JAMES ;WILSON,R. L. ;LEEKLEY,J. R. ;MENEAR,J. R. ;
CONTRACT: DOT-FA70WAI-171
MONITOR: FAA-EQ 72-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH WASHINGTON STATE UNIV., SEATTLE, ALASKA UNIV., COLLEGE, AND THE DEPARTMENT OF THE AIR FORCE, WASHINGTON, D. C.

DESCRIPTORS: (*RODENTS, SONIC BOOM), (*SONIC BOOM, STRESS(PHYSIOLOGY)), NOISE, ANIMALS, BEHAVIOR, REPRODUCTION(PHYSIOLOGY), INFECTIOUS DISEASES, PATHOLOGY (U)
IDENTIFIERS: *NOISE POLLUTION, ANIMALS, BEHAVIOR, DOMESTIC ANIMALS (U)

STUDIES WERE CONDUCTED AT THREE SITES ON MITKOF ISLAND, ALASKA, TO DETERMINE THE EFFECTS OR THREE REAL OR THREE SIMULATED SONIC BOOMS OF ABOUT 6 POUNDS PER SQUARE FOOT OVER-PRESSURE UPON REPRODUCTION IN FARM-RAISED MINK. CONTROL ANIMALS WERE NOT BOOMED. NO DIFFERENCES (P>.05) WERE FOUND AMONG EXPERIMENTAL TREATMENTS FOR LENGTH OF GESTATION, NUMBER OF KITS BORN PER FEMALE WHELPING, NUMBER OF KITS ALIVE PER FEMALE AT 5 AND 10 DAYS OF AGE, WEIGHT OF KITS AT 49 DAYS OF AGE, KIT PELT VALUE AND SELLING PRICE. A BEHAVIORAL STUDY SHOWED NO EVIDENCE THAT THE FEMALE MINK UNDER OBSERVATION WERE SUFFICIENTLY DISTURBED BY SONIC BOOMS. RESULTS OF NECROPSY EXAMINATIONS SHOWED NO MINK DEATHS ATTRIBUTABLE TO REAL OR SIMULATED SONIC BOOMS. LIKEWISE, NO EVIDENCE WAS FOUND THAT BACTERIAL DISEASE WAS INDUCED IN THE HERD FOLLOWING EXPOSURE TO SONIC BOOMS. THE CONCLUSION DRAWN FROM THESE STUDIES IS THAT EXPOSURE OF FARM-RAISED MINK TO INTENSE SONIC BOOMS DURING WHELPING SEASON HAD NO ADVERSE AFFECT ON THEIR REPRODUCTION OR BEHAVIOR. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 751 934 20/1 13/13
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH DIV

ADDITIONAL SONIC BOOM DATA RELATED TO TESTS CONDUCTED AT WHITE SANDS, NEW MEXICO, AND EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 72 19P LEE,LLOYD A. ;
MONITOR: FAA-RD 72-114

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, STRESSES), (*STRUCTURAL MEMBERS, SONIC BOOM), STRAIN GAGES, STATISTICAL DATA (U)
IDENTIFIERS: *WINDOWS, OVERPRESSURE (U)

DATA IN THE FORM OF NOTES AND RECORDING WHICH WERE COMPILED DURING THE WHITE SANDS AND EDWARDS AIR FORCE BASE SONIC BOOM TEST PROGRAMS AND WHICH ARE PRESENTLY AVAILABLE IN FILES AT THE BLUME OFFICES WERE REVIEWED TO PRESENT WINDOW MOUNTED STRAIN GAGE READINGS WITH RELATED OVERPRESSURES DURING THE 1965 WHITE SANDS TESTS AND WINDOW SIZES OF THE EDWARDS AFB 1966 TEST STRUCTURES. THESE DATA ARE TO BE USED BY FAA IN CURRENT STUDIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 751 935 13/13 20/1
NEW YORK UNIV BRONX DEPT OF AERONAUTICS AND ASTRONAUTICS

NUMERICAL PREDICTION OF INTERIOR AND STRUCTURAL RESPONSE OF BUILDINGS TO SONIC BOOM OVERFLIGHTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 71-SEP 72,
SEP 72 55P SLUTSKY,SIMON ;ARNOLD,LEE ;
REPT. NO. NYU-AA-72-23
CONTRACT: DOT-FA71WA-2559
MONITOR: FAA-RD 72-116

UNCLASSIFIED REPORT

DESCRIPTORS: (*BUILDINGS, RESPONSE), (*SUPERSONIC FLIGHT, *SONIC BOOM), STRUCTURAL MEMBERS, FLOORS, ROOFS, ACOUSTIC PROPERTIES, MODELS(SIMULATIONS), SUPERSONIC AIRCRAFT, NUMERICAL ANALYSIS (U)

THE REPORT DESCRIBES A PROCEDURE FOR PREDICTING THE STRUCTURAL AND ACOUSTIC RESPONSE OF FULL SCALE ARCHITECTURAL STRUCTURES TO SONIC BOOMS USING LABORATORY TECHNIQUES. IT IS SHOWN THAT THE ESSENTIAL ACOUSTIC PROPERTIES OF A FULL SCALE STRUCTURE LOCATED IN ISTRES, FRANCE COULD BE ACCURATELY SIMULATED ON A SMALL SCALE (1:20) MODEL LOCATED AT N.Y.U. AND THAT THIS MODEL COULD BE USED TO DETERMINE ACOUSTIC IMPULSE RESPONSE FUNCTIONS OF VARIOUS ROOMS UNDER VARYING WINDOW AND DOOR CONFIGURATIONS AND UNDER VARYING SUPERSONIC FLIGHT MACH NUMBERS. THE CALCULATED IMPULSE RESPONSE FUNCTIONS WERE USED IN CONJUNCTION WITH MEASURED SONIC BOOM SIGNATURES FROM MIRAGE III OVERFLIGHTS AT SPEEDS OF MACH 1 AND MACH 2 TO CALCULATE BUILDING RESPONSES. THESE RESPONSES WERE THEN COMPARED WITH MEASURED BUILDING RESPONSES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 294 20/4 20/1
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V AACHEN (WEST GERMANY)

THE WAVE FORMATION AND SONIC BOOM DUE TO A DELTA WING, (U)

MAR 71 24P OSWATITSCH,K. ;SUN,Y. C. ;
REPT. NO. DFVLR-SONDERDRUCK-205

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN THE AERONAUTICAL QUARTERLY, V23 P87-108 MAY 72.

DESCRIPTORS: (*DELTA WINGS, SHOCK WAVES), (*SONIC BOOM, DELTA WINGS), PREDICTIONS, THREE DIMENSIONAL FLOW, FLOW FIELDS, TRAILING EDGE, LEADING EDGES, WEST GERMANY (U)

BY EMPLOYMENT OF THE ANALYTICAL METHOD OF CHARACTERISTICS AND OF A LIMITING PROCEDURE SUITABLE FOR DEALING WITH THE TRAILING EDGE EXPANSION, THE INFLUENCE OF NEAR-FIELD FLOW ON THE FAR-FIELD WAVE FORMATION HAS BEEN INVESTIGATED FOR AN INCIDENT FLAT DELTA WING WITH SUPERSONIC LEADING EDGES. THROUGH CONFINED IN ITS SCOPE TO THE FRONT SHOCK IN THE VERTICAL PLANE OF SYMMETRY OF THE WING AND TO A HOMOGENEOUS ATMOSPHERE WITHOUT DENSITY AND TEMPERATURE GRADIENTS, THE PRESENT ANALYSIS REVEALS FEATURES OF FLOW WHICH ARE INTERESTING FROM THE STANDPOINT OF THE GENERAL THEORY OF THREE-DIMENSIONAL SUPERSONIC FLOW. IT IS FOUND THAT THE FRONT SHOCK DUE TO A DELTA WING WILL AS A RULE BE CANCELLED AT A FINITE DISTANCE FROM THE WING BY THE PLANE-WAVE EXPANSION EMANATING FROM THE TRAILING EDGE. THE OVER-EXPANSION MUST THEN GIVE RISE TO A REAR SHOCK SEPARATE FROM THE FRONT ONE. THUS, AT LEAST IN THE PLANE OF SYMMETRY, A SHARP-FRONT WAVE SIGNATURE CAN NOT, IN GENERAL, BE EXPECTED FROM THE WING AT A DISTANCE BEYOND THE TERMINATING POINT OF THE FRONT SHOCK. THE BOOM SIGNATURE THEN WILL BE QUALITATIVELY DIFFERENT FROM THAT OF A BODY OF REVOLUTION. THE GENERAL NON-EQUIVALENCE OF A WING TO A BODY OF REVOLUTION IN THIS RESPECT SHOULD EVOKE SOME RETHINKING ABOUT SONIC BOOM PREDICTION AND ALLEVIATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M09

AD- 752 472 20/1 20/4
NAVAL ORDNANCE LAB WHITE OAK MD

DISTORTION OF NEAR-SONIC SHOCKS BY WEAKLY TURBULENT LAYERS, (U)

SEP 72 25P TAYLOR,LEONARD S. ;PHINNEY, RALPH E. ;
REPT. NO. NOLTR-72-225
PROJ: NOL-324/FAA

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, SHOCK WAVES), TURBULENCE, FOCUSING, ATMOSPHERIC MOTION, NONLINEAR DIFFERENTIAL EQUATIONS, PARTIAL DIFFERENTIAL EQUATIONS (U)

THE FOCUSING EFFECTS OF TURBULENCE IN THE PROPAGATION MEDIUM UPON NEAR-SONIC SHOCKS ARE STUDIED BY EXTENDING THE THEORY OF SHOCK DYNAMICS TO A MEDIUM WITH RANDOM TEMPERATURE AND PRESSURE VARIATIONS. A PERTURBATION PROCEDURE IS USED TO SOLVE AND RESULTING NONLINEAR PARTIAL DIFFERENTIAL EQUATION. THE RESULTS ARE APPLIED IN A DISCUSSION OF SONIC BOOM DISTORTION IN THE TERRESTRIAL BOUNDARY LAYER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 658 4/1 22/2
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY PALISADES N Y

ON THE GENERATION AND PROPAGATION OF SHOCK WAVES FROM APOLLO ROCKETS AT ORBITAL ALTITUDES. (U)

JUL 71 14P COTTEN,DONALD E. ;DONN, WILLIAM L. ;OPPENHEIM,ALAN ;
REPT. NO. LDGO-1738
CONTRACT: DAAB07-69-C-0250, DA-ARO-D-31-124-71-G90
PROJ: DA-2-0-061102-B-53-B
MONITOR: AROD 6997:21-EN

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN GEOPHYSICAL JNL. OF THE ROYAL ASTRONOMICAL SOCIETY, V26 P149-159 1971.
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH CITY UNIV. OF NEW YORK. SPONSORED IN PART BY GRANT NSF-GA-17454.

DESCRIPTORS: (*MANNED SPACECRAFT, MICROBAROMETRIC WAVES), (*LAUNCH VEHICLES, *SHOCK WAVES), UPPER ATMOSPHERE, SONIC BOOM, ATTENUATION (U)
IDENTIFIERS: APOLLO 12 SPACECRAFT, APOLLO 13 SPACECRAFT, INFRASONICS, RADIATION (U)

ACOUSTIC SIGNALS FROM APOLLO ROCKETS AT ORBITAL ALTITUDE (188 KM) APPEAR TO BE EXPLAINABLE WITH THE ASSUMPTION THAT THE EXHAUST PLUME SERVES AS A CONICAL BODY OF LARGE CROSS-SECTION MOVING SUPERSONICALLY WITH THE ROCKET. THE PRESENCE OF THE SURFACE SIGNAL (1.3 HZ AND HIGHER) IMPLIES THAT PROPAGATION IN THE UPPER ATMOSPHERE OCCURRED AS AN N-WAVE SHOCK CONE WITHOUT THE STRONG ATTENUATION TO WHICH AN ACOUSTIC WAVE OR EVEN A SAW-TOOTHED (SHOCKED) WAVE OF SIMILAR FREQUENCY WOULD BE SUBJECTED. THE SHOCK CONE DOES NOT ATTENUATE BECAUSE ENERGY IS CONTINUALLY RESUPPLIED ALONG THE SHOCK CONE FROM THE VEHICLE AND ITS PLUME ACTING AS A PISTON. CALCULATED OVERPRESSURES DO NOT REDUCE TO ACOUSTIC AMPLITUDES UNTIL THE WAVE IS BELOW 40KM WHERE ACOUSTIC ATTENUATION BECOMES NEGLIGIBLE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 881 20/1
ACOUSTICAL SOCIETY OF AMERICA NEW YORK

PROCEEDINGS OF THE SONIC BOOM SYMPOSIUM (2ND) SPONSORED BY THE ACOUSTICAL SOCIETY OF AMERICA (80TH MEETING) HELD AT HOUSTON, TEXAS ON 3 NOVEMBER 1970, (U)

72 152P RIBNER,HERBERT S. ;HUBBARD, HARVEY H. ;

UNCLASSIFIED REPORT

AVAILABILITY: AVAILABLE FROM BACK-NUMBERS DEPT., AMERICAN INSTITUTE OF PHYSICS, 335 EAST 45 ST., NEW YORK, N. Y. 10017. PC$5.00.

SUPPLEMENTARY NOTE: SPONSORED IN PART BY FEDERAL AVIATION ADMINISTRATION. LIBRARY OF CONGRESS CARD CATALOG NO. 72-96208. INTERNATIONAL STANDARD BOOK NO. 0-88318-201-7.

DESCRIPTORS: (*SONIC BOOM, SYMPOSIA), ACOUSTICS, SUPERSONIC FLIGHT, SHOCK WAVES, PROPAGATION, STRESS(PHYSIOLOGY), HUMANS, ANIMALS, BEHAVIOR (U)

IDENTIFIERS: NOISE POLLUTION, RAY TRACING (U)

A MAJOR ENVIRONMENTAL EFFECT OF SUPERSONIC FLIGHT THAT SETS IT APART FROM OTHER AIRCRAFT OPERATIONS IS THE SONIC BOOM. THE WAVE PATTERN THAT TRAVELS WITH THE AIRCRAFT--RATHER LIKE THE BOW WAVE OF A SHIP--SWEEPS OVER UNDERLYING AREAS AND MIMICS THE ADVANCING SHOCK WAVE OF A MILD EXPLOSION. IMPELLED BY THE PROSPECT OF CIVIL SUPERSONIC TRANSPORT (SST) AIRCRAFT, THERE HAS BEEN A GREAT VOLUME OF RESEARCH ON THE SONIC BOOM AND ITS EFFECTS, PARTICULARLY DURING THE LAST DECADE. THE STATE-OF-THE-ART AS OF 1965 WAS SUMMED UP IN THE FIRST SONIC BOOM SYMPOSIUM SPONSORED BY THE ACOUSTICAL SOCIETY OF AMERICA, HELD IN ST. LOUIS. THE STATE-OF-THE-ART AS OF 1970 WAS LARGELY SUMMED UP IN THE SECOND SONIC BOOM SYMPOSIUM HELD IN HOUSTON FIVE YEARS LATER ON 3 NOVEMBER 1970. THE 1970 SYMPOSIUM CONSISTED AGAIN OF A SERIES OF INVITED PAPERS, FOR THE MOST PART OF A SURVEY NATURE. THE AUTHORS WERE DRAWN FROM THE INTERNATIONAL COMMUNITY OF RESEARCHERS ON SONIC BOOM AND ITS EFFECTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 754 784 13/2
STANFORD RESEARCH INST MENLO PARK CALIF

SUPPORT OF ENVIRONMENTAL PROGRAM PLANNING. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 72 391P MACKIN,JAMES L. ;SCHMIDT, RICHARD A. ;
CONTRACT: N00014-72-C-0445, ARPA ORDER-2195
PROJ: NR-089-091, SRI-1878

UNCLASSIFIED REPORT

DESCRIPTORS: (*DEPARTMENT OF DEFENSE, *ENVIRONMENT), (*RESEARCH MANAGEMENT, ENVIRONMENT), SCIENTIFIC RESEARCH, NATURAL RESOURCES, AIR POLLUTION, WATER POLLUTION, HEAT, ECONOMICS, ELECTRIC POWER PRODUCTION, ENERGY, STRATOSPHERE, EXHAUST GASES, PESTICIDES, NOISE, SONIC BOOM, WEAPON SYSTEMS, MONITORS (U)
IDENTIFIERS: WASTE DISPOSAL, NOISE POLLUTION, OILS, POLLUTION, REMOVAL, *POLLUTION, *RESEARCH MANAGEMENT, ROCKET EXHAUST, SOLID WASTE DISPOSAL, HAZARDOUS MATERIALS, LAND USE, THERMAL POLLUTION, ELECTROMAGNETIC RADIATION HAZARDS, ENVIRONMENTS, SURVEYS, ENVIRONMENTAL IMPACT S (U)

PRINCIPAL ENVIRONMENTAL PROBLEM AREAS OF IMPORTANCE TO THE DEPARTMENT OF DEFENSE WERE IDENTIFIED AND POSSIBLE APPROACHES TO ADVANCED RESEARCH PROJECTS DIRECTED TOWARD SOLUTIONS OF THESE PROBLEMS WERE SUGGESTED TO PROVIDE PARTIAL SOURCE MATERIAL IN SUPPORT OF DEFENSE ADVANCED RESEARCH PROJECTS AGENCY'S RESEARCH PROGRAM PLANNING. TOPICS REGARDING ENVIRONMENTAL IMPACT ANALYSIS, RESOURCES MANAGEMENT, AIR QUALITY, WATER QUALITY, MATERIALS HANDLING AND DISPOSAL, DATA MANAGEMENT AND SPECIAL PROBLEMS WERE INDLUDED. FOR EACH TOPIC, INFORMATION WAS ORGANIZED ACCORDING TO STATEMENT OF THE PROBLEM, STATE OF THE ART, PRESENT ACTIVITIES AND ORGANIZATION, IMPLICATIONS FOR THE DOD, AND RECOMMENDATIONS FOR FURTHER STUDIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 756 787 20/1
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT E V AACHEN (WEST GERMANY)

CLOSED FORM SOLUTION FOR THE SONIC BOOM IN A POLYTROPIC ATMOSPHERE, (U)

APR 72 8P STUFF,R. ;
REPT. NO. DFVLR-SONDERDRUCK-251

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JNL. OF AIRCRAFT, V9 N8 P556-562 AUG 72.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 12 OCT 71.

DESCRIPTORS: (*SONIC BOOM, MATHEMATICAL ANALYSIS), VELOCITY, WEST GERMANY, SHOCK WAVES, FLIGHT PATHS (U)
IDENTIFIERS: METHOD OF CHARACTERISTICS (U)

THE SONIC BOOM PROBLEM FOR TYPICAL AIRCRAFT MANEUVERS IN A POLYTROPIC ATMOSPHERE IS SOLVED ANALYTICALLY USING THE ANALYTIC METHOD OF CHARACTERISTICS. THE LINEARIZED WAVE PROPAGATION, WHICH SERVES AS INITIAL SOLUTION TO THE METHOD OF CHARACTERISTICS, IS SOLVED FIRST. THE CHARACTERISTIC METHOD IS MODIFIED TO ENCOMPASS THE CASE OF AN ONCOMING STREAM WITH VARIABLE SOUND VELOCITY. (AUTHOR MODIFIED ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 756 790 20/1 4/1
NATIONAL AERONAUTICAL ESTABLISHMENT OTTAWA (ONTARIO)

A DETERMINISTIC MODEL OF SONIC BOOM PROPAGATION THROUGH A TURBULENT ATMOSPHERE. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,
NOV 72 24P LEE,B. H. K. ;RIBNER,H. S. ;
REPT. NO. NAE-LR-566
MONITOR: NRC 12981

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, EQUATIONS OF MOTION), ATMOSPHERIC MOTION, TURBULENCE, SHOCK WAVES, PROPAGATION, PRESSURE, CANADA (U)
IDENTIFIERS: WAVE EQUATIONS (U)

THE PROPAGATION OF A WEAK NORMAL SHOCK WAVE THROUGH A TURBULENT ATMOSPHERE IS STUDIED IN TERMS OF AN IDEALIZED MODEL. THE TURBULENT FIELD IS ASSUMED TO BE WEAK AND REPRESENTED BY THE SUPERPOSITION OF TWO INCLINED SHEAR WAVES OF OPPOSITE INCLINATION TO THE MEAN FLOW. THE RESULTING FLOW IS OF A CELLULAR NATURE. THE CELLS ARE RECTANGULAR IN SHAPE AND THE SENSE OF ROTATION OF THE FLOW ALTERNATES FROM CELL TO CELL. IF THE ANGLES MADE BY THE NORMAL OF THE INCIDENT SHEAR WAVES WITH THE DIRECTION OF THE MEAN FLOW ARE GREATER THAN SOME CRITICAL VALUE AN EXPONENTIALLY DECAYING PRESSURE WAVE IS GENERATED BEHIND THE SHOCK. 'SPIKED' OR ROUNDED' WAVEFORMS ARE OBTAINED BY ADDING OR SUBTRACTING THIS PRESSURE WAVE FROM THE STEADY STATE PRESSURE FIELD. AN ILLUSTRATIVE EXAMPLE FOR A MEAN FLOW MACH NUMBER OF 1.0005 IS CONSIDERED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 757 273 20/1
TENNESSEE UNIV SPACE INST TULLAHOMA

FUNDAMENTAL RESEARCH ON ADVANCED TECHNIQUES FOR SONIC BOOM SUPPRESSION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
NOV 72 200P GEOTHERT,B. H. ;PAN,Y. S. ;CHAUDHURI,S. N. ;KOHL,R. ;GRUSCHKA,H. ;

CONTRACT: DOT-FA70WA-2260
MONITOR: FAA-RD 73-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, REDUCTION), INTENSITY, THEORY, AERODYNAMIC CONFIGURATIONS, AIRFRAMES, WINGS, EXHAUST NOZZLES, EXHAUST GASES, SLOTTED FLAPS (U)
IDENTIFIERS: NOISE REDUCTION (U)

A MULTIPHASE THEORETICAL INVESTIGATION ON PREDICTING AND ALLEVIATING SONIC BOOM INTENSITY IS DESCRIBED. A NEW THEORY TO PREDICT SONIC BOOM INTENSITY ON THE GROUND FROM WIND TUNNEL TESTS USING NORMAL SIZE MODELS (AS OPPOSED TO THE VERY SMALL MODELS PRESENTLY USED) WAS DEVELOPED. A RELATIVELY EASY METHOD TO DETERMINE AIRCRAFT CONTOURS WITH DESIRABLE FINITE PRESSURE RISE TIMES IS PRESENTED, AS IS A METHOD TO DETERMINE PHANTOM BODY SHAPES WITH DESIRABLE PRESSURE RISE TIMES WHICH CAN BE SIMULATED BY HEAT ADDITION TO THE FLOW UPSTREAM OF THE AIRCRAFT. IT IS SHOWN THAT A SLOTTED NOZZLE ENGINE EXHAUST HAS THE UNIQUE CAPABILITY TO SHIFT LIFT FROM THE SOLID SURFACE OF THE WING TO THE REGION BEHIND THE WING, WITH A RESULTING REDUCTION IN SONIC BOOM INTENSITY. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 758 239 6/6 20/1
BUREAU OF SPORT FISHERIES AND WILDLIFE SEATTLE WASH WESTERN FISH DISEASE LAB

EFFECT OF SONIC BOOM ON FISH. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 73 72P RUCKER,ROBERT S. ;
PROJ: FAA-202-556-015
MONITOR: FAA-RD 73-29

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *FISHES), (*EGGS, FISHES), (*ECOLOGY, FISHES), MORTALITY RATES, EXPOSURE(PHYSIOLOGY) (U)
IDENTIFIERS: NOISE POLLUTION (U)

A PROGRAM WAS INITIATED TO STUDY THE EFFECT OF SONIC BOOM ON FISH AND FISH EGGS DURING CRITICAL STAGES OF DEVELOPMENT. DURING THE DEVELOPMENT OF FISH EGGS THEY REACH A CRITICAL PERIOD WHERE THEY BECOME SENSITIVE TO VIBRATION OR DISTURBANCE. THIS PROGRAM WAS DESIGNED TO DETERMINE IF THE DISTURBANCES CAUSED BY SONIC BOOMS COULD HAVE A DETRIMENTAL EFFECT DURING THIS PERIOD. IT CONSISTED OF BOTH FIELD AND LABORATORY TESTS CONDUCTED AT SEVERAL NATIONAL FISH HATCHERIES (NFH). FISH EGGS FROM BOTH TROUT AND SALMON WERE REARED IN THE NORMAL MANNER, EXCEPT THAT WHEN THEY WERE IN THEIR MOST CRITICAL PHASE OF DEVELOPMENT THEY WERE EXPOSED TO SONIC BOOMS PRODUCED BY MILITARY AIRPLANES. EGG AND FISH FRY MORTALITIES FROM EXPOSED GROUPS OF EGGS WERE COMPARED TO THOSE FOR CONTROL GROUPS OF EGGS SPAWNED AT THE SAME TIME. THESE COMPARISONS INDICATED THAT THE SONIC BOOM EXPOSURE CAUSED NO INCREASE IN MORTALITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 760 720 13/13 20/1
NEW YORK UNIV BRONX DEPT OF AERONAUTICS AND ASTRONAUTICS

EXPERIMENTAL-ANALYTIC DYNAMIC TECHNIQUES TO DETERMINE ACOUSTIC RESPONSE TO SONIC BOOM WITHIN STRUCTURES. (U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 69-JUN 71,
JUN 71 160P SLUTSKY,SIMON ;ARNOLD,LEE ;
REPT. NO. NYU-AA-70-19
CONTRACT: DOT-FA69WA-2145
MONITOR: FAA-EQ 71-3

UNCLASSIFIED REPORT

DESCRIPTORS: (*BUILDINGS, RESPONSE), (*SONIC BOOM, TRANSIENTS), MODELS(SIMULATIONS), ACOUSTICS, STRUCTURAL PROPERTIES, SIMULATION, POWER SPECTRA, SOUND TRANSMISSION, COMPUTER PROGRAMS, NUMERICAL ANALYSIS (U)
IDENTIFIERS: *ACOUSTIC RESPONSE, *ACOUSTIC WAVES, *SPECTRA, COMPUTER AIDED ANALYSIS (U)

AN EXPERIMENTAL AND THEORETICAL PROGAM WAS UNDERTAKEN TO DETERMINE THE TIME HISTORY OF THE AIRBORNE PRESSURE AND THE CORRESPONDING ACOUSTIC AND STRUCTURAL RESPONSE WITHIN ARCHITECTURAL STRUCTURES DUE TO SONIC BOOM TRANSIENTS, AND TO DETERMINE THOSE FEATURES OF SONIC BOOM SIGNATURE WHICH TEND TO SHAPE THE INTERIOR ACOUSTIC WAVEFORM. A SIMPLE SONIC BOOM WAVE GENERATOR WAS BUILT IN WHICH SMALL SCALE MODELS OF ARCHITECTURAL STRUCTURES WERE TESTED. THE PHENOMENON OF 'SPIKING' OCCURED AND WAS FOUND TO DEPEND ON THE RISE TIME OF THE INCIDENT WAVE, THE WINDOW DIMENSIONS AND THE DISTANCE OF THE MICROPHONE FROM THE WINDOW. INCREASE OF INCIDENT WAVE RISE TIME WAS FOUND TO RADICALLY ALTER THE HIGH FREQUENCY CONTENT OF THE ROOM RESPONSE. ALTHOUGH A COMPLETELY CLOSED STRUCTURE DID NOT GENERATE INTERNAL PRESSURE SPIKES, IT WAS FOUND THAT THE WALL ACCELERATION WAS DEPENDENT ON THE INCIDENT WAVE PRESSURE. THEN IN RESPONSE TO FAST RISE SONIC BOOM WAVES, A SIMPLE WALL COULD EXCITE SMALL OBJECTS, WITH HIGH RESONANT FREQUENCY THAT MIGHT BE COUPLED TO THE WALL. A GENERAL MATHEMATICAL PROCEDURE WAS DEVELOPED TO CALCULATE SYSTEM TRANSFER FUNCTIONS FROM MEASURED DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 761 495 11/2
WYLE LABS HUNTSVILLE ALA

EFFECTS OF REPETITIVE SONIC BOOMS ON GLASS BREAKAGE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
APR 72 252P WHITE,R. W. ;
REPT. NO. WR-72-4
CONTRACT: DOT-FA71WA-2645
MONITOR: FAA-RD 72-43

UNCLASSIFIED REPORT

DESCRIPTORS: (*GLASS, *SONIC BOOM), FATIGUE(MECHANICS), FRACTURE(MECHANICS), COMPUTER PROGRAMS, PRESSURE, SIMULATION (U)
IDENTIFIERS: *WINDOW GLASS, OVERPRESSURE, FORTRAN, FORTRAN 4 PROGRAMMING LANGUAGE (U)

AN EXPERIMENTAL PROGRAM WAS CONDUCTED IN WHICH FIFTY-EIGHT SQUARE PANES (EDGE LENGTHS OF 3 FT AND 4 FT) OF SINGLE STRENGTH WINDOW GLASS WERE EXPOSED TO REPETITIVE SONIC BOOM ENVIRONMENTS IN ORDER TO MEASURE RESPONSE CHARACTERISTICS, DYNAMIC STRENGTHS AND CUMULATIVE DAMAGE EFFECTS FOR RESIDENTIAL WINDOWS CONTINUALLY EXPOSED TO SONIC BOOMS GENERATED BY SUPERSONIC AIRCRAFT. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 762 988 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SIMULATED SONIC BOOMS AND SLEEP: EFFECTS OF REPEATED BOOMS OF 1.0 PSF, (U)

DEC 72 31P COLLINS,WILLIAM E. ;
IAMPIETRO,P. F. ;
PROJ: FAA-AM-B-70-PSY-24, FAA-AM-B-71-PSY-24
MONITOR: FAA-AM 72-35

UNCLASSIFIED REPORT

DESCRIPTORS: (*SLEEP, *SONIC BOOM), NOISE, STRESS(PHYSIOLOGY), ACCLIMATIZATION, PSYCHOPHYSIOLOGY, AGING(PHYSIOLOGY) (U)
IDENTIFIERS: *NOISE POLLUTION (U)

EIGHT MALE SUBJECTS IN EACH OF THREE AGE GROUPS (21-26, 40-45, 60-72 YEARS) SLEPT IN PAIRS IN THE CAMI SONIC BOOM SIMULATION FACILITY FOR 21 CONSECUTIVE NIGHTS. THE FIRST FIVE NIGHTS WERE USED TO ACCLIMATE THE SUBJECTS (NIGHTS 1 AND 2) AND TO OBTAIN BASELINE DATA (NIGHTS 3-5); THE 12 SUBSEQUENT NIGHTS (BOOM) INVOLVED THE HOURLY PRESENTATION OF SIMULATED SONIC BOOMS AT AN OVERPRESSURE LEVEL OF 1.0 PSF (AS THOUGH MEASURED 'OUTDOORS'); DURING FOUR ADDITIONAL NIGHTS (RECOVERY) THERE WERE NO BOOM PRESENTATIONS. ALL-NIGHT RECORDS OF EEG, EOG, EMG, ECG, AND BSR WERE OBTAINED AND ANALYZED. NONE OF THESE PHYSIOLOGICAL MEASURES SHOWED ANY STATISTICALLY SIGNIFICANT EFFECT OF THE BOOM PRESENTATIONS ON NIGHTLY SLEEP PATTERNS. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 763 594 11/2 13/3 20/1
BOOZ-ALLEN APPLIED RESEARCH INC BETHESDA MD

STATISTICAL PREDICTION MODEL FOR GLASS BREAKAGE FROM NOMINAL SONIC BOOM LOADS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 73 216P HERSHEY,ROBERT L. ;HIGGINS, THOMAS H. ;
CONTRACT: DOT-FA72WA-2823
MONITOR: FAA-RD 73-79

UNCLASSIFIED REPORT

DESCRIPTORS: (*BUILDINGS, GLASS), (*GLASS, FAILURE(MECHANICS)), (*SONIC BOOM, BUILDINGS), CONFIGURATION, LOADS(FORCES), STRESSES, PROBABILITY DENSITY FUNCTIONS, CRACKS, RANDOM VARIABLES (U)
IDENTIFIERS: WINDOWS, OVERPRESSURE, BREAKAGE, COMPUTER AIDED ANALYSIS (U)

A STATISTICAL MODEL WAS DEVELOPED WHICH CAN BE USED TO ESTIMATE THE PROBABILITY OF GLASS BREAKAGE FROM SONIC BOOMS AS A FUNCTION OF THEIR NOMINAL OVERPRESSURE. OTHER PARAMETERS WHICH CAN BE TAKEN INTO ACCOUNT IN BREAKAGE PROBABILITY CALCULATIONS WITH THIS MODEL INCLUDE WINDOW SIZE, AIRCRAFT VECTOR, BOOM DURATION, AND WHETHER THE GLASS WAS PREVIOUSLY IN GOOD CONDITION OR CRACKED. A MODEL WINDOW POPULATION HAS BEEN DEVISED FROM AVAILABLE DATA WHICH INCLUDES THE DISTRIBUTIONS OF DYNAMIC AMPLIFICATION FACTORS AND BREAKING PRESSURES FOR SEVEN WINDOW TYPES. PROVISION HAS BEEN MADE IN THE MODEL TO TREAT .61% OF THE WINDOW POPULATION AS CRACKED GLASS. FROM COMPUTER GENERATION OF HISTOGRAMS FROM TEST DATA, THE DISTRIBUTION OF BOTH SONIC BOOM STRESSES AND GLASS STRENGTHS WERE FOUND TO BE LOGNORMAL. BY USE OF THE MODEL, IT WAS ESTIMATED THAT THERE WOULD BE 1.1 BREAKS PER MILLION PANES IN GOOD CONDITION BOOMED AT A NOMINAL OVERPRESSURE OF 1 PSF. THIS ESTIMATE AGREES WELL WITH SONIC BOOM CLAIMS DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 766 326 6/19
MAN-ACOUSTICS AND NOISE INC SEATTLE WASH

THE EFFECT OF SIMULATED SONIC BOOM RISE TIME AND OVERPRESSURE ON ELECTROENCEPHALOGRAPHIC WAVEFORMS AND DISTURBANCE JUDGMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 73 39P MABRY,J. E. ;PARRY,H. J.
;
REPT. NO. MAN-1004
CONTRACT: DOT-FA73WA-3213
PROJ: FAA-202-554-015
MONITOR: FAA-RD 73-115

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTROENCEPHALOGRAPHY, *SONIC BOOM), (*NOISE, *SLEEP), SIMULATION, STRESS(PHYSIOLOGY), AIRCRAFT NOISE, JET AIRCRAFT (U)

THE THREE MAIN OBJECTIVES OF THIS STUDY WERE AS FOLLOWS: DETERMINE THE FEASIBILITY OF INVESTIGATING EFFECT OF SIMULATED SONIC BOOMS ON SOME SLEEP PATTERNS OF PERSONS UNDERGOING ROUTINE ELECTROENCEPHALOGRAPHIC (EEG) EXAMINATIONS; DETERMINE THE EXTENT THAT EEG WAVEFORMS ARE ALTERED BY THE SIMULATED SONIC BOOMS; AND OBTAIN 'DISTURBANCE', JUDGMENTS AS A FUNCTION OF THE SIMULATED BOOM NOISES. RESULTS WERE OBTAINED FROM FIFTY (50) SUBJECTS OF BOTH SEXES WITH AGES RANGING FROM 15 TO 72 YEARS OF AGE. DATA WAS RELEVANT TO RESTING, DOZING, OR LIGHT SLEEP. THE EEG WAVEFORMS FOR RESTING OR DOZING PERSONS WAS NOT CHANGED BY THE SIMULATED BOOM NOISES. IN GENERAL, THE SUBJECTS WERE NOT, 'DISTURBED', BY THE SIMULATED BOOMS. NINETY-TWO (92) PERCENT OF THE SUBJECTS REPORTED NO, 'DISTURBANCE', TO ANY OF THE SIMULATED BOOMS PRESENTED. TWO RISE TIMES OF 15 AND 7 MS WERE EMPLOYED WITH OVERPRESSURES RANGING FROM 0.94 TO 2.85 PSF. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 767 454 13/13 20/1 11/2
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS RESEARCH AND DEVELOPMENT SERVICE

A POTENTIAL DESIGN WINDOW FOR SUPERSONIC OVERFLIGHT BASED ON THE PERCEIVED LEVEL (PLDB) AND GLASS DAMAGE PROBABILITY OF SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 73 28P HIGGINS,THOMAS H. ;
CARPENTER,LARRY K. ;
REPT. NO. FAA-RD-73-116

UNCLASSIFIED REPORT

DESCRIPTORS: (*GLASS, DAMAGE), (*SUPERSONIC FLIGHT, *SONIC BOOM), JET PLANE NOISE, PRESSURE, SONIC FATIGUE, ACOUSTICS, TOLERANCES(PHYSIOLOGY) (U)
IDENTIFIERS: WINDOW GLASS, OVERPRESSURE, SOUND PRESSURE, DESIGN CRITERIA (U)

A POTENTIAL DESIGN WINDOW FOR SUPERSONIC OVERFLIGHT BASED ON THE PERCEIVED LEVEL (PLDB) AND GLASS DAMAGE PROBABILITY OF SONIC BOOMS IS OUTLINED. THE EVALUATION OF A SIMPLE OPERATIONAL METHOD OF ESTIMATING THE PERCEIVED LEVEL (PLDB) OF SONIC BOOMS IS DISCUSSED AND COMPARED WITH THE FOURIER TRANSFORM COMPUTER PROGRAM CALCULATIONS OF PEASE BASED ON THE THEORY OF ZEPLER AND HAREL. THE RESULTING ESTIMATED PERCEIVED LEVELS ARE IN GOOD AGREEMENT I.E., WITHIN 1 TO 2 PLDB OF EACH OTHER IN THE IMPORTANT POTENTIAL CERTIFICATION OR DESIGN WINDOW THAT IS IN THE 90 TO 100 PLDB RANGE. THESE PERCEIVED LEVELS ARE SHOWN TO BE ACCEPTABLE TO 95 TO 100 PERCENT OF THE PEOPLE EXPOSED TO THEM. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD= 768 847 20/1
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF SYSTEMS ENGINEERING MANAGEMENT

ENGINEERING AND DEVELOPMENT PROGRAM PLAN - AIRCRAFT NOISE AND SONIC BOOM. (U)

JUN 73 38P
REPT. NO. FAA-ED-20-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRCRAFT NOISE, ACOUSTIC IMPEDANCE), JET PLANE NOISE, SONIC BOOM, ENGINE NOISE, STRESS(PHYSIOLOGY), TOLERANCES(PHYSIOLOGY), LAW, PLANNING (U)
IDENTIFIERS: NOISE, NOISE EXPOSURE, NOISE REDUCTION, NOISE REDUCTION, NOISE POLLUTION, ENVIRONMENTAL NOISE EXPOSURE MEASUREMENT (U)

THE REPORT DESCRIBES A PROGRAM PLAN DESIGNED TO PROVIDE A DATA BASE FROM WHICH TO DEVELOP RULE MAKING FOR CONTROL AND ABATEMENT OF AIRCRAFT NOISE AND SONIC BOOM. PRIMARY OBJECTIVES ARE TO MINIMIZE THE ENVIRONMENTAL IMPACT OF AIRCRAFT GENERATED NOISE AND SONIC BOOM AND TO DEVELOP PREDICTION, REDUCTION AND CERTIFICATION CRITERIA FOR ALL CATEGORIES OF AIRCRAFT. DEVELOPMENT ACTIVITIES CURRENTLY IN PROGRESS PLUS PROGRAMS PLANNED FOR A PERIOD OF APPROXIMATELY FIVE YEARS ARE DESCRIBED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 768 853 6/19 6/6
TEER (JAMES G) AND CO COLLEGE STATION TEX

STUDIES OF THE EFFECTS OF SONIC BOOM ON BIRDS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 MAR-15 AUG 73, SEP 73 90P TEER,JAMES G. ;TRUETT,JOE C. ;
PROJ: FAA-202-554-015
MONITOR: FAA-RD 73-148

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, *BIRDS), REPRODUCTION(PHYSIOLOGY), GROWTH(PHYSIOLOGY), MORTALITY RATES, SURVIVAL(PERSONNEL), AIRCRAFT NOISE, AIRPORTS (U)

A FIELD STUDY WAS CARRIED OUT NEAR GLEN ROSE, TEXAS TO TRY TO DISCOVER IF OCCURRENCE OF SONIC BOOMS CREATED BY OVERFLYING AIRCRAFT WAS ADVERSELY AFFECTING REPRODUCTION OF WILD BIRDS. SEVERAL MEASURES OF REPRODUCTION SUCCESS IN MOURNING DOVES, MOCKINGBIRDS, CARDINALS, AND LARK SPARROWS WERE COMPARED BETWEEN A TEST AREA AND A CONTROL AREA. THE TEST AREA WAS SUBJECT TO SONIC BOOM OCCURRING TWO OR THREE TIMES A WEEK; THE CONTROL AREA WAS ESSENTIALLY FREE FROM SONIC BOOM DISTURBANCE. IN THE FINAL ANALYSIS, THE AUTHORS COULD FIND NO EVIDENCE THAT SONIC BOOM DISTURBANCE AFFECTED PHASES OF BIRD REPRODUCTION STUDIES IN THE PROGRAM. STUDIES OF THE EFFECTS OF PRESSURE ON GROWTH, REPRODUCTION AND MORTALITY OF BOBWHITE QUAIL WERE MADE IN THE LABORATORY WITH EQUIPMENT DESIGNED TO DELIVER PRESSURE TREATMENTS UNDER CONTROLLED CONDITIONS. RESULTS OF THESE EXPERIMENTS SHOWED THAT THE PRESSURES HAD NO EFFECTS ON HATCHING SUCCESS, GROWTH RATES, OR MORTALITY. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 769 970 20/1 1/3
DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA

ENVIRONMENTAL POLLUTION: NOISE POLLUTION - SONIC BOOM. (U)

DESCRIPTIVE NOTE: REPORT BIBLIOGRAPHY APR 59-FEB 73.
NOV 73 179P
REPT. NO. DDC-TAS-73-74

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES AD-722 910.

DESCRIPTORS: (*SONIC BOOM, *BIBLIOGRAPHIES), (*JET AIRCRAFT, *NOISE POLLUTION), SUPERSONIC AIRCRAFT, JET TRANSPORT PLANES, PUBLIC OPINION, PSYCHOACOUSTICS, LAW, JET PLANE NOISE, SHOCK WAVES, ABSTRACTS (U)

THE REFERENCES IN THE BIBLIOGRAPHY COVER A WIDE RANGE OF THE PARAMETER OF SONIC BOOM AND NOISE POLLUTION, AS WELL AS DAMAGES CAUSED BY IT. CORPORATE AUTHOR/MONITORING AGENCY, SUBJECT, AND PERSONAL AUTHOR INDEXES ARE INCLUDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 771 274 1/3 20/1
BOEING COMMERCIAL AIRPLANE CO SEATTLE WASH

SONIC BOOM LITERATURE SURVEY. VOLUME II. CAPSULE SUMMARIES. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 72-SEP 73, SEP 73 348P RUNYAN,LARRY J. ;KANE, EDWARD J. ;
REPT. NO. D6-41292-2
CONTRACT: DOT-FA72WA-3039
MONITOR: FAA-RD 73-129-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *LITERATURE SURVEYS, SOUND TRANSMISSION, JET PLANE NOISE, JET AIRCRAFT, RESPONSE(BIOLOGY), THRESHOLDS(PHYSIOLOGY), ANIMALS (U)

THE PURPOSE OF THE REPORT IS TO PROVIDE A REFERENCE FOR INVESTIGATORS IN THE FIELD OF SONIC BOOM TO HELP IN ELIMINATING POSSIBLE DUPLICATION OF FUTURE EFFORTS BY COMPILING IN ONE DOCUMENT THE RESULTS OF ALL PUBLISHED SONIC BOOM INVESTIGATIONS. VOLUME 2 CONSISTS OF A COMPREHENSIVE ANNOTATED REFERENCE OF ALL SONIC BOOM STUDIES IN THE FORM OF CAPSULE SUMMARIES. EACH CAPSULE SUMMARY CONTAINS A COMPLETE REFERENCE OF THE PAPER, A STATEMENT OF ITS PURPOSE, A SUMMARY OF SIGNIFICANT RESULTS, A COMPARISON OF THE WORK WITH OTHER SIMILAR PAPERS, AND AN EVALUATION OF THE PAPER. SUBJECT AND AUTHOR INDEXES ARE GIVEN AT THE END OF THE REPORT. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 773 382 20/1 1/3
BOEING COMMERCIAL AIRPLANE CO SEATTLE WASH

SONIC BOOM LITERATURE SURVEY. VOLUME I.
STATE OF THE ART. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 72-SEP 73,
SEP 73 173P RUNYAN,LARRY J. ;KANE,
EDWARD J. ;
REPT. NO. D6-41292-1
CONTRACT: DOT-FA72WA-3039
PROJ: FAA-202-554-015
MONITOR: FAA-RD 73-129-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-771 274.

DESCRIPTORS: *SONIC BOOM, *LITERATURE SURVEYS,
STATE OF THE ART, THRESHOLDS(PHYSIOLOGY),
SOUND TRANSMISSION, JET PLANE NOISE,
RESPONSE(BIOLOGY), ANIMALS (U)

THE REPORT PROVIDES A REFERENCE FOR INVESTIGATORS IN THE FIELD OF SONIC BOOM TO HELP IN ELIMINATING POSSIBLE DUPLICATION OF FUTURE EFFORTS BY COMPILING IN ONE DOCUMENT THE RESULTS OF ALL PUBLISHED SONIC BOOM INVESTIGATIONS. THE REPORT CONTAINS A SUMMARY OF THE CURRENT STATE OF THE ART. ITS PURPOSE IS TO ACQUAINT THE READER WITH THE SUBJECT IN SUFFICIENT DEPTH TO ALLOW EVALUATION OF SUBSEQUENT TECHNICAL WORK OR THE COMPLETION OF CURRENT UNFINISHED INVESTIGATIONS. FUNDAMENTAL CONCEPTS, IDEAS, AND STUDY RESULTS OF SONIC BOOM WORK IN THE AREAS OF GENERATION, PROPAGATION, MINIMIZATION, HUMAN RESPONSE AND SOCIAL CRITERIA, STRUCTURAL RESPONSE, ANIMAL RESPONSE, THRESHOLD MACH NUMBER, SIMULATION METHODS, AND INSTRUMENTATION TECHNIQUES ARE SUMMARIZED. ASPECTS OF SONIC BOOM THAT NEED FURTHER RESEARCH ARE ALSO IDENTIFIED. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 773 451 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SONIC BOOM STARTLE EFFECTS--REPORT OF A FIELD STUDY, (U)

JUL 73 20P THACKRAY,RICHARD I. ; RYLANDER,RAGNAR ;TOUCHSTONE,R. MARK ;
MONITOR: FAA-AM 73-11

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *NOISE POLLUTION, AVIATION MEDICINE, PSYCHOPHYSIOLOGY, SOUND, STIMULATION, REACTION(PSYCHOLOGY), STRESS(PHYSIOLOGY), THRESHOLDS(PHYSIOLOGY), SWEDEN, FEMALES (U)
IDENTIFIERS: *STARTLE RESPONSE (U)

THE STUDY REPORTS THE RESULTS OF A SONIC BOOM FIELD STUDY CONDUCTED IN SWEDEN DURING OCTOBER 1972. TEN FEMALE SUBJECTS WERE TESTED INDOORS ON EACH OF SIX DAYS. TWO AGE GROUPS WERE STUDIED: 20-35 AND 50-65 YEARS. FIGHTER AIRCRAFT FLYING AT VARIOUS HEIGHTS OVER THE TEST SITE PRODUCED BOOMS WITH OUTDOOR OVERPRESSURES RANGING FROM 60-640 N/SQ.M. THE NUMBER OF BOOMS EXTENDED FROM 5 TO 13 PER DAY. SUBJECTS PERFORMED INDOORS ON AN ARM-HAND STEADINESS TASK. THE RESULTS INDICATED THAT OUTDOOR OVERPRESSURES RANGING FROM 70-120 N/SQ.M. (26-35 N/SQ.M. INDOORS) PRODUCED REFLEXIVE ARM-HAND MOVEMENTS IN ABOUT 10 PER CENT OF THE SUBJECTS. BOOMS OF 300 N/SQ.M. (67 N/SQ.M. INDOORS) AND GREATER PRODUCED RESPONSES IN ABOUT 75 PER CENT OF THE SUBJECTS. BETWEEN THESE EXTREMES OF OVERPRESSURE THERE WAS THE SUGGESTION OF A CRITICAL OVERPRESSURE RANGE LYING BETWEEN 150-180 N/SQ.M. (40-46 N/SQ.M. INDOORS) IN WHICH AN ABRUPT INCREASE IN STARTLE RESPONSE OCCURRED. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 775 095 1/2 20/1 1/3
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

A NUMERICAL STUDY OF THE EFFECTS OF AIRCRAFT MANOEUVERS ON THE FOCUSSING OF SONIC BOOMS, (U)

JUL 73 119P ONYEONWU,RONALD O. ;

REPT. NO. UTIAS-192
CONTRACT: AF-AFOSR-1885-70
PROJ: AF-9783
TASK: 978306
MONITOR: AFOSR TR-74-0181

UNCLASSIFIED REPORT

DESCRIPTORS: *JET AIRCRAFT, *FLIGHT MANEUVERS, *SONIC BOOM, *FOCUSING, SHOCK WAVES, ACOUSTIC BEAMS, RAY TRACING, ATMOSPHERE MODELS, MATHEMATICAL MODELS, CANADA (U)

THE EFFECTS OF AIRCRAFT MANEUVERS ON THE FOCUSING OF SONIC BOOMS ARE INVESTIGATED FOR A MODEL ATMOSPHERE WHICH IS PIECEWISE LINEAR IN WIND AND SOUND SPEEDS, AND PIECEWISE CONSTANT IN WIND DIRECTION. RAY-TUBE AREAS AND TRAJECTORIES ARE OBTAINED IN CLOSED FORM FOR A REAL ATMOSPHERE WITH WINDS AND AIRCRAFT IN ARBITRARY MANEUVERS. A MATHEMATICAL FORMALISM IS DEVELOPED FOR IDENTIFYING THE FOCUSING RAY IN GENERAL MANEUVERS, LEADING TO A DIRECT AND ACCURATE DETERMINATION OF THE CAUSTIC SURFACE GROUND INTERCEPT. THE ALGORITHMS DERIVED IN THE ANALYSIS COMPLEMENT THOSE OF HAYES TO FORM THE BASIS FOR A COMPUTER PROGRAM FOR PREDICTING SONIC BOOM PROPERTIES. THERE APPEARS TO BE A TEN-FOLD REDUCTION IN COMPUTING TIME AS COMPARED WITH THE HAYES-HAEFELI PROGRAM. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 775 555 1/1 1/3
CORNELL UNIV ITHACA N Y

THE DESIGN OR OPERATION OF AIRCRAFT TO MINIMIZE THEIR SONIC BOOM, (U)

73 10P SEEBASS,A. R. 1

UNCLASSIFIED REPORT
AVAILABILITY: PAPER COPY AVAILABLE FROM AIAA, 1290 AVENUE OF THE AMERICAS, NEW YORK, N.Y. 10019.
SUPPLEMENTARY NOTE: PRESENTED AT AIAA AIRCRAFT DESIGN, FLIGHT TEST AND OPERATIONS MEETING (5TH) ST. LOUIS, MO., 6-8 AUG 73. PAPER NO. 73-817.

DESCRIPTORS: *SUPERSONIC AIRCRAFT, *SONIC BOOM, *NOISE REDUCTION, SHOCK WAVES, AERODYNAMIC CONFIGURATIONS, SUPERSONIC FLIGHT, OVERPRESSURE (U)
IDENTIFIERS: *DESIGN CRITERIA (U)

MEANS OF REDUCING OR ELIMINATING THE SONIC BOOM THROUGH AERODYNAMIC DESIGN OR AIRCRAFT OPERATION ARE DISCUSSED. THESE INCLUDE DESIGNING AIRCRAFT TO MINIMIZE OR ELIMINATE CERTAIN FEATURES OF THE OVERPRESSURE SIGNATURE, OPERATING AIRCRAFT AT SLIGHTLY SUPERSONIC SPEEDS SO THAT THE SONIC BOOM DOES NOT REACH THE GROUND, AND SEEKING REDUCTIONS THROUGH THE HIGH ALTITUDE-HIGH SPEED FLIGHT CONDITIONS OF HYPERSONIC TRANSPORTS. A SIMPLE COMPUTER PROGRAM HAS BEEN DEVELOPED THAT DETERMINES THE AREA DEVELOPMENT OF THE EQUIVALENT BODY OF REVOLUTIONN REQUIRED TO MINIMIZE VARIOUS SONIC BOOM SIGNATURE PARAMETERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 776 136 6/5 6/19
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

AVIATION MEDICINE TRANSLATIONS: ANNOTATED BIBLIOGRAPHY OF RECENTLY TRANSLATED MATERIAL. VIII. (U)

DEC 73 14P CONSTANT,GREGORY N. ; GOULDEN,D. R. ;GRIMM,E. JEAN ;
PROJ: FAA-AM-A-73-PSY-33, FAA-AM-D-74-PSY-33
MONITOR: FAA-AM 73-19

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED MAY 72, AD-747 125.

DESCRIPTORS: *AVIATION MEDICINE, *BIBLIOGRAPHIES, TRANSLATIONS, STRESS(PHYSIOLOGY), VESTIBULAR APPARATUS, CARDIOVASCULAR SYSTEM, NYSTAGMUS, PERFORMANCE(HUMAN), CARBON MONOXIDE, BLOOD, VISION, SONIC BOOM, AVIATION SAFETY (U)

AN ANNOTATED BIBLIOGRAPHY OF TRANSLATIONS OF FOREIGN-LANGUAGE ARTICLES IS PRESENTED. THE 22 LISTED ENTRIES ARE CONCERNED WITH STUDIES OF EQUILIBRATION TESTS, VESTIBULAR FUNCTION, OPTOKINETIC NYSTAGMUS, ELECTRONYSTAGMOGRAPHY, CARDIOVASCULAR REACTIONS TO NOISE STRESS, STRESS AND PERFORMANCE, APTITUDES FOR FLYING, FACIAL RECONSTRUCTION TECHNIQUES IN THE IDENTIFICATION OF HUMAN REMAINS FROM ACCIDENTS, ATTITUDES AND PERFORMANCE OF AIR TRAFFIC CONTROLLERS, TECHNIQUES FOR DETERMINING LEVELS OF CARBON MONOXIDE IN THE BLOOD, NOISE, VISION, CARDIOLOGY, FLIGHT SAFETY, AND ANIMAL RESPONSES TO SONIC BOOMS. PROCEDURES FOR OBTAINING COPIES OF THE TRANSLATIONS ARE INCLUDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 777 581 6/19
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF AVIATION MEDICINE

A COMPARISON OF THE STARTLE EFFECTS RESULTING FROM EXPOSURE TO TWO LEVELS OF SIMULATED SONIC BOOMS, (U)

DEC 73 14P THACKRAY,RICHARD I. ; TOUCHSTONE,ROBERT M. ;BAILEY,JOE P. ;
REPT. NO. FAA-AM-73-16

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, PSYCHOMOTOR FUNCTIONS, STRESS(PHYSIOLOGY), RESPONSE(BIOLOGY), PERFORMANCE(HUMAN), HEART, EYE, GALVANIC SKIN RESPONSE, REFLEXES, NOISE, AUTONOMIC NERVOUS SYSTEM (U)
IDENTIFIERS: *STARTLE RESPONSES, NOISE POLLUTION, HEART RATE (U)

SUBJECTS WERE EXPOSED INDOORS TO SIMULATED SONIC BOOMS HAVING OUTSIDE OVERPRESSURES OF 50 AND 150 N/SQ M. RISE TIMES WERE HELD CONSTANT AT 5.5 MSECS. IN ADDITION TO THE OUTSIDE MEASUREMENTS, INSIDE MEASURES OF DBLIN AND DBA WERE ALSO OBTAINED. SUBJECTS ATTEMPTED TO HOLD A HAND-STEADINESS DEVICE ON TARGET DURING BOOM EXPOSURE AND AMPLITUDE OF THE ARM-HAND STARTLE RESPONSE WAS DETERMINED. RECORDINGS WERE ALSO OBTAINED OF THE SKIN CONDUCTANCE AND HEART-RATE RESPONSES AS WELL AS THE EYE-BLINK REFLEX. ALTHOUGH THE 50 N/SQ M BOOM PRODUCED SLIGHT ARM-HAND STARTLE RESPONSES IN A SMALL PERCENTAGE OF SUBJECTS, THE FREQUENCY OF THESE RESPONSES WAS SIGNIFICANTLY GREATER TO THE HIGHER BOOM LEVEL. TENTATIVE CONCLUSIONS ADVANCED THAT SONIC BOOMS EXPERIENCED INDOORS MAY CAUSE SLIGHT ARM-HAND STARTLE RESPONSES WHICH COULD HAVE ADVERSE EFFECTS ON OCCUPATIONAL TASKS IN WHICH ARM-HAND STEADINESS IS THE PRINCIPAL SKILL REQUIRED, BUT THAT IT SEEMS UNLIKELY THESE RESPONSES WOULD SIGNIFICANTLY IMPAIR PERFORMANCE ON LESS SENSITIVE PSYCHOMOTOR TASKS. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 778 242 20/1
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

RECENT DEVELOPMENTS IN SONIC-BOOM SIMULATION USING SHOCK TUBES. (U)

APR 73 15P GOTTLIEB,J. J. (GLASS,I. I. ;

CONTRACT: AF-AFOSR-2274-72
PROJ: AF-9783
TASK: 978306
MONITOR: AFOSR TR-74-0613

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN CANADIAN JNL. OF PHYSICS, V52 N3 P207-218 1974.
SUPPLEMENTARY NOTE: TEXT IN ENGLISH; SUMMARIES IN ENGLISH AND FRENCH.

DESCRIPTORS: *SONIC BOOM, *SIMULATORS, *SHOCK TUBES, STRUCTURES, GAS DYNAMICS, ACOUSTICS, WAVE PROPAGATION, COMMUNITY RELATIONS, CANADA (U)
IDENTIFIERS: PYRAMIDAL STRUCTURE (U)

GASDYNAMIC AND ACOUSTIC ANALYSES WERE PERFORMED IN ORDER TO PROVIDE GREATER INSIGHT INTO THE OPERATION OF SONIC-BOOM SIMULATORS UTILIZING SHOCK-TUBE DRIVERS. THREE BASIC SHOCK TUBES WERE CONSIDERED; EACH HAD A PYRAMIDAL DRIVER JOINED AT THE DIAPHRAGM STATION TO A PYRAMIDAL CHANNEL OF THE SAME DIVERGENCE ANGLE (PYRAMIDAL SHOCK TUBE), OR OF A DIFFERENT ANGLE, OR JOINED TO A CONSTANT-AREA CHANNEL. CLASSICAL ACOUSTIC THEORY WAS APPLIED TO OBTAIN NEW ANALYTICAL SOLUTIONS TO DESCRIBE THE WAVE MOTION IN SUCH FACILITIES, IN AGREEMENT WITH EXPERIMENTAL DATA. IN ADDITION, A DETAILED STUDY OF THE NONLINEAR GENERATION AND PROPAGATION FEATURES OF THE N WAVE WAS MADE FOR THE IMPORTANT AND PRACTICAL CASE OF THE PYRAMIDAL SHOCK TUBE. THE WORK DESCRIBED ABOVE IS OF CURRENT INTEREST AS SHOCK-TUBE-TYPE FACILITIES ARE IN PRESENT USE IN FRANCE, GERMANY, ENGLAND, THE UNITED STATES, AND CANADA TO ASSESS SOCIETAL PROBLEMS ASSOCIATED WITH SONIC BOOM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 779 151 20/1 1/3
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

NOISE MECHANISMS. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS NO. 131.
74 376P
REPT. NO. AGARD-CP-131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE FLUID DYNAMICS PANEL SPECIALISTS' MEETING, BRUSSELS, 19-21 SEP 73. NATO FURNISHED.

DESCRIPTORS: *AERODYNAMIC NOISE, *MEETINGS, JET ENGINES, SONIC BOOM, NOISE REDUCTION, SHOCK WAVES, VORTICES, PHYSIOLOGICAL EFFECTS (U)

THIS SPECIALISTS' MEETING WAS HELD TO FOLLOW ON THE MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC BOOM', HELD JOINTLY WITH THE PROPULSION AND ENERGETICS PANEL IN MAY 1969. EMPHASIS ON THIS OCASSION WAS ON THE FUNDAMENTAL PROBLEMS OF NOISE GENERATION AND ATTENUATION; MAIN ASPECTS CONSIDERED WERE NOISE GENERATION AND DAMPING, COMBUSTION AND JET NOISE, SONIC BOOM THEORY AND NOISE DUE TO BOUNDARY AND SHEAR LAYER EFFECTS. THE MEETING CONCLUDED WITH A ROUND TABLE DISCUSSION. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 780 050 6/6
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS RESEARCH AND DEVELOPMENT SERVICE

THE RESPONSE OF SONGBIRDS TO THE SEISMIC COMPRESSION WAVES PRECEDING SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAY 74 28P HIGGINS,THOMAS H. ;
REPT. NO. FAA-RD-74-78
PROJ: FAA-202-554-015

UNCLASSIFIED REPORT

DESCRIPTORS: *BIRDS, *SONIC BOOM, *SEISMIC WAVES, WILDLIFE, RESPONSE(BIOLOGY), AUDIO TAPES, TEST METHODS, TEST EQUIPMENT, RECORDING SYSTEMS, SOUND, SUPERSONIC AIRCRAFT, JET PLANE NOISE (U)
IDENTIFIERS: *ANIMAL BEHAVIOR, NOISE POLLUTION (U)

AMONG THE ENVIRONMENTAL AND OPERATIONAL PROBLEMS STUDIED DURING THE PROGRAM WERE THE EFFECTS OF THE SONIC BOOMS ON WILDLIFE. IN ADDITION TO THE CUSTOMARY SONIC BOOM OVERPRESSURE SIGNATURE MEASUREMENTS, AUDIO TAPE RECORDINGS WERE MADE AT BOTH OUTDOOR AND INDOOR MEASUREMENT SITES AND THESE WERE STUDIED IN REALTION TO THE OTHER MEASURES OBTAINED. ANALYSIS OF THE AUDIO TAPES DISCLOSED AN INTERESTING PHENOMENA. THE CONTINUOUS SONGS OF BIRDS OF THE FIELD WERE COMPLETELY SILENCED 4 TO 8 SECONDS PRIOR TO THE ARRIVAL OF THE AUDIBLE SONIC BOOM. ADDITIONAL AUDIO RECORDINGS, MADE FOR THE SPECIFIC PURPOSE OF VERIFYING THIS COMPLETE SILENCE OF ALL SONGBIRDS 4 TO 8 SECONDS PRIOR TO THE ARRIVAL OF THE SONIC BOOM'S AUDIBLE REPORT AND OVERPRESSURE SIGNATURE MEASUREMENT, WERE IDENTICAL TO THE FIRST OBTAINED. FURTHER STUDY DISCLOSED THAT THIS RESPONSE OF SONGBIRDS COINCIDES WITH THE ARRIVAL OF THE SEISMIC SIGNAL PROPAGATED THROUGH THE GROUND AND PRECEDING THE SONIC BOOM SHOCK WAVE BY 4 TO 8 SECONDS. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 781 899 20/1 13/13 1/2
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

THE RESPONSE OF SOME LEADED WINDOWS TO SIMULATED SONIC BANGS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 73 51P PALLANT,R. J. ;
REPT. NO. RAE-TR-73111
MONITOR: DRIC 9R-37827

UNCLASSIFIED REPORT

DESCRIPTORS: *WINDOWS, *SONIC BOOM, AERODYNAMIC LOADS, DAMAGE ASSESSMENT, OVERPRESSURE, SUPERSONIC AIRCRAFT, GREAT BRITAIN, DYNAMIC RESPONSE (U)

AN INVESTIGATION WAS MADE INTO THE BEHAVIOR OF THE LEAD FRAMEWORK, OR CALMES, IN LEADED-LIGHT WINDOWS DUE TO REPEATED LOADINGS BY SIMULATED SONIC BANGS OF MODERATE AMPLITUDE. THE THRESHOLD AT WHICH DAMAGE OCCURS HAS ALSO BEEN ASSESSED. THIS REPORT DESCRIBES HOW THE TESTS WERE CARRIED OUT AND GIVES RESULTS OF THE MEASUREMENTS TAKEN. THE RESULTS INDICATE THAT SOME SMALL PERMANENT DEFLECTION OF LEADED LIGHTS MAY OCCUR IF THEY ARE SUBJECTED TO REAL SONIC BANGS OVER A LONG PERIOD. CHARACTERISTIC OVERPRESSURES GREATER BY A FACTOR OF 20 THAN THOSE PREDICTED FOR COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT IN THE CRUISE WILL BE REQUIRED TO PRODUCE EVEN A FIRST INDICATION OF DAMAGE. (MODIFIED AUTHOR ABSTRACT) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 804 043 1/3 20/4
BOEING CO RENTON WASH AIRPLANE DIV

COMMERCIAL SUPERSONIC TRANSPORT PROGRAM. PHASE II-A. COMPREHENSIVE REPORT. VOLUME VII-A. SONIC BOOM AND NOISE. (U)

NOV 64 105P
REPT. NO. D6-8680-7
CONTRACT: FA-SS-64-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 5-A BOOK 2, AD-804 042L.

DESCRIPTORS: (*JET TRANSPORT PLANES, SUPERSONIC AIRCRAFT), (*AIRFRAMES, DESIGN), JET ENGINE NOISE, JET PLANE NOISE, SONIC BOOM, SONIC FATIGUE, AIRCRAFT CABINS, AIRPLANE MODELS, MODEL TESTS, SOURCES, FATIGUE(MECHANICS) (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE BOEING COMPANY HAS SUBMITTED FOR PHASE II-A EVALUATION AN AIRPLANE DESIGN, WHICH, IN ITS INTERCONTINENTAL AND DOMESTIC VERSIONS, WILL PROVIDE ECONOMICAL SUPERSONIC TRANSPORTS MEETING THE DIVERSE REQUIREMENTS OF VARIOUS OPERATORS AND ALSO MEETING THE DESIGN OBJECTIVES OF THE FAA. THE TWO MODELS OF THE AIRPLANE ARE IDENTICAL IN ALL RESPECTS EXCEPT FOR OPERATIONAL EMPTY WEIGHT AND MAXIMUM GROSS WEIGHT. BOTH THE DOMESTIC AND INTERCONTINENTAL VERSIONS MEET OR ARE LOWER THAN ALL NOISE OBJECTIVES ESTABLISHED BY THE FAA. NOTABLE PROGRESS HAS BEEN MADE DURING PHASE II-A TOWARD DEVELOPING A SUPERSONIC TRANSPORT THAT HAS BOTH INTERIOR AND EXTERIOR NOISE LEVELS LOWER THAN PRESENT SUBSONIC AIRPLANES. SIGNIFICANT CONFIGURATION CHANGES FROM THE PHASE I PROPOSAL THAT HAVE CONTRIBUTED TO IMPROVEMENT ARE: (1) DEVELOPMENT OF ENGINE INLET AND NOZZLE NOISE SUPPRESSION TECHNIQUES WITH NO PERFORMANCE PENALTY; AND (2) RELOCATION OF ENGINES AFT ON THE WING TO REDUCE ENGINE NOISE HEARD IN THE CABIN. THESE CHANGES, COUPLED WITH TEST-PROVEN STRUCTURAL DESIGN CONCEPTS, WILL ENSURE A 50,000-HOUR FATIGUE LIFE FOR THE AIRPLANE WITH MINIMUM WEIGHT PENALTY. THIS DOCUMENT PRESENTS THE SUBSTANTIATING DATA FOR SONIC BOOM, ENGINE NOISE, INTERIOR NOISE, AND SONIC FATIGUE EFFECT ON STRUCTURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 804 051 1/3
BOEING CO RENTON WASH AIRPLANE DIV

COMMERCIAL SUPERSONIC TRANSPORT PROGRAM. PHASE II-A. COMPREHENSIVE REPORT. VOLUME XX-A. PARAMETRIC AND TRADEOFF STUDIES. (U)

NOV 64 105P
REPT. NO. D6-8680-20
CONTRACT: FA-SS-64-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 18-A, AD-804 050L.

DESCRIPTORS: (*JET TRANSPORT PLANES, SUPERSONIC AIRCRAFT), AIRFRAMES, RANGE(DISTANCE), FLIGHT SPEEDS, SONIC BOOM, AERODYNAMIC CONFIGURATIONS, DESIGN, FEASIBILITY STUDIES, JET ENGINE FUELS, OPERATION, COMMERCIAL PLANES, COSTS (U)
IDENTIFIERS: SUPERSONIC TRANSPORTS, TRADEOFFS (U)

IT IS THE PURPOSE OF THIS DOCUMENT TO SHOW THE RESULTS OF EXTENSIVE PARAMETRIC AND TRADE STUDIES ON THE EFFECTS OF AIRPLANE SPEED, SIZE, AND RANGE ON TOTAL PURCHASE PRICE, DIRECT OPERATING COST, AND SONIC BOOM. THESE PARAMETRIC STUDIES WHICH COVER A WIDE RANGE OF EACH DESIGN VARIABLE, ARE THE BASES FOR SELECTION OF PROPOSED VARIABLE SWEEP SUPERSONIC TRANSPORT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 809 210 20/1
AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

A SONIC BOOM STUDY FOR THE STRUCTURAL ENGINEER. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., 1 JUN 65-1 SEP 66,
MAR 67 106P BAILEY,DURYL ;
REPT. NO. AFWL-TR-66-154
PROJ: AF-5713

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONIC BOOM, SUPERSONIC AIRCRAFT), STRUCTURAL PROPERTIES, DAMAGE ASSESSMENT, ENGINEERING, PRESSURE, MANEUVERABILITY, TERRAIN, METEOROLOGICAL PHENOMENA, MATHEMATICAL ANALYSIS, EQUATIONS, SHOCK WAVES, STRUCTURES, DAMAGE (U)

SONIC BOOMS GENERATE AN N-TYPE PRESSURE WAVE. EQUATIONS AND TABLES ARE PRESENTED FOR THE CALCULATION OF PEAK OVERPRESSURE FOR THE SONIC BOOM GENERATED BY AIRCRAFT IN STRAIGHT LEVEL FLIGHT. AN EQUATION IS ALSO FURNISHED FOR THE CALCULATION OF THE TIME DURATION OF THE SONIC BOOM PRESSURE WAVE. AIRCRAFT MANEUVERS, GROUND TERRAIN, AND METEOROLOGICAL CONDITIONS AFFECT THE PEAK OVERPRESSURE OF THE PRESSURE WAVE. CORRECTIONS FOR THESE EFFECTS CAN ONLY BE ROUGHLY ESTIMATED. DYNAMIC LOAD FACTORS FOR THE PRESSURE WAVES OF SONIC BOOMS ARE PRESENTED. THESE FACTORS MAY BE USED TO CALCULATE THE DYNAMIC DEFLECTION AND STRESS CAUSED BY A SONIC BOOM. SAMPLE CALCULATIONS OF DYNAMIC DEFLECTION AND STRESS FOR A BEAM, PLATE, AND ROOF TRUSS ARE FOUND IN APPENDIXES 3, 4, AND 5 RESPECTIVELY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 816 591 14/2 20/4
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE DIV

A SHOCK-ON-SHOCK TEST FACILITY. (U)

DESCRIPTIVE NOTE: TECHNICAL INFORMATION SERIES, OCT 66 19P HARRIS,CLARENCE J. ;WARREN, W. R. ;PRIDGEN,ROBERT G. ;
REPT. NO. R66SD56
CONTRACT: AF 04(647)-617

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AIAA AERODYNAMIC TESTING CONFERENCE, LOS ANGELES, CALIF. SEP 66, AS PAPER 66-764.

DESCRIPTORS: (*SHOCK TUBES, AERODYNAMICS), (*REENTRY VEHICLES, SHOCK WAVES), (*SUPERSONIC AIRCRAFT, SHOCK WAVES), REFLECTION, SUPERSONIC FLIGHT, HYPERSONIC FLIGHT, TEST FACILITIES, PRESSURE, INTERACTIONS, AERODYNAMIC CHARACTERISTICS, SONIC BOOM, TRANSPORT PROPERTIES, NOSE CONES, HYPERSONIC CHARACTERISTICS, SUPERSONIC CHARACTERISTICS (U)
IDENTIFIERS: DRIVER GASES (U)

IN CURRENT RE-ENTRY TECHNOLOGY AS WELL AS IN SUPERSONIC AIRCRAFT EVALUATION STUDIES THERE IS INTEREST IN THE EFFECTS WHICH OCCUR WHEN A STRONG AERODYNAMIC WAVE TRAVERSES AND REFLECTS FROM A VEHICLE IN SUPERSONIC OR HYPERSONIC FLIGHT. TO STUDY THIS PROBLEM EXPERIMENTALLY IN THE LABORATORY AN EXISTING COMBUSTION DRIVER SHOCK TUNNEL HAS BEEN CONVERTED INTO A HEATED BLOW DOWN WIND TUNNEL - NORMAL BLAST WAVE GENERATOR SHOCK-ON-SHOCK TEST FACILITY. THIS FACILITY HAS BEEN USED TO OBTAIN SHOCK INTERACTION SURFACE PRESSURE DATA ON STING MOUNTED AND WIRE SUPPORTED MODELS. THE TEST FACILITY CONFIGURATION AND THE APPROACH USED PRESENT UNIQUE OPERATIONAL FEATURES. THIS PAPER REPORTS ON THE BASIC FACILITY DESIGN APPROACHES AND CONCEPTS CONSIDERED, THE ACTUAL CONVERSION OF THE SHOCK TUNNEL INTO A SHOCK-ON-SHOCK TEST FACILITY, AND THE RESULTING PERFORMANCE OF THIS FACILITY. ALSO PRESENTED ARE SHOCK-ON-SHOCK MODEL SURFACE TRANSIENT PRESSURE RESULTS OBTAINED USING THIS FACILITY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 900 405 20/1 1/3 12/1 9/2
WYLE LABS EL SEGUNDO CALIF

PREDICTION METHODS FOR NEAR FIELD NOISE ENVIRONMENTS OF VTOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT. FEB 69-OCT 71, MAY 72 244P SUTHERLAND,LOUIS C. ;BROWN, DAVID ;
REPT. NO. WR-71-19
CONTRACT: F33615-69-C-1407
PROJ: AF-1471
TASK: 147102
MONITOR: AFFDL TR-71-180

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKEOFF AIRCRAFT, *AIRCRAFT NOISE), (*NOISE, MATHEMATICAL PREDICTION), (*MATHEMATICAL MODELS, NOISE), AIRPLANE ENGINE NOISE, JET ENGINE NOISE, JET PLANE NOISE, PROPELLER NOISE, AERODYNAMIC NOISE, WHITE NOISE, SONIC BOOM, AIRCRAFT LANDINGS, TAKEOFF, FATIGUE(MECHANICS), AIRFRAMES, VIBRATION, GROUND EFFECT, SOUND TRANSMISSION, REFLECTIVITY, FREQUENCY, BUFFETING, ROTOR BLADES(ROTARY WINGS), REDUCTION, INTENSITY, ACOUSTIC PROPERTIES, GAS FLOW, SHOCK WAVES, TURBULENCE, VORTICES, GAS TURBINES, WALLS, FANS, JETS, POWER SPECTRA, AERODYNAMIC LOADING, LIFT, BLADE AIRFOILS, ANECHOIC CHAMBERS, COMPUTER PROGRAMS, JET AIRCRAFT, HELICOPTERS, BIBLIOGRAPHIES (U)
IDENTIFIERS: J-57 ENGINES, J-57-P-21 ENGINES, NEAR FIELD NOISE, SOUND CONTOURS, STORED ROTORS (U)

THIS REPORT ESTABLISHES A CONSISTENT SET OF PREDICTION METHODS WHICH MAY BE USED TO ESTIMATE NEAR FIELD NOISE LEVELS FOR JET POWERED AND ROTOR/PROPELLER POWERED VTOL AIRCRAFT OPERATING IN CLOSE PROXIMITY TO THE GROUND. THE METHODS PROVIDED UTILIZE AVAILABLE THEORY AUGMENTED EXTENSIVELY BY EXPERIMENTAL DATA WHICH WAS AVAILABLE OR WAS OBTAINED DURING THE PROGRAM. THE NOISE PREDICTION METHODS PRESENTED WILL ALLOW AN ANALYSIS OF NEAR FIELD ENVIRONMENTS OF VTOL AIRCRAFT USING A SIMPLIFIED PROCEDURE SUITABLE FOR MANUAL CALCULATIONS. THE EXPERIMENTAL EFFORT CARRIED OUT IN THE PROGRAM CONSISTED OF NOISE MEASUREMENTS IN THE NEAR FIELD OF A MODEL PROPELLER AND A SUBSONIC JET IN A FREE AND VERTICAL CONFIGURATION. GROUND REFLECTION CORRECTION FACTORS FOR A SIMPLE SOURCE ARE TABULATED ALONG WITH THE COMPUTER PROGRAM LISTING. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A002 266 5/10 20/1
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF AVIATION MEDICINE

BEHAVIORAL, AUTOMATIC, AND SUBJECTIVE REACTIONS TO LOW- AND MODERATE-LEVEL SIMULATED SONIC BOOMS: A REPORT OF TWO EXPERIMENTS AND A GENERAL EVALUATION OF SONIC BOOM STARTLE EFFECTS, (U)

SEP 74 16P THACKRAY,RICHARD I. ; TOUCHSTONE,R. MARK ;BAILEY,JOE P. ;
REPT. NO. FAA-AM-74-9
PROJ: FAA-AM-E-74-PSY-47, FAA-AM-E-75-PSY-47

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *STRESS(PSYCHOLOGY), *PSYCHOLOGICAL TESTS, SIMULATION, INTENSITY, RESPONSE, NOISE POLLUTION, EYE (U)
IDENTIFIERS: *STARTLE EFFECTS, ANNOYANCE, EYEBLINK (U)

TWO SEPARATE STUDIES ARE REPORTED. THE FIRST ATTEMPTED TO DETERMINE A SONIC BOOM EXPOSURE LEVEL BELOW WHICH STARTLE REACTIONS WOULD NOT OCCUR. SUBJECTS WERE EXPOSED INDOORS TO SIX SIMULATED SONIC BOOMS HAVING VARIOUS OUTSIDE OVERPRESSURES. IN THE SECOND STUDY, SUBJECTS WERE EXPOSED INDOORS TO A SERIES OF 12 SIMULATED BOOMS IN ORDER TO ASSESS HABITUAL EFFECTS. AUTOMATIC AND EYEBLINK RESPONSES, AS WELL AS RATINGS OF SUBJECTIVE ANNOYANCE, WERE OBTAINED IN BOTH STUDIES. THE FINAL SECTION OF THE REPORT SUMMARIZES THE EXPECTED BEHAVIORAL, AUTONOMIC, AND SUBJECTIVE EFFECTS OF EXPOSURE TO VARIOUS LEVELS OF SONIC BOOMS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A005 986 6/3
ALABAMA COOPERATIVE WILDLIFE RESEARCH UNIT AUBURN

THE EFFECT OF SONIC BOOM ON THE NESTING AND BROOD REARING BEHAVIOR OF THE EASTERN WILD TURKEY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 75 45P LYNCH,THOMAS E. ;SPEAKE, DAN W. ;
MONITOR: FAA-RD 75-2

UNCLASSIFIED REPORT

DESCRIPTORS: *TURKEYS, *SONIC BOOM, *STRESS(PHYSIOLOGY), REACTION(PSYCHOLOGY), REPRODUCTION(PHYSIOLOGY), BEHAVIOR, TEST METHODS, WILDLIFE (U)
IDENTIFIERS: DOT/58, DOT/51 (U)

TWENTY WILD TURKEY HENS WERE CAPTURED AND EQUIPPED WITH 164 MHZ TRANSMITTERS. THE NEST SITES OF EIGHT HENS WERE SUCCESSFULLY LOCATED BY TELEMETRIC TRIANGULATION AND FOUR OF THESE WERE SUBJECTED TO BOTH REAL AND SIMULATED SONIC BOOMS. HENS WITH YOUNG WERE ALSO LOCATED BUT WERE SUBJECTED TO SIMULATED SONIC BOOMS ONLY. SONIC BOOMS DID NOT INITIATE ANY ABNORMAL BEHAVIOR BEHAVIOR IN WILD TURKEYS THAT WOULD RESULT IN DECREASED PRODUCTIVITY.(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A007 205 20/1
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THE SONIC BOOM. (U)

FEB 75 36P ZHILIN,YU. L. ;
REPT. NO. FTD-MT-24-0565-75

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: WORKING COPY MACHINE TRANS. OF TSENTRALNYI AERODIDRODINAMICHESKII INSTITUT. UCHENYE ZAPISKI (USSR) V2 N3 P1-11 1971.

DESCRIPTORS: *SONIC BOOM, *SUPERSONIC FLIGHT, *ACOUSTIC FIELDS, AIRCRAFT NOISE, MATHEMATICAL MODELS, SHOCK WAVES, EQUATIONS, ATMOSPHERIC PHYSICS, TRANSLATIONS, USSR (U)

THE SONIC BOOM--TRANSLATION.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD-A009 296 5/10 20/1 1/3
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

PSYCHOPHYSICAL TESTS OF POTENTIAL DESIGN/ CERTIFICATION CRITERIA FOR ADVANCED SUPERSONIC AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 75 83P HIGGINS,THOMAS H. ;
SANLORENZO,ERNEST A. ;
REPT. NO. GASL-TR-789
CONTRACT: DOT-FA73WA-3203
MONITOR: FAA-RD 75-10

UNCLASSIFIED REPORT

DESCRIPTORS: *SUPERSONIC AIRCRAFT, *SONIC BOOM, *PSYCHOACOUSTICS, SONIC FATIGUE, JET ENGINE NOISE, ACOUSTIC SIGNATURES, ACOUSTIC MEASUREMENT, RESPONSE(BIOLOGY), NOISE POLLUTION (U)
IDENTIFIERS: DOT/4DZ/DA, DOT/5B (U)

A SUBJECTIVE VALUATION OF SIMULATED SONIC BOOMS HEARD INDOORS AND OUTDOORS HAS BEEN CARRIED OUT TO ASSESS THE VALIDITY OF A SIMPLE FORMULATION FOR ESTIMATING PERCEIVED NOISE LEVELS. USING A PSYCHOACOUSTIC EXPERIMENT DESIGN BASED ON MAGNITUDE ESTIMATION OF THE PERCEIVED LEVEL, IT WAS SHOWN THAT THE SUBJECTIVE RESPONSE WAS CONSISTENT WITH THE PREDICTIONS OF BOTH THE SIMPLE FORMULA FOR PLDB AS WELL AS PLDB DETERMINED FROM AN ANALYSIS OF THE SONIC BOOM STIMULI USING THE MARK 7 PROCEDURE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A009 656 20/1 1/3
MAN-ACOUSTICS AND NOISE INC SEATTLE WASH

ESTABLISHING CERTIFICATION/DESIGN CRITERIA FOR ADVANCED SUPERSONIC AIRCRAFT UTILIZING ACCEPTANCE, INTERFERENCE, AND ANNOYANCE RESPONSE TO SIMULATED SONIC BOOMS BY PERSONS IN THEIR HOMES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 73 101P MABRY,J. E. ;ONCLEY,P.
B. ;
REPT. NO. MAN-1010
CONTRACT: DOT-FA74WAI-444
MONITOR: FAA-RD 75-44

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *COMMERCIAL AIRCRAFT, *SUPERSONIC TRANSPORTS, SIMULATION, COMMUNITIES, NOISE POLLUTION, SURVEYS, RESIDENTIAL SECTION, ACCEPTABILITY, THRESHOLD EFFECTS, STRESS(PSYCHOLOGY), NOISE REDUCTION, STANDARDS (U)
IDENTIFIERS: DOT/5B, DOT/4D2/DA (U)

TWO MAIN OBJECTIVES OF THE STUDY WERE: (1) TO ESTABLISH A THRESHOLD OF ACCEPTABILITY FOR COMMERCIAL AIRCRAFT SONIC BOOMS, (2) TO INVESTIGATE AND DEVELOPE THE TECHNOLOGY TO PROVIDE SIMULATION TO ANY COMMUNITY NOISE PROBLEM. SEVEN COMMUNITY NOISE SIMULATION SYSTEMS WERE DESIGNED AND FABRICATED, AND SIMULATED SONIC BOOMS WERE INTRODUCED, VIA THESE SYSTEMS, INTO THE HOMES OF TWELVE SUBJECT FAMILIES. ACCEPTANCE, INTERFERENCE, AND ANNOYANCE RESPONSE DATA WERE MEASURED. THREE BOOM LEVELS AND TWO FREQUENCY SCHEDULES WERE STUDIED. IT WAS CONCLUDED THAT FOR ESTABLISHING A DESIGN/CERTIFICATION SONIC BOOM THRESHOLD OF ACCEPTABILITY FOR ADVANCED SUPERSONIC TRANSPORTS, A LEVEL OF 87 DB SHOULD BE CONSIDERED FOR INDOOR LIVING WITH NOT MORE THAN FIFTEEN DAILY BOOM EXPOSURES (NO NIGHTTIME BOOMS). IT WAS ALSO CONCLUDED THAT THE SIMULATION DEVELOPED CAN BE USED TO ESTABLISH STANDARDS INVOLVING TRAFFIC NOISE, NOISE FROM AIRPORTS, CONSTRUCTION NOISE, AND EFFECTS OF INDUSTRIAL NOISE ON SURROUNDING COMMUNITIES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A009 663 20/1 5/10 1/3 6/19
H H AEROSPACE DESIGN CO ELMSFORD N Y

SURVEY OF SONIC BOOM PHENOMENA FOR THE NON-SPECIALIST. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 74-FEB 75,
FEB 75 106P SLUTSKY,SIMON ;
REPT. NO. HHA-14
CONTRACT: DOT-FA74WAI-468
MONITOR: FAA-RD 75-68

UNCLASSIFIED REPORT

DESCRIPTORS: *STRESS(PHYSIOLOGY), *SONIC BOOM, *ENVIRONMENTS, ANIMALS, SUPERSONIC AIRCRAFT, ACOUSTIC WAVES, WAVE PROPAGATION, PHYSIOLOGICAL EFFECTS, RESPONSE(BIOLOGY), STRUCTURAL RESPONSE (U)
IDENTIFIERS: DOT/4DZ/DA, DOT/5B (U)

THE PURPOSE OF THIS DOCUMENT IS TO MAKE AVAILABLE TO THE NON-SPECIALIST AND NON-SCIENTIST A REVIEW OF THE TECHNICAL CONCEPTS UNDERLYING THE WORK DONE IN THE FIELD OF SONIC BOOM RESEARCH. IT CONTAINS A NON-TECHNICAL DISCUSSION OF THE ACOUSTIC MECHANISMS WHICH ARE FUNDAMENTAL IN SONIC BOOM PHENOMENA, USING PHOTOGRAPHS OF WATER WAVE ANALOGUES. THEN THE REPORT DISCUSSES A VARIETY OF BASIC ASPECTS INCLUDING: GENERATION, PROPAGATION, MINIMIZATION, HUMAN RESPONSE AND SOCIAL CRITERIA, STRUCTURAL AND WILDLIFE RESPONSE, THRESHOLD MACH NUMBER OPERATIONS AND SIMULATION METHODS. THE REPORT SITES MANY REFERENCES AND DRAWS EXTENSIVELY ON A RECENT REVIEW FOR INVESTIGATORS IN THE FIELD OF SONIC BOOM PREPARED BY L. J. RUNYAN AND E. J. KANE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A010 488 20/1 20/4
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

SIMULATION OF A TRAVELLING SONIC BOOM IN A PYRAMIDAL HORN. (U)

DESCRIPTIVE NOTE: INTERIM REPT.,
JUL 74 231P GOTTLIEB,JAMES JOSEPH ;
REPT. NO. UTIAS-196
CONTRACT: AF-AFOSR-2274-72
PROJ: AF-9783
MONITOR: AFOSR TR-75-0711

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *ACOUSTIC WAVES, *ACOUSTIC HORNS, SIMULATORS, SHOCK TUBES, SHOCK WAVES, MASS FLOW, FLOW RATE, CANADA (U)

IN ORDER TO ASSESS CURRENT SOCIETAL PROBLEM ASSOCIATED WITH THE SONIC BOOM, A HORN-TYPE SIMULATOR WAS CONSTRUCTED AT THE INSTITUTE FOR AEROSPACE STUDIES, UNIVERSITY OF TORONTO (UTIAL). THE SIMULATOR HORN IS IN THE FORM OF A HORIZONTAL CONCRETE PYRAMID, WHICH IS 25 M LONG AND HAS 3-M-SQUARE BASE. AT ITS APEX A SPECIALLY-DESIGNED VALVE IS USED TO CONTROL THE MASS-FLOW RATE OF AIR FROM A HIGH-PRESSURE RESERVOIR INTO THE HORN WHERE THE FLOW GENERATES A SIMULATED SONIC BOOM OR TRAVELLING N-WAVE OF SUITABLE AMPLITUDE AND DURATION, AND ACCEPTABLY-SHORT RISE TIME. ALTERNATIVELY, A SHOCK-TUBE DRIVER CAN BE INSTALLED AT THE APEX AND USED FOR GENERATING SHORT-DURATION AND RAPID RISE-TIME SONIC BOOMS. FOR THE MASS-FLOW VALVE MODE OF OPERATION OF HIGH-FREQUENCY SOUND ABSORBER CAN BE INSTALLED NEAR THE APEX OF THE HORN TO FILTER OUT OF THE PASSING N-WAVE UNDESIRABLE JET NOISE THAT IS PRODUCED BY THE HIGH-SPEED TURBULENT FLOW AT THE VALVE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A012 090 20/1 1/3
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

AIRCRAFT NOISE GENERATION, EMISSION AND REDUCTION. (U)

DESCRIPTIVE NOTE: LECTURE SERIES.
JUN 75 187P
REPT. NO. AGARD-LS-77

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED IN BELGIUM 16-17 JUN 75, WEST GERMANY 19-20 JUN 75, AND IN THE UNITED KINGDOM 23-24 JUN 75. NATO FURNISHED.

DESCRIPTORS: *JET AIRCRAFT, *AIRCRAFT NOISE, JET ENGINE NOISE, PROPELLER NOISE, SONIC BOOM, NOISE REDUCTION, PHYSIOLOGICAL EFFECTS, LEGISLATION, NATO (U)
IDENTIFIERS: *NOISE SOURCES, *NOISE ABATEMENT (U)

THE PHYSICAL PROPERTIES OF AIRCRAFT NOISE ARE SUMMARIZED, WITH SPECIAL EMPHASIS ON JET NOISE AND FAN-COMPRESSOR-PROPELLER-ROTOR NOISE. TOPICS INCLUDE ACOUSTIC FUNDAMENTALS, NOISE SOURCE CHARACTERISTICS AND INTERACTIONS, ATMOSPHERIC PROPAGATION, AIRFRAME NOISE, SONIC BOOM, DUCT LINER AND MUFFLER THEORY. DURING THE SERIES, RESEARCH AND TECHNOLOGY ACTIVITIES RELATED TO JET ENGINE NOISE AND ITS CONTROL ARE DISCUSSED, AND THE IMPACT OF THIS NOISE ON PEOPLE AND COMMUNITIES AND AIRCRAFT OPERATIONAL PROCEDURES FOR NOISE MINIMISATION ARE ALSO REVIEWED. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD-A014 965 1/3 1/1 4/2
KAMAN AEROSPACE CORP BLOOMFIELD CONN

TEST AND EVALUATION OF A REAL-TIME SIMULATED TRANSCONTINENTAL SUPERSONIC BOOMLESS FLIGHT SYSTEM. VOLUME I. MAIN TEXT AND APPENDIX A. (U)

DESCRIPTIVE NOTE: FINAL REPT. 16 NOV 73-19 NOV 74, APR 75 235P BUNDGAARD,ROBERT C. ;
CONTRACT: DOT-FA74WA-3363
MONITOR: FAA-RD 75-131-1

UNCLASSIFIED REPORT

DESCRIPTORS: *SUPERSONIC AIRCRAFT, *SUPERSONIC FLIGHT, SONIC BOOM, METEOROLOGICAL DATA, COMMUNICATIONS NETWORKS, WEATHER FORECASTING, COMPUTER GRAPHICS, COMPUTER PROGRAMS (U)
IDENTIFIERS: *TRANSCONTINENTAL FLIGHTS, *BOOMLESS SUPERSONIC FLIGHT, DOT/4DZ/DA, DOT/4IZ/IA (U)

IN THE INVESTIGATION REPORTED, NUMERICAL METHODS SIMULATED SUPERSONIC FLIGHT CARRIED OUT IN REAL-TIME AND CONCURRENTLY AT PRESENT TIME. A COMPUTER PROGRAM IDENTIFIES, ACQUIRES, ANALYZES AND PREDICTS THE INFORMATION NEEDED IN ORDER TO PLAN, FLY AND VERIFY BOOMLESS FLIGHT. IT OPTIMIZES THE CUT-OFF MACH TIME-GAIN IN TRADE-OFF ALONG WITH OTHER PERTINENT NECESSARY CONSIDERATIONS NOW BEING REGULARLY CARRIED OUT IN THE ADVANCED AIR OPERATIONS OF TODAY. FOR COMMUNICATION INFORMATION IN CURRENT REAL-TIME FOR BOOMLESS TRANSCONTINENTAL FLIGHTS, THE INVESTIGATION UTILIZED NATIONWIDE NETWORKS: ARINC, UNINET. THE PROGRAM FORESEES THE FUTURE CONDITIONS AFFECTING THE CUT-OFF MACH FLIGHT PERFORMANCE IN SUFFICIENT TIME FOR CARRYING OUT RELIABLE PREFLIGHT PLANNING AND FOR MONITORING THE IN-FLIGHT MODIFICATIONS JUST AHEAD OF THE AIRCRAFT, UTILIZING THE APPROPRIATE PREDICTION OF ATMOSPHERIC CONDITIONS (BOOM-AHEAD COMPUTER). (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A028 512 1/3 20/1 1/2
BOOZ-ALLEN APPLIED RESEARCH INC BETHESDA MD

STATISTICAL MODEL OF SONIC BOOM STRUCTURAL DAMAGE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 76 142P HERSHEY,ROBERT L. ;HIGGINS, THOMAS H. ;
CONTRACT: DOT-FA72WA-2823
MONITOR: FAA-RD 76-87

UNCLASSIFIED REPORT

DESCRIPTORS: *SONIC BOOM, *DAMAGE ASSESSMENT, STRUCTURAL RESPONSE, AIRCRAFT NOISE, GLASS, WINDOWS, BRICK, OVERPRESSURE (U)

THE PROBABILITIES OF STRUCTURAL DAMAGE FROM SONIC BOOMS WERE ESTIMATED FOR VARIOUS SUSCEPTIBLE STRUCTURAL ELEMENTS USING A STATISTICAL MODELING TECHNIQUE. THE BREAKAGE PROBABILITIES WERE FOUND TO VARY WIDELY WITH THE SPECIFIC MATERIAL CONFIGURATION, BUT TO CONSISTENTLY INCREASE WITH INCREASING NOMINAL OVERPRESSURES. THE RANGES OF BREAKAGE PROBABILITIES AT A NOMINAL OVERPRESSURE OF 1 PSF FOR TYPICAL CONFIGURATIONS OF SUSCEPTIBLE MATERIALS WERE AS FOLLOWS: WINDOWS--.000004 TO .00000003, PLASTER--.0003 TO .0000005, BRIC-A-BRAC--.000001 TO .00000001, BRICK WALLS--.0000006 TO .000000001. THE RESULTS OF THE MODELING TEND TO AGREE WELL WITH SONIC BOOM CLAIMS EXPERIENCE. (U)

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