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SHORT TAKE-OFF PLANES

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SHORT TAKE-OFF PLANES

A DDC BIBLIOGRAPHY

DDC-TAS-72-74

JANUARY 1973

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13. ABSTRACT

This bibliography contains unclassified and unlimited references on Short Take-Off Planes. Discussed are design, configurations, wing-body configurations, flight testing, wind tunnel tests, aerodynamic configurations, aerodynamic characteristics, handling qualities, performance and stability of Short Take-Off Planes. Corporate Author-Monitoring Agency, Subject, Title, and Personal Author Indexes are included.

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Observation Planes						
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Handling						
Performance(Engineering)						
Wind Tunnel Tests						
Lift						
Aerodynamic Configurations						
Aerodynamic Characteristics						
Wing-Body Configurations						
Tactical Warfare						
Tactical Air Support						
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A DDC BIBLIOGRAPHY

DDC-TAS-72-74

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UNCLASSIFIED

F O R E W O R D

This bibliography consists of 150 unclassified and unlimited references pertaining to *Short Take-Off Planes*. These references were selected from entries processed into the Defense Documentation Center's data bank during the period of January 1960 through August 1972. Individual entries are arranged in AD number sequence under the heading AD Bibliographic References.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL

ROBERT B. STEGMAIER, JR.
Administrator
Defense Documentation Center

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TITLE	T-1
PERSONAL AUTHOR	P-1

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-257 571
VEHICLE RESEARCH CORP PASADENA CALIF

DEVELOPMENT OF METHODS FOR PREDICTING V/STOL AIRCRAFT CHARACTERISTICS (U)

DEC 60 · 1V RETHORST,SCOTT;ROYCE,W.W.;
REPT. NO. 7
CONTRACT: NONR309900

UNCLASSIFIED REPORT

DESCRIPTORS: *HELICOPTERS, *LOAD DISTRIBUTION, *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, AIRFRAMES, AIRPLANES, CONVERTIBLE AIRPLANES, DESIGN, FLIGHT, MATHEMATICAL ANALYSIS, MATHEMATICAL PREDICTION, PROPELLERS (AERIAL), STABILITY, VARIABLE-PITCH PROPELLERS (U)

ANALYSES ARE DEVELOPED WHICH ENABLE PREDICTION OF THE PERFORMANCE CHARACTERISTICS OF A GENERALIZED SPECTRUM OF V/STOL AIRCRAFT. THE ANALYSES ALSO DEFINE OPTIMUM CONFIGURATIONAL FEATURES WITHIN THIS BROAD SPECTRUM. A RESOLUTION TO THE CONFLICT BETWEEN THE HOVERING AND FORWARD FLIGHT REGIMES IS PROVIDED BY THE ANALYSIS. BOTH AERODYNAMIC AND STRUCTURAL WEIGHT ASPECTS ARE INVESTIGATED. THESE TWO BASIC FACTORS ARE ANALYZED SEPARATELY, AND THEN COMBINED TO PROVIDE AN INTEGRATED ANALYSIS AS A BASIS FOR QUANTITATIVE PERFORMANCE PREDICTION. THE ANALYSIS DEFINES QUANTITATIVELY THE PERFORMANCE POTENTIAL OF ANY VTOL VEHICLE AS A FUNCTION OF ITS GEOMETRY, OPERATING CONDITIONS, AND WEIGHT. THIS UNIQUE POTENTIAL IS CHARTED TO ILLUSTRATE THE VARIOUS TRADE-OFFS IN PERFORMANCE CHARACTERISTICS AVAILABLE TO THE OPERATOR. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-257 800
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

A FLIGHT EXAMINATION OF OPERATING PROBLEMS OF V/STOL AIRCRAFT IN STOL-TYPE LANDING AND APPROAC (U)

JUN 61 IV INNIS,ROBERT C.;QUIGLEY,HERVEY C.;
REPT. NO. TN D 862

UNCLASSIFIED REPORT

DESCRIPTORS: *AERODYNAMIC CHARACTERISTICS, *CONTROL SYSTEMS, *SHORT TAKE-OFF PLANES, *TRANSPORT PLANES, *VERTICAL TAKE-OFF PLANES, AIRPLANE LANDINGS, CONTROL, DRAG, FLIGHT TESTING, LIFT, PITCH (MOTION), ROLL, STABILITY, STALLING (U)

THE OPERATING ENVELOPE OF A LARGE TWIN-ENGINED STOL AIRCRAFT HAS BEEN EXAMINED AND GENERAL LIMITATIONS HAVE BEEN POINTED OUT WHICH THE PILOT MUST CONSIDER WHEN CHOOSING A MINIMUM LANDING APPROACH SPEED FOR STOL AIRCRAFT. THE SIGNIFICANCE OF SATISFACTORY STABILITY AND CONTROL CHARACTERISTICS IN THIS REGARD IS DISCUSSED. THE PROBLEMS REVIEWED IN THE REPORT WOULD ALSO BE REPRESENTATIVE OF THOSE OF A LARGE, OVER-LOADED VTOL AIRCRAFT OPERATING IN AN STOL MANNER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-257 882
WICHITA STATE UNIV KANS

ACHIEVING CONSISTENCY IN MAXIMUM PERFORMANCE STOL LANDINGS (U)

JAN 61 1V CRAIG,A.J.

REPT. NO. ER 351
CONTRACT: DA44 177TC354
MONITOR: TRECOM TR-61-41

UNCLASSIFIED REPORT

DESCRIPTORS: *AERODYNAMIC CHARACTERISTICS, *AIRPLANE LANDINGS, *SHORT TAKE-OFF PLANES, *TRANSPORT PLANES, AIRPLANES, FLIGHT PATHS, FLIGHT TESTING, INSTRUMENTATION, LANDING FIELDS, LANDINGS, MANEUVERABILITY, PILOTS, TEST METHODS, TESTS (U)
IDENTIFIERS: U-1 AIRCRAFT (U)

FACTORS INFLUENCING THE ACHIEVEMENT OF MINIMUM DISTANCE LANDINGS OVER A BARRIER WERE INVESTIGATED TO DETERMINE WHAT MIGHT BE DONE TO PROVIDE CONSISTENCY IN LANDING IN A COMPUTED MINIMUM DISTANCE. IT WAS FOUND THAT THE PILOT REGULARLY EXTRACTED THE MAXIMUM AERODYNAMIC PERFORMANCE OF THE AIRPLANE, BUT THAT LIMITATIONS ACCOMPANYING MAXIMUM AERODYNAMIC PERFORMANCE PREVENTED CONSISTENTLY SHORT LANDINGS. THE PRIMARY LIMITATION WAS THE INABILITY TO FLATTEN OR STEEPEN THE DESCENT PATH DURING THE APPROACH TO THE BARRIER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-258 268
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

STOL CHARACTERISTICS OF A PROPELLER-DRIVEN, ASPECT-RATIO-10, STRAIGHT-WING AIRPLANE WITH BOUNDARY-LAYER CONTROL FLAPS, AS ESTIMATED FROM LARGE-SCALE WIND-TUNNEL TESTS (U)

JUN 61 1V WEIBERG,JAMES A.;HOLZHAUSER,CURT A.;
REPT. NO. TN D 1032

UNCLASSIFIED REPORT

DESCRIPTORS: *AERODYNAMIC CHARACTERISTICS, *BOUNDARY LAYER CONTROL, *FLAPS, *LANDINGS, *SHORT TAKE-OFF PLANES, *TAKE-OFF, AIRPLANE MODELS, ASPECT RATIO, BOUNDARY LAYER CONTROL SYSTEMS, DUAL-ROTATION PROPELLERS, FLIGHT SPEEDS, LIFT, MODEL TESTS, PITCH (MOTION), ROLL, STABILITY, TESTS, TRANSPORT PLANES, WIND TUNNEL MODELS (U)

RESEARCH PRESENTED RELATIVE TO THE TAKE-OFF AND LANDING DISTANCES POSSIBLE WITH A CONVENTIONAL PROPELLER-DRIVEN TRANSPORT-TYPE AIRPLANE INDICATED THAT IF HIGHLY EFFECTIVE FLAPS WERE USED IN COMBINATION WITH LARGE AMOUNTS OF POWER TO AUGMENT LIFT (STOL), THE LANDING AND TAKE-OFF DISTANCES WOULD BE LESS THAN HALF OF THE DISTANCES FOR CONVENTIONAL OPERATION. THE STUDY IS BASED ON THE WIND-TUNNEL TESTS OF A MODEL WITH BLC ON THE TRAILING-EDGE FLAPS AND CONTROL SURFACES. AT THE LOWEST SPEEDS CONSIDERED (ABOUT 50 KNOTS), ADEQUATE LONGITUDINAL STABILITY WAS OBTAINED BUT THE LATERAL AND DIRECTIONAL STABILITY WERE UNSATISFACTORY. AT THESE LOW SPEEDS THE CONVENTIONAL AERODYNAMIC CONTROL SURFACES MAY NOT BE ABLE TO COPE WITH THE FORCES AND MOMENTS PRODUCED BY SYMMETRIC AS WELL AS ASYMMETRIC ENGINE POWER. THIS PROBLEM WAS ALLEVIATED BY INCREASING CONTROL EFFECTIVENESS BY USE OF BLC. FURTHER REDUCTIONS IN THE LANDING AND TAKE-OFF SPEEDS TO OBTAIN SHORTER DISTANCES PROBABLY WILL RESULT IN THE NEED TO SUPPLEMENT THE AERODYNAMIC CONTROLS, THE NEED FOR COUNTERROTATING PROPELLERS, AND POSSIBLY THE NEED FOR INTERCONNECTED SHAFTING ON THE PROPELLERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-263 450
GENERAL ELECTRIC CO CINCINNATI OHIO

RESULTS OF WIND TUNNEL TESTS OF A FULL SCALE FUSELAGE MOUNTED, TIP TURBINE DRIVEN LIFT FAN, VOLUME 2, ADDITIONAL 30 HOURS OF WIND TUNNEL TESTS, SEPTEMBER-DECEMBER 1960 (U)

APR 61 1V
CONTRACT: DA44 177TC584
MONITOR: TRECOM TR-61-15-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, *SHROUDED PROPELLERS, *WIND TUNNELS, ACCELERATION, AERODYNAMIC CHARACTERISTICS, DECELERATION, DRAG, INSTRUMENTATION, LIFT, MEASUREMENT, MODEL TESTS, MOMENTS, PITCH (MATERIAL), PITCH (MOTION), STABILITY, TAILS (AIRCRAFT), TEST EQUIPMENT, TEST FACILITIES, TEST METHODS, TORQUE, WIND TUNNEL MODELS (U)

ANALYSES OF THE RESULTS ARE PRESENTED IN CONSIDERABLE DEPTH DEFINING FAN HOVER PERFORMANCE AND VARIATION WITH FLIGHT SPEED, COMPARING FAN POWERED WITH BASIC AIRCRAFT PERFORMANCE AND CALCULATING VARIOUS TRANSITION PERFORMANCE CHARACTERISTICS AND CONFIGURATION REQUIREMENTS FOR CASES OF MAXIMUM ACCELERATION, MAXIMUM CLIMB, CONTROLLED DESCENT, UNACCELERATED LEVEL FLIGHT AND SHORT TAKE OFF (WITH AND WITHOUT OVERLOADS). (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-263 597
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

THE INFLUENCE OF TWO-DIMENSIONAL STREAM SHEAR ON AIRFOIL MAXIMUM LIFT (U)

AUG 61 1V VIDAL,R.J.;CURTIS,J.T.;HILTON,J.H.;
REPT. NO. AI 1190 A 7
CONTRACT: DA44 177TC439
MONITOR: TRECOM TR-61-93

UNCLASSIFIED REPORT

DESCRIPTORS: *AIRFOILS, *LIFT, *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS, EXPERIMENTAL DATA, FLIGHT SPEEDS, GAS FLOW, JETS, LANDINGS, MATHEMATICAL ANALYSIS, MODEL TESTS, PERTURBATION THEORY, PRESSURE, TAKE-OFF, WINGS (U)

THE EFFECTS OF STRE M V LOCITY GRADIENT ON AIRFOIL MAXIMUM LIFT ARE DEFINED WITH EXPERIMENT L DA A OB AINED IN A SIMULATED TWO-DIMENSIONAL SLIPSTREAM. THE EXPERIME T L RESULTS SHOW THAT W EN PO ITIONED NEAR THE SLIPS REAM PLANE OF SYMMETRY, THE AIRFOIL M XIMUM LIFT VARI S MARKEDLY WITH LOCATION IN THE SLIPSTREAM. IN MOVI G HE IRFOIL FROM ABOV TO BELOW THE SLIPSTREAM PLANE OF SYMMETRY THROUGH A TOTAL DISTANCE CORRESPONDING TO THE AIRFOIL THICKNE S, FORCE DATA AND BOUNDARY-LAY R OBSERVATIONS SHOW THAT BOUNDARY-LAYER SEPARATION IS DELAYED TO HIGHER ANGLE OF A CK, A D THE AIRFOIL MAXIMUM LIFT IS DOUBLED. IT IS CONCLUDED THAT THE DESTALLING EFFECT OB ERVED IN T NONU IFOR LIPSTREAM IS O ASSOCIATED WIT SLIPSTREAM BOU RY INTERFERENC BUT STEMS FROM THE INFLUENCE OF E LARGE LOCAL SLIPSTREAM SHEAR ON AIRFOIL CHARACTERISTICS THE EFFECTS OF UNIFORM NO UNIFORM SHEAR ON AIRFOIL LIFT AND PRES URE DIS RIBUTION ARE DISCUSSED, WITHIN THE FRAMEWORK OF EXISTING F'RST-ORDER, SMALL-SHEAR THEORY, TO SHOW THAT T ESE EFFECTS OF SHEAR TEND TO PROMOTE STALL. A POHLHAUSEN CALCULATION OF TH LAMINARY BOUNDARY LAYER IN A STREAM WITH S AR IS USED TO IDENTIFY AN TO AS ESS THE EFF CTS OF STREAM SHEAR ON BOUNDARY-LAYER SEPARATION CRITERIA. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-266 771
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

GAS TURBINE ENGINES IN SHORT OR VERTICAL TAKE-OFF AND LANDING AIRCRAFT (U)

DEC 61 1V WATTKY,D.!
REPT. NO. MCL 1392

UNCLASSIFIED REPORT

DESCRIPTORS: *GAS TURBINES, AIRPLANE ENGINES, DATA, JET ENGINES, JET PROPULSION, SHORT TAKE-OFF PLANES, TRANSLATIONS, TURBOFAN ENGINES, VERTICAL TAKE-OFF PLANES (U)
IDENTIFIERS: GERMANY (U)

A REVIEW IS GIVEN OF THE EMPLOYMENT POSSIBILITIES OF GAS TURBINE POWER PLANTS IN STOL-, VTOC- AND VTOL-AIRCRAFT. THE DEVELOPMENT OF NEW GAS TURBINE ENGINES FOR VTOL-AIRCRAFT WAS GENERALLY DISCONTINUED WHILE CONVENTIONAL GAS TURBINES ARE MADE SERVICEABLE FOR SPECIAL VTOL PURPOSES OF TAKE OFF, E.G. BY TRAVERSING THE ENGINE, DEFLECTION OF GAS JET! THRUST NOZZLE ROTATION, AND JACKETED FANS. A PRIME REQUIREMENT EXISTS FOR LOW ENGINE MASS/THRUST RATIO EXEMPLIFIED BY THE LIGHT WEIGHT JET TURBINE RB.108 OF THE ROLLSROYCE LTD. MENTION IS MADE OF THE SPECIAL VTOLGAS TURBINE BY BRISTOL-SIDDELEY ENGINES LTD. WHICH IS PROVIDED WITH A TURBOFAN, THE TYPE DESIGNATION OF WHICH IS STILL UNKNOWN. DATA PERTAINING TO GAS TURBINE ENGINES USED IN VTOLAIRCRAFT ARE TABULATED. (AUTHOR) :U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-267 523
WICHITA STATE UNIV KANS SCHOOL OF ENGINEERING

A SUMMARY ANALYSIS OF AN STOL TRANSPORT (U)

AUG 61 IV RAZAK,KENNETHICRAIG,A.J.I

UNCLASSIFIED REPORT

DESCRIPTORS: AERODYNAMIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, ANALYSIS, DEFLECTION, DESIGN, DOWNWASH, DRAG, FLAPS, JET FLAPS, JETS, LIFT, MATHEMATICAL ANALYSIS, MILITARY REQUIREMENTS, MODEL TESTS, MOMENTS, SHORT TAKE-OFF PLANES, THEORY, TOPOLOGY, TRANSPORT PLANES, WIND TUNNEL MODELS, WINGS (U)

THIS REPT. INCLUDES: THE TOPOLOGY OF THE AERODYNAMIC PARAMETERS OF AN AIRPLANE WITH A JET-AUGMENTED FLAP, BY WILLIAM H. WENTZ, JR. THESIS, JUNE 61, 58P. INCL. ILLUS.A PRELIMINARY ANALYSIS HAS BEEN MADE OF AN STOL TRANSPORT OF 35,000 POUNDS GROSS WEIGHT EQUIPPED WITH FEATURES THAT PRODUCE A TOTAL PERFORMANCE NOT HERETOFORE ACHIEVED IN A SINGLE AIRPLANE. THE PRIME GOAL OF THE ANALYSIS WAS TO SECURE AN AIRPLANE IN WHICH A PILOT COULD CONSISTENTLY ACHIEVE LANDINGS SUCH THAT THE LANDING FIELD LENGTH IS THE SAME AS THE BEST PERFORMANCE OF THE AIRPLANE. THE LANDING DISTANCE OF THIS AIRPLANE IS 1170 FEET AND THE TAKE-OFF DISTANCE IS 1380 FEET, BOTH OVER A 50-FOOT OBSTACLE AT ICAO STANDARD SEA LEVEL CONDITIONS. A METHOD OF ANALYSIS IS DESCRIBED WHICH INVOLVES THE USE OF TRAILING EDGE FLAPS DEFLECTED TO 100 DEGREE AND THE USE OF THRUST TO FLARE THE AIRPLANE. THE CONTROL OF THE AIRPLANE L/D RATIO MAKES IT POSSIBLE TO ACHIEVE CONSISTENTLY THE ABOVE LANDING DISTANCES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-269 082
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL AIRCRAFT. PART I - WIND TUNNELS HAVING WIDTH-HEIGHT RATIO OF 2.0 (U)

JAN 62 1V HEYSON,HARRY H.I
REPT. NO. TN D 933

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, *WIND TUNNELS, AERODYNAMIC CHARACTERISTICS, CONFIGURATION, GROUND EFFECT, INTERFERENCE, MATHEMATICAL ANALYSIS, TABLES, WIND TUNNEL MODELS (U)

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL AIRCRAFT ARE PRESENTED FOR WIND TUNNELS HAVING A WIDTH-HEIGHT RATIO OF 2.0. THESE TABLES WERE MACHINE-CALCULATED AND ARE INTENDED FOR USE WITH THE PROCEDURES OF NASA TECHNICAL REPORT R-124. THESE TABLES ARE PRESENTED WITHOUT COMMENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-269 091
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL AIRCRAFT. PART II - WIND TUNNELS HAVING WIDTH-HEIGHT RATIO OF 1.5 (U)

JAN 62 IV HEYSON,HARRY H.
REPT. NO. TN D 934

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, *WIND TUNNELS, AERODYNAMIC CHARACTERISTICS, CONFIGURATION, GROUND EFFECT, INTERFERENCE, MATHEMATICAL ANALYSIS, TABLES, WIND TUNNEL MODELS (U)

DESCRPTORS: (*DOPPLER TRACKNG, ATELITE VEHICES, MATHEMATICL ANALYSIS, ANALYTIC GEOMETRY, EQUA*ONS, MTRIX LGEBA*) (*STELLE VEHICL* TAJECTORIES, MATHEMATIA ANALYSI, SATISICAL ANALYS, LEAST SQUAES METHOD.) (EROR, PROPAGATION, ANALYSIS OF VARIANCE, DETERMINANTS.) IDENTIFIER: POLYDOP. THE MTHEMATICS FOR POLYDOP IS PRESENTED. THE DEVELOPMENT STRT WIYH THE DERIVATION OF THE BASIC MAHEMATCAL RELATIONS. THE CONDITONS NECESSARY FOR THE EXITENCE OF A UNIQUE SOLUION TO THESE EQUAIONS AE DISCSSED, AND THE SOLUTIONS TO A NUMER OF POLYDOP SYSEM EQUONS ARE PRESENTED. THE PROBLEMS THA APPEAR WHEN MORE THAN ONE VEHICLE IS IN THE REGION OF OBSERVATION OF THE SYSTEM AT ANY GIVEN TME ARE DISCUSSED. SITUATIONS ARE CUNSDERED IN WHICH THE SAME DATA MIGHT BE TAKEN EVEN IF THE VEHICLE PANS CORESPONDNG TO THIS DTA ARE NOT THE SAME. THE PROBLEM OF CONVERSION OF RANGE INFORMATION INTO CATESIAN COORDINATE INFORMATION I TREATED. THE TWO MOST COMMON MEASURES OF EROR PROPAGATON AND A METHOD FOR FINDING THE POINT OF INTERECTION OF TWO CONICS ARE INCLUDED. AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M08

AD-269 921
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D C

TABLES OF INTERFERENCE FACTORS FOR USE IN WIND-TUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOL-STOL AIRCRAFT. PART IV - WIND TUNNELS HAVING WIDTH-HEIGHT RATIO OF 0.5 (U)

JAN 62 IV HEYSON,HARRY H.;
REPT. NO. TN D 936

UNCLASSIFIED REPORT

DESCRIPTORS: *INTERFERENCE, *TABLES, *WIND TUNNELS, AERODYNAMIC CONFIGURATIONS, BOUNDARY LAYER, CONFIGURATION, DATA, JETS, LIFT, SHORT TAKE-OFF PLANES, VERTICAL TAKE-OFF PLANES, WIND TUNNEL MODELS (U)

TABLES OF INTERFERENCE FACTORS FOR USE IN WINDTUNNEL AND GROUND-EFFECT CALCULATIONS FOR VTOLSTOL AIRCRAFT ARE PRESENTED FOR WIND TUNN LS HAVING A WIDTH-HEIGHT RATIO OF 0.5. THESE TABLES W RE MACHINE-CALCULATED AND ARE INTENDED FOR USE WITH THE PROCEDURES OF NASA TECHNICAL REPORT R-124 (AD-269 611). (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-270 110
PRINCETON UNIV N J

APPLICATION OF SMALL-SCALE PROPELLER TEST DATA TO V/STOL AIRCRAFT DESIGN (U)

OCT 61 1V PAYNE,HENRY E. III.I

UNCLASSIFIED REPORT

DESCRIPTORS: •MODEL TESTS, •PROPELLER BLADES, •ROTOR BLADES (ROTARY WINGS), •ROTOR BLADES (TURBOMACHINERY), •SHORT TAKE-OFF PLANES, •VERTICAL TAKE-OFF PLANES, AERODYNAMIC CONFIGURATIONS, LABORATORY EQUIPMENT, MATHEMATICAL PREDICTION, RELIABILITY, TEST EQUIPMENT, TEST METHODS, WIND TUNNEL MODELS, WIND TUNNELS (U)

A COMPILATION OF AVAILABLE EXPERIMENTAL AND ANALYTICAL DATA IS PRESENTED, DEALING WITH THE EFFECTS OF PROPELLERS (AND ROTORS) ON V/STOL TAKE-OFF AND TRANSITION FLIGHT. SINCE THE MAJORITY OF THE EXPERIMENTAL WORK WAS CONDUCTED WITH SMALL-SCALE PROPELLERS/ROTORS, CONSIDERABLE EFFORT WAS EXPENDED TO DEMONSTRATE THE APPLICABILITY OF THESE DATA TO FULL-SCALE PROPELLERS. THE DEPENDENCE OF TAKE-OFF PERFORMANCE ON BLADE REYNOLD'S NUMBER AND TIP MACH NUMBER IS DESCRIBED. RECENT RESULTS FROM THE NAVY FLYING WIND TUNNEL HAVE CONCLUSIVELY INDICATED THE DEPENDENCE OF MODEL V/STOL TRANSITION FLIGHT DATA ON THE CHARACTER OF THE MODEL TEST FACILITY. THEREFORE, THE CORRELATION OF MODEL VS. FULLSCALE PROPELLER/ROTOR TRANSITION DATA WAS IMPOSSIBLE BECAUSE OF THE NON-AVAILABILITY OF ACCURATE FULL-SCALE RESULTS. DATA ARE PRESENTED DESCRIBING IDENTICAL TESTS RUN ON THE AIRSHIP AND IN THREE DIFFERENT WIND TUNNELS. A BRIEF ANALYTICAL TREATMENT IS DESCRIBED WHICH MIGHT ENABLE MORE WORK TO PROCEED TO CORRECT FOR WALL INTERFERENCE. IN ADDITION, THE EXPERIMENTAL TECHNIQUES USED TO OBTAIN ACCURATE LOW VELOCITY MEASUREMENTS AND TO OBTAIN VIBRATION-FREE STRAINGAGE TRACES ARE BRIEFLY DESCRIBED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-275 507
CENTER FOR NAVAL ANALYSES WASHINGTON D C OPERATIONS EVALUATION GROUP

STATUS OF V/STOL TECHNOLOGY (U)

APR 62 IV MILLER,R.H.

REPT. NO. IRM15

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, *TRANSPORT PLANES, *VERTICAL TAKE-OFF PLANES, CARRIER LANDINGS, DESIGN, LOGISTICS, MILITARY REQUIREMENTS, NAVAL AIRCRAFT, NAVAL OPERATIONS, OPERATIONS RESEARCH (U)

THE MISSION AND CAPABILITIES OF A TILT-WING VTOL LOGISTIC TRANSPORT, AS REQUIRED BY THE NAVY, ARE DISCUSSED. THE DESIGN PARAMETES NEEDED TO FULFILL THESE REQUIREMENTS AS WELL AS THE CURRENT STATE OF THE ART ARE PRESENTED. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-276 504
NORTH AMERICAN AVIATION INC LOS ANGELES CALIF

LOW SPEED FREE AIR TESTS OF A POWERED .165 SCALE FOUR ENGINE TILT WING V/STOL MODEL (U)

MAR 62 1V
REPT. NO. NA62H 211

UNCLASSIFIED REPORT

DESCRIPTORS: *CONVERTIBLE AIRPLANES, *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS, DRAG, LIFT, MODEL TESTS, MOMENTS, TABLES (U)

LOW SPEED FREE AIR TESTS OF A POWERED .165 SCALE FOUR ENGINE TILT WING V/STOL MODEL.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-276 616
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

FACTORS LIMITING THE LANDING APPROACH SPEED OF
AIRPLANES FROM THE VIEWPOINT OF A PILOT (U)

APR 61 12P INNIS,R.C.;
REPT. NO. 358

UNCLASSIFIED REPORT

DESCRIPTORS: •BOUNDARY LAYER CONTROL, •JET FIGHTERS,
•SHORT TAKE-OFF PLANES, •TRANSIENTS, AILERONS, AIRPLANE
LANDINGS, CONTROL, FLAPS, FLIGHT TESTING, PROPELLERS
(AERIAL), STABILITY, WAKE (U)

AN EXAMINATION WAS MADE FROM THE PILOT'S POINT OF
VIEW OF SOME OF THE FACTORS LIMITING THE LANDING
APPROACH SPEED OF AIRPLANES. THE RESULTS OF TWO
SPECIFIC AIRCRAFT WERE CONSIDERED: ONE A SWEPTWING
JET FIGHTER EMPLOYING BLOWING-TYPE BOUNDARYLAYER
CONTROL (BLC) ON HIGHLY DEFLECTED LEADINGAND
TRAILING-EDGE FLAPS, AND THE OTHER A STRAIGHT-WING,
TWIN-ENGINE CARGO AIRCRAFT USING PROPELLER SLIPSTREAM
IN CONJUNCTION WITH AN AREA SUCTION BLC SYSTEM ON
THE FLAPS AND DROOPED AILERONS TO DEVELOP HIGH LIFT.
AN ATTEMPT IS MADE TO PROVIDE A BETTER
UNDERSTANDING OF THE EFFECT OF VARIOUS STABILITY AND
CONTROL CHARACTERISTICS ON THE PILOT'S SELECTION OF
APPROACH SPEEDS. IT IS SHOWN THAT IN THE PRESENCE
OF POOR HANDLING QUALITIES, THE PILOT DEMANDS AN
EXCESS MARGIN OF SPEED WHICH HE USES TO COMPENSATE
FOR THE ATTENTION REQUIRED BY THE UNDESIRABLE
CHARACTERISTICS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-283 081
BELL AEROSYSTEMS CO BUFFALO N Y

CONTROL CHARACTERISTICS OF V/STOL AIRCRAFT IN TRANSITION (U)

JUL 62 223P HENDERSON,C.;KROLL,J.;HESBY,A.;
REPT. NO. 2023 917002
CONTRACT: NOW-61-0859

UNCLASSIFIED REPORT

DESCRIPTORS: *FLIGHT SIMULATORS, *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, ANALOG SYSTEMS, CONTROL SIMULATORS, CONTROL SYSTEMS, DAMPING, FLIGHT PATHS, FLIGHT SPEEDS, HOVERING, PITCH (MATERIAL), PITCH (MOTION), ROLL, YAW (U)

IDE TIFIERS: OVERING, VTOL CRAFT BELL D-2064, VTOL CRAFT BELL D -§§<.A SIMULATOR STUDY WAS MADE OF THE LONGITUDINAL CONTROL AND FLIGHT HANDLING CHARACTERISTICS OF THREE TYPES OF V/STOL AIRCRAFT DURING THE TRANSITIONAL PHASE OF FLIGHT BET EEN HOVE° AND CO VENTIONAL L VEL FLIGHT. THE AIRCRAFT CONFIGUR TIONS STUDIED WERE IN THE 35,000 POUND WEIGHT CLASS AND OF THE FOLLO ING TYPES: (1) DUAL TANDEM DUCTE PROPELLER, ( ) ILT ROTOR, AND (3) TILT WING WITH DEFLEC D SLIPSTREAM. FLIGHT EVALU TION OF CON ROL POWER AN DAMPING WERE CON UC ED TO DETERMINE PILOT RATING BOUNDARIES FOR EAC CONFIGURATION. OTHER AERODYNAMIC AN CONTROL PARAMETERS INVESTIGATED WERE: (1) SPEED STABILITY PARAMETER, (2) STA IC ABILI Y PARAM TER, (3) CHANGE IN PITCHING MOMENT DUE TO CH NGE IN THRU T, (4) CONVERSION RATE, (5) THROTTLE GRADIENT AND (6) SLOPE OF THE POWER RE UIRED CURVE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-285 079
VEHICLE RESEARCH CORP PASADENA CALIF

DEVELOPMENT OF METHODS FOR PREDICTING V/STOL AIRCRAFT CHARACTERISTICS (U)

DEC 61 IV RETHORST,SCOTT;FUJITA,TOSHIO;
REPT. NO. 12
CONTRACT: NONR309900

UNCLASSIFIED REPORT

DESCRIPTORS: *HELICOPTERS, *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES, AERODYNAMIC CONFIGURATIONS, AIR FORCE OPERATIONS, AIRFRAMES, COMPUTERS, CONVERTIBLE AIRPLANES, DESIGN, FLIGHT PATHS, JET PLANES, LOAD DISTRIBUTION, MATHEMATICAL ANALYSIS, MATHEMATICAL PREDICTION, MILITARY REQUIREMENTS, NOMOGRAPHS, OPERATIONS RESEARCH, TABLES (U)

DESCRIPTORS: *VERTICAL TAKE-OFF PLANES, *SHORT TAKE-OFF PLANES, *HELICOPTERS, MATHEMATICAL ANALYSIS, MATHEMATICAL PREDICTION, CONVERTIBLE AIRPLANES, DESIGN, OPERATIONS RESEARCH, AIR FORCE OPERATIONS, MILITARY REQUIREMENTS, JET PLANES, FLIGHT PATHS, AERODYNAMIC CONFIGURATIONS, AIRFRAMES, LOAD DISTRIBUTION, COMPUTERS, NOMOGRAPHS, TABLES, AERODYNAMICS. THE ANALYSES OF THE PREVIOUS PHASE I (AD-244 736) AND PHASE II (AD-257 571) STUDIES ARE EXTENDED AND REFINED. THE RELATIONSHIPS AMONG BASIC V/STOL PERFORMANCE PARAMETERS ARE BROUGHT INTO FOCUS. RESULTS ARE CAST INTO AN ENGINEERING FORM. A 'SLIDE-RULE' TYPE COMPUTER AND A SET OF NOMOGRAPHS ARE FURNISHED TO SIMPLIFY PREDICTION OF V/STOL AIRCRAFT CHARACTERISTICS. PROPELLERDRIVEN V/STOL AIRCRAFT ARE ANALYZED IN TERMS OF TRADE-OFFS AMONG BASIC PERFORMANCE PARAMETERS FOR A GENERALIZED MISSION PROFILE. THE ATTAINMENT OF HIGH PERFORMANCE POTENTIAL IS DEPENDENT ON THE BASIC AERODYNAMIC PARAMETERS GOVERNING THE FORWARD FLIGHT CAPABILITIES OF CONVENTIONAL AIRCRAFT. FOR V/STOL AIRCRAFT THE VARIABLE DISC AREA PARAMETER (RATIO OF HOVERING DISC AREA TO FORWARD FLIGHT DISC AREA) HAS A MARKED EFFECT ON PERFORMANCE POTENTIAL. THE 'SLIDE-RULE' AND NOMOGRAPHS ENCOMPASS A WIDE RANGE OF BASIC PARAMETERS INCLUDING VARIABLE DISC AREA AND ARE APPLICABLE TO PROP-DRIVEN V/STOL AIRCRAFT.

17

(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOS

AD-289 561
PRINCETON UNIV N J

A PRELIMINARY STUDY OF THE DYNAMIC STABILITY AND CONTROL RESPONSE DESIRED FOR V/STOL AIRCRAFT (U)

JUN 62 IV ELLIS,D.R.;CARTER,G.A.;

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, *VERTICAL TAKE-OFF PLANES; ACCELERATION, AUTOMATIC, AUTOMATIC PILOTS, EQUATIONS, FEEDBACK; FLIGHT PATHS, FLIGHT SIMULATORS, GUSTS, HELICOPTERS, HOVERING, MATHEMATICAL ANALYSIS, MOTION, PITCH (MOTION), SIMULATION, STABILITY, STABILIZATION SYSTEMS, VELOCITY (U)

LONGITUDINAL DYNAMICS AND CONTROL RESPONSE DESIRED FOR VTOL/STOL AIRCRAFT STABILIZED AUTOMATICALLY.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-401 106
BOEING CO NORTON PA VERTOL DIV

RESEARCH PROGRAM TO DETERMINE THE FEASIBILITY AND POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL) CONFIGURATION (U)

DEC 62 198P WAHL,H.;MCHUGH,F.;
REPT. NO. R 276
CONTRACT: DA44 177TC663
MONITOR: TRECOM TR-62-63-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS, AIRPLANE MODELS, ARMY AIRCRAFT, DUCTED FANS, FEASIBILITY STUDIES, GROUND EFFECT, MODEL TESTS (U)

WIND TUNNEL STUDIES TO EVALUATE THE FEASIBILITY AND POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL) CONFIGURATION.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-401 149
BOEING CO MORTON PA VERTOL DIV

RESEARCH PROGRAM TO DETERMINE THE FEASIBILITY AND POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL) CONFIGURATION. VOLUME I (U)

DEC 62 1V
REPT. NO. R276
CONTRACT: DA44 177TC663
MONITOR: TRECOM TR-62-63-VOL-1

UNCLASSIFIED REPORT

DESCRIPTORS: *SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS, AIRPLANE MODELS, ARMY AIRCRAFT, DUCTED FANS, FEASIBILITY STUDIES, GROUND EFFECT, MODEL TESTS (U)

WIND TUNNEL STUDIES TO EVALUATE THE FEASIBILITY AND POTENTIAL OF THE GROUND EFFECT TAKE-OFF AND LANDING (GETOL) CONFIGURATION.

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-421 955
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF

GETOL RESEARCH PROGRAM. (U)

DESCRIPTIVE NOTE: FINAL REPT.
AUG 63 165P
REPT. NO. GDC-62-370
CONTRACT: DA-44-177-TC-722
PROJ: DA-1-D-121401-A-147
TASK: 1-D-121401-A-14701
MONITOR: TRECOM TR-63-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), MODEL TESTS, HOVERING, CONTROL, BASE FLOW, PRESSURE, TAKE-OFF, THRUST VECTOR CONTROL SYSTEMS, PITCH (MOTION), LOAD DISTRIBUTION, SLOTTED FLAPS, ANGLE OF ATTACK, WIND TUNNEL MODELS, GROUND EFFECT MACHINES, DEFLECTION, INLET GUIDE VANES, TAILS (AIRCRAFT), DRAG, LANDINGS, YAW, ROLL, NOZZLES, EXHAUST NOZZLES, GROUND EFFECT (U)
IDENTIFIERS: 1963; GETOL (U)

RESULTS ARE PRESENTED FOR AN EXPERIMENTAL RESEARCH PROGRAM TO DETERMINE THE AERODYNAMIC CHARACTERISTICS OF A GROUND-EFFECT TAKE-OFF AND LANDING (GETOL) AIRCRAFT AND TO ASCERTAIN THE FEASIBILITY AND POTENTIAL OF A GETOL AIRCRAFT SYSTEM. THE OBJECTIVE OF THE GETOL CONCEPT IS TO PRODUCE AN AIRCRAFT THAT WOULD ELIMINATE CONVENTIONAL LANDING GEAR AND PROVIDE A CAPABILITY FOR TAKE-OFF AND LANDING OVER UNPREPARED TERRAIN. THE PROGRAM INCLUDED STATIC-ROOM AND WIND-TUNNEL TESTING. THE DATA AND RESULTS FROM THE TESTS PROVIDED THE BASIS FOR THE DESIGN ANALYSIS AND LAYOUTS OF THE GETOL AIRCRAFT STUDY CONTAINED IN THIS REPORT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-426 130
MISSISSIPPI STATE UNIV STATE COLLEGE

THE MARVEL PROJECT. THE MARVELETTE AIRPLANE BACKGROUND AND DESCRIPTION. (U)

NOV 63 25P
CONTRACT: DA-44-177-AMC-892(T)
PROJ: DA-1-D-121401-A-142
TASK: 1-D-121401-A-14203
MONITOR: TRECOM TR-63-54

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, RESEARCH PLANES); (*RESEARCH PLANES, SHORT TAKE-OFF PLANES), ARMY AIRCRAFT, FEASIBILITY STUDIES, DESIGN, SHROUDED PROPELLERS, TAILS (AIRCRAFT), RING WINGS, FLIGHT TESTING, BOUNDARY LAYER CONTROL SYSTEMS, SUCTION SLOTS (U)
IDENTIFIERS: 1963; MARVELETTE AIRCRAFT, MARVEL PROJECT, AG-14 AIRCRAFT, XAZ-1 AIRCRAFT (U)

A RESEARCH PROJECT CURRENTLY BEING UNDERTAKEN AT MISSISSIPPI STATE UNIVERSITY IS REPORTED IN WHICH AN AERODYNAMIC RESEARCH AIRCRAFT, THE MARVEL, IS BEING DESIGNED TO EXPLORE THE PROBLEM AREAS INHERENT IN STOL FIXED-WING AIRCRAFT. AFTER SEVERAL YEARS OF EXPERIMENTATION WITH MODIFIED OFF-THE-SHELF AIRCRAFT, IT BECAME EVIDENT THAT FULL EVALUATION OF NEW STOL DESING TECHNIQUES WAS SEVERELY LIMITED BY BASIC CONFIGURATIONS OF AVAILABLE AIRCRAFT AND THAT AN AIRCAFT INCORPORATING THE LATEST TECHNIQUES IN ITS BASIC CONFIGURATION SHOULD BE DESIGNED AND TESTED. AS AN INTERIM STEP TOWARD REFINEMENT OF THE MARVEL DESIGN, A TEST BED AIRCRAFT, THE MARVELETTE (XAZ-1), HAS BEEN DESIGNED, BUILT AND FLOWN. THIS REPORT PRESENTS THE BACKGROUND HISTORY OF THE MARVEL AND THE DESCRIPTION OF THE MARVELETTE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-426 377
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT PARIS (FRANCE)

AERODYNAMIC ASPECTS OF BOUNDARY LAYER CONTROL FOR HIGH LIFT AT LOW SPEEDS. (U)

JAN 63 67P WILLIAMS,J. ;BUTLER,S. F. J.

MONITOR: AGARD 414

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AIRCRAFT TAKE-OFF AND LANDING SPECIALISTS' MEETING SPONSORED BY THE AGARD FLIGHT MECHANICS PANEL, 15-18 JAN 63, PARIS.

DESCRIPTORS: (*BOUNDARY LAYER CONTROL SYSTEMS, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, BOUNDARY LAYER CONTROL SYSTEMS), TRAILING CONTROL SURFACES, JET FLAPS, SUCTION SLOTS, AERODYNAMIC CONFIGURATIONS, AIRFOILS, SUPERSONIC AIRFOILS, LIFT, PITCH (MOTION), DRAG, LAMINAR FLOW, FLIGHT TESTING, LANDINGS, TAKE-OFF, PERFORMANCE (ENGINEERING), FLAPS, COANDA EFFECT (U)
IDENTIFIERS: 1963 (U)

THE USEFULNESS OF BOUNDARY-LAYER CONTROL (B.L.C.) AT THE KNEE OF A TRAILING-EDGE FLAP, OVER THE WING NOSE CLOSE TO THE LEADING EDGE OR AT THE KNEE OF A LEADING-EDGE FLAP IS FIRST NOTED. VARIOUS METHODS OF PROVIDING B.L.C. ARE OUTLINED, COMPRISING SLOT BLOWING, SLOT SUCTION, AREA SUCTION, INCLINED AIR-JETS, AND SPECIALLYDESIGNED AEROFOIL SHAPES. THE AERODYNAMIC ASPECTS OF SLOT BLOWING OVER TRAILINE-EDGE FLAPS AND THE WING NOSE ARE THEN EXAMINED IN DETAIL, AND BOTH SLOT SUCTION AND AREA SUCTION ARE ALSO CONSIDERED. THE ASSOCIATED PRATICAL DESIGN FEATURES REQUIRED FOR GOOD PERFORMANCE ARE DISCUSSED AND SOME FLIGHT-HANDLING IMPLICATIONS ARE MENTIONED. (AUTIOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-426 783
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

PERFORMANCE AND OPERATION OF QUASI TWO DIMENSIONAL JET FLAPS, (U)

NOV 63 52P KORBACHER,G.K.;
REPT. NO. REPT. 90
CONTRACT: DA-TC-44-177-G1
PROJ: DA-1-D-121401-A-142
TASK: 1-D-121401-A-14224
MONITOR: TRECOM TR-63-58

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET FLAPS, AERODYNAMIC CONTROL SURFACES), (*SHORT TAKE-OFF PLANES, JET FLAPS), TWO DIMENSIONAL FLOW, RECOVERY, THRUST, LIFT, DRAG, WINGS, OPTIMIZATION, ANGLE OF ATTACK, MATHEMATICAL ANALYSIS, AERODYNAMIC CHARACTERISTICS, FLUID FLOW, EXPERIMENTAL DATA, DEFLECTION, AERODYNAMIC CONFIGURATIONS, DESIGN, THEORY, VELOCITY. (U)
IDENTIFIERS: 1963. (U)

TRUE TWO-DIMENSIONAL AND QUASI TWO-DIMENSIONAL JET-FLAP TEST RESULTS ARE EVALUATED FOR EXPERIMENTAL EVIDENCE IN FAVOR OR AGAINST THE ONCE MUCH-DISPUTED JET-FLAP THRUST HYPOTHESIS. THE THRUST HYPOTHESIS IS VERIFIED EXPERIMENTALLY AS CONCLUSIVELY AS IT HAS BEEN PROVEN THEORETICALLY. THE DEVELOPMENT IS PRESENTED OF JET-FLAP CHARACTERISTICS FOR TRULY AND QUASI TWO-DIMENSIONAL JET-FLAPPED WINGS. FOR ANY DESIRED LIFT, IT RENDERS ANY NUMBER OF COMBINATIONS OF RATE OF BLOWING, JET-DEFLECTION ANGLE, AND ANGLE OF ATTACK WHICH CAN PRODUCE THIS LIFT. BESIDES, IT PERMITS THAT AMOUNT OF THE JET-SHEET THRUST WHICH CAN BE RECOVERED AS PROPULSIVE THRUST OR WHICH IS NULLIFIED BY THE DRAG OF THE JET-FLAPPED WING TO BE READ OFF SIMULTANEOUSLY. THE RATIO OF THESE VALUES REFLECTS ON THE PERFORMANCE AND ECONOMY OF OPERATION OF THIS WING. IF THEN, THE PRODUCTION OF A SPECIFIC LIFT IS OPTIMIZED WITH RESPECT TO THE LOWEST EXPENDITURE IN BLOWING AT THE SMALLEST POSSIBLE DRAG, AN 'OPERATING LINE' CAN BE DEFINED AND ADDED TO THE JET-FLAP 'CHARACTERISTICS'. THE RANGE OF ECONOMICAL JET-FLAP OPERATION WAS FOUND TO COINCIDE WITH THE REGION IN WHICH ANY CHANGE IN THE RATE OF BLOWING RESULTS IN EXACTLY THE SAME CHANGE IN THE MEASURED THRUST. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-430 063
DOUGLAS AIRCRAFT CO INC LONG BEACH CALIF

A STUDY OF ROUGH-TERRAIN-INDUCED STRUCTURAL LANDING LOADS. (U)

DEC 63 181P
CONTRACT: DA-44-177-TC-735
PROJ: DA-1-D-121401-A-146
TASK: 1-D-121401-A-14602
MONITOR: TRECOM TR-63-68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•AIRPLANE LANDINGS, LOADING (MECHANICS)), (•SHORT TAKE-OFF PLANES, AIRPLANE LANDINGS), STRUCTURES, WEIGHT, TERRAIN, LANDING GEAR, LANDING IMPACT (U)
IDENTIFIERS: 1963, V-1 AIRCRAFT (U)

AN INVESTIGATION WAS MADE OF THE EFFECT OF ROUGH TERRAIN ON THE LOADS, WEIGHTS, AND PERFORMANCE OF THE OV-1 AIRPLANE DURING LANDINGS. THE LOAD CALCULATIONS, WHICH WERE CONDUCTED ON AN IBM 7090 COMPUTER, CONSIDERED THE INTERNAL OPERATING MECHANISM OF THE LANDING GEAR AND THE FLEXIBILITIES OF THE GEAR AND STRUCTURE AS A MUTUALLY INTERACTING DYNAMIC SYSTEM. THE EQUATIONS OF MOTION AND CERTAIN DETAILS OF THE COMPUTER PROGRAM ARE PROVIDED. A DETERMINATION WAS MADE OF THE TERRAIN ROUGHNESS AT WHICH MODIFICATION TO THE AIRPLANE WAS CONSIDERED NECESSARY AND THE TERRAIN ROUGHNESS AT WHICH THE REDUCED PERFORMANCE OF THE OV-1 AIRPLANE, DUE TO INCREASED WEIGHT, BECAME EQUAL TO OR INFERIOR TO A VTOL AIRCRAFT OF EQUAL WEIGHT. THIS WORK WAS CONCERNED WITH THE DETERMINATION OF MAXIMUM LOADS AND CORRESPONDING WEIGHT AND PERFORMANCE PENALTIES; HOWEVER, OBSERVATIONS WERE MADE REGARDANG THE IMPORTANCE OF REPEATED LOADS DURING LANDING OR TAXIING ON SURFACES WITH MULTIPLE IRREGULARITIES. THE PRIMARY RESULTS OF THE INVESTIGATION SHOW THE TERRAIN ROUGHNESS AT WHICH STRUCTURAL REINFORCEMENT IS CONSIDERED NECESSARY AND THE TERRAIN ROUGHNESS AT WHICH THE PERFORMANCE OF THE AIRPLANE BECOMES EQUAL TO THAT OF A VTOL AIRCRAFT OF THE SAME WEIGHT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-452 582
ARMY AIRBORNE ELECTRONICS AND SPECIAL WARFARE BOARD FORT BRAGG N C

INTEGRATED ENGINEERING/SERVICE TEST OF LOW LEVEL EXTRACTION TECHNIQUES (LOLEX) FROM CV-2B AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.
SEP 64 1V
REPT. NO. AB5563
PROJ: USATECOM4 4 7475

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•AIR DROP OPERATIONS, LOW ALTITUDE), (•SHORT TAKE-OFF PLANES, AIR DROP OPERATIONS), RELEASE MECHANISMS, FLIGHT TESTING, AVIATION SAFETY, RELIABILITY, PERFORMANCE (ENGINEERING), PARACHUTES (U)
IDENTIFIERS: V-2 AIRCRAFT, EXTRACTION (U)

THIS REPORT OF TEST INCLUDES RESULTS OF FLIGHT SAFETY, ENGINEER, AND SERVICE TEST OF LOW LEVEL EXTRACTION TECHNIQUES (LOLEX) FOR AIR DELIVERY OF ARMY SUPPLIES AND EQUIPMENT FROM CV-2B AIRCRAFT. TESTS NR 1 AND 4 - 9 WERE THE SERVICE TEST PHASE OF THE TEST CONDUCTED BY THE USAAESW BOARD, EXECUTIVE TEST AGENCY, UNDER FIELD CONDITIONS AT FORT BRAGG, NORTH CAROLINA, DURING THE PERIOD 26 MAY TO 26 JUNE 1964. TEST NR 2 WAS THE FLIGHT ENGINEER TEST PHASE CONDUCTED BY USAATA, SUPPORTING TEST AGENCY, AT EDWARDS AFB, CALIFORNIA, DURING THE PERIOD 10 MARCH TO 3 APRIL 1964. TEST NR 3 WAS THE ENGINEER TEST PHASE CONDUCTED BY YPG, SUPPORTING TEST AGENCY, AT YUMA, ARIZONA, DURING THE PERIOD 6 - 29 APRIL 1964. THE USAAVNTB, SUPPORTING TEST AGENCY, WITH PRIMARY INTEREST IN AIRCRAFT OPERATIONS AND CREW PROCEDURES, PARTICIPATED IN ALL TESTS. THE USAQMS (ABN), WITH PRIMARY INTEREST IN PUBLICATION OF TECHNIQUES AND PROCEDURES, OBSERVED ALL SERVICE TESTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-457 142
LING-TEMCO-VOUGHT INC DALLAS TEX

FEASIBILITY STUDY, XC-142A MODIFIED FOR OPEN OCEAN OPERATION, (U)

FEB 65 188P MARSH,K. R. ;
REPT. NO. 2-55400/4R-963
CONTRACT: NOW-64-0500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, SEAPLANES), (*VERTICAL TAKE-OFF PLANES, SEAPLANES), (*SEAPLANES, TRANSPORT PLANES), FEASIBILITY STUDIES, SEAPLANE FLOATS, INFLATABLE STRUCTURES, ANTISUBMARINE AIRCRAFT, OCEANS, OPERATION, AIRPLANE LANDINGS, LOADING (MECHANICS), IMPACT SHOCK, LANDING GEAR, STRUCTURES, AIRFRAMES, TEST WINGS, FUSELAGES, HULLS (MARINE), HYDRODYNAMICS, AERODYNAMIC CONFIGURATIONS, WEIGHT, DESIGN, DATA, GRAPHICS (U)
IDENTIFIERS: C-142 AIRCRAFT, V-464 AIRCRAFT, GRAPHS (U)

A STUDY HAS BEEN PERFORMED TO DETERMINE THE FEASIBILITY OF DEVELOPING A SEAPLANE VERSION OF THE MODEL XC-142A AIRPLANE. A STOL SEAPLANE VERSION AND VTOL SEAPLANE VERSION OF THE MODEL XC-142A AIRPLANE, BOTH FITTED WITH INFLATABLE VERTICAL FLOATS, WERE STUDIED, AND THE FEASIBILITY OF DEVELOPING BOTH OF THESE AIRPLANES WAS ESTABLISHED. AS A RESULT OF THIS FEASIBILITY STUDY, IT IS RECOMMENDED THAT FURTHER ENGINEERING WORK BE DONE TO ESTABLISH THE VALIDITY OF THE ASSUMPTIONS USED IN THIS STUDY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-482 115 1/3 20/4
WASHINGTON UNIV SEATTLE

THE STUDY OF OPERATIONAL PROBLEMS AND TECHNIQUES IN WIND TUNNEL TESTING OF VTOL AND STOL VEHICLES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 4, 31 MAR-1 OCT 65,
OCT 65 4P RAE,WILLIAM H. ,JR.;
CONTRACT: DA-ARO(D)-31-124-G481
PROJ: 4506-E

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), DUCTED FANS, ROTOR BLADES(ROTARY WINGS), SIMULATION, WALLS, PERFORMANCE(ENGINEERING), TILT WINGS, AERODYNAMIC CONFIGURATIONS, AIRPLANE MODELS, MODEL TESTS, WIND TUNNEL MODELS, TEST METHODS, WIND TUNNELS, GAS FLOW, BOUNDARY LAYER (U)

THE PRIMARY PURPOSE OF THIS INVESTIGATION IS TO DEVELOP AN ECONOMICAL METHOD OF EXPERIMENTALLY CHECKING THE EFFECT OF WIND TUNNEL WALL CONSTRAINTS ON ROTORS, DUCTED FANS, TILT PROPS, AND OTHER METHODS OF OBTAINING AIRCRAFT WITH V/STOL PERFORMANCE, BY THE USE OF INSERTS WITHIN A WIND TUNNEL TO SIMULATE DIFFERENT SIZE TEST SECTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-600 500
FULTON (ROBERT E) JR NEWTON CONN

FULTON AIR-TO-GROUND PICKUP SYSTEM FOR CARIBOU AIRCRAFT. (U)

FEB 64 52P
CONTRACT: DA44 177TC804
TASK: 1D141812XXX02
MONITOR: TRECOM TR64 17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•AERIAL PICKUP SYSTEMS, FLIGHT TESTING), (•SHORT TAKE-OFF PLANES, AERIAL PICKUP SYSTEMS), AIRCRAFT EQUIPMENT, AIR-SEA RESCUES, BALLOONS (U)

THE REPORT CONTAINS OBSERVATIONS, RECOMMENDATIONS, AND CONCLUSIONS REGARDING THE JOINT ENGINEER-USER TESTS OF THE FULTON AIR-TO-GROUND PICKUP SYSTEM. ALSO INCLUDED ARE THE HISTORICAL BACKGROUND OF THE SYSTEM, THE PRINCIPLE OF OPERATION, AND A DESCRIPTION OF THE EQUIPMENT EMPLOYED. THE TEST SERIES WAS SATISFACTORILY COMPLETED AND JUSTIFIES CONCLUDING THE RECOVERY SYSTEM IS SAFE, RELIABLE, AND READY FOR USE WITH THE CARIBOU AIRCRAFT TO RECOVER PERSONNEL AND EQUIPMENT FROM LAND AND FROM WATER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-601 051
UNITED AIRCRAFT CORP STRATFORD CONN SIKORSKY AIRCRAFT DIV

STRUCTURAL DYNAMIC RESPONSE OF LARGE LOGISTIC V/STOL VEHICLES. (U)

DESCRIPTIVE NOTE: TECHNICAL DOCUMENTARY REPT., JUN 62-FEB 64,
APR 64 203P RICH,M. J. ;JEPSON,W. D. ; BUFFALANO,A. C. ;STEBBINS,R. F. ;
CONTRACT: AF 33(657)-8452
PROJ: AF-1370
TASK: 137008
MONITOR: AFFDL TDR-64-44

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, LOADING (MECHANICS)), (*SHORT TAKE-OFF PLANES, LOADING (MECHANICS)), AERODYNAMIC CHARACTERISTICS, AERODYNAMIC CONFIGURATIONS, MATHEMATICAL ANALYSIS, STRUCTURAL PROPERTIES, DESIGN, AERODYNAMIC LOADING, GUST LOADS, TAKE-OFF, LANDING IMPACT, MANEUVERABILITY, WEIGHT, TRANSPORT PLANES, VIBRATION (U)

PRELIMINARY DESIGNS ARE EVOLVED FOR FIVE LARGE LOGISTIC V/STOL CONFIGURATIONS. STRUCTURAL ELASTIC CHARACTERISTICS AND MASS DISTRIBUTIONS ARE CALCULATED. THE STRUCTURAL DYNAMIC RESPONSE IS INVESTIGATED FOR GROUND LANDING, TAKE-OFF ABORT, MANEUVERS, GUST PENETRATION AND LANDING CONDITIONS. THE RESULTS OF THIS INVESTIGATION ARE TABULATED IN A MATRIX SHOWING THE DEGREE AND RELATIVE CRITICALNESS FOR THE CONDITIONS AND THE V/STOL CONFIGURATIONS. THE DEGREE OF CRITICALNESS IS ESTABLISHED AS THE RATIO OF THE PEAK DYNAMIC LOADING AND/OR STRESS TO THE VALUES USED IN THE CONFIGURATION DESIGN STRUCTURAL STUDY. THE LATTER STRUCTURAL LOADS AND/OR STRESSES ARE EVOLVED THROUGH THE USE OF EXISTING MILITARY SPECIFICATIONS OR NORMAL DESIGN PRACTICES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-603 375
BUREAU OF NAVAL WEAPONS HYDROBALLISTICS ADVISORY COMMITTEE
WASHINGTON DC

ESTIMATION OF STOL A/C TAKE-OFF DISTANCES. (U)

DESCRIPTIVE NOTE: WEAPONS SYSTEMS ANALYSIS DIV.
REPT.,
AUG 64 22P THIBAULT,E. A. I
MONITOR: NAVWEPS , RS 64 17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•TAKE-OFF, MATHEMATICAL PREDICTION), (•SHORT TAKE-OFF PLANES, TAKE-OFF), ROLL, DATA, CORRELATION TECHNIQUES (U)

THE STUDY WAS UNDERTAKEN TO FIND AN EASY-TO-USE TAKE-OFF DISTANCE PREDICTION METHOD AND TO EVALUATE ITS APPLICABILITY TO STOL AIRCRAFT. FOR THE PURPOSES OF THE STUDY STOL AIRCRAFT WERE DEFINED AS THOSE REQUIRING A TAKE-OFF GROUND ROLL OF LESS THAN 1000 FT. TWO EXISTING TAKE-OFF GROUND ROLL ESTIMATE METHODS WERE EVALUATED BY COMPARING PREDICTED VALUES WITH AVAILABLE DATA FOR SEVERAL STOL AIRCRAFT. THE RESULTING ACCURACIES WERE RESPECTIVELY WITHIN 9% AND 11% ERROR. IT WAS FOUND THAT ONE OF THESE METHODS COULD BE FURTHER SIMPLIFIED AND YET STILL YIELD ACCEPTABLE RESULTS. THAT IS, EXCLUDING TWO PREDICTIONS THIS SIMPLIFIED METHOD YIELDED AN ACCURACY WITHIN 13% ERROR. IN ADDITION, SOME CORRELATION WAS FOUND TO EXIST BETWEEN SHORT TAKE-OFF GROUND ROLL AND TOTAL DISTANCE OVER A 50 FT OBSTACLE. AS A RESULT AN EXPRESSION WAS DERIVED RELATING THE TWO. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-608 186
DYNASCIENCES CORP FORT WASHINGTON PA

EFFECTS OF PROPELLER SLIPSTREAM ON V/STOL AIRCRAFT PERFORMANCE AND STABILITY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. FOR 24 APR 63-24 MAR 64,
AUG 64 129P GOLAND,L. ;MILLER,N. ;BUTLER, L. ;
REPT. NO. DCR-137
CONTRACT: DA44 177AMC48T
TASK: 1D121401A14203
MONITOR: TRECOM , TR64 47

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, PERFORMANCE (ENGINEERING)), (*VERTICAL TAKE-OFF PLANES, PERFORMANCE (ENGINEERING)), (*PROPELLERS (AERIAL), AERODYNAMIC CHARACTERISTICS), (*WINGS, AERODYNAMIC CHARACTERISTICS), AERODYNAMIC LOADING, AERODYNAMIC CONFIGURATIONS, TAKE-OFF, LANDINGS, CONTROL, STABILITY, MATHEMATICAL ANALYSIS, LIFT, DRAG, DELTA WINGS, FLIGHT, THEORY, STALLING (U)
IDENTIFIERS: SLIPSTREAM (U)

PRESENTED IS AN ANALYTICAL INVESTIGATION OF THE AERODYNAMIC FORCES ACTING ON WING-PROPELLER COMBINATIONS INCLUDING THE EFFECTS OF PROPELLER SLIPSTREAMS. THE RESULTS OF THE DEVELOPED THEORY ARE THEN APPLIED TO TYPICAL TWO- AND FOUR-PROPELLER VTOL AND STOL WING CONFIGURATIONS. CORRELATION WITH EXISTING TEST DATA IS SHOWN TO BE SATISFACTORY. CONSIDERATION IS ALSO GIVEN TO SUCH ASSOCIATED ITEMS AS THE EFFECTS OF THE SLIPSTREAM ON (1) WING STALL (2) AIRCRAFT TAKE-OFF AND LANDING PERFORMANCE AND (3) AIRCRAFT STABILITY AND CONTROL. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-608 515
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

PERFORMANCE, OPERATION, AND USE OF LOWASPECT-RATIO JET-FLAPPED WINGS. (U)

AUG 64 44P KORBACHER,G. K. I
REPT. NO. UTIAS-97
CONTRACT: DA 44 177 AMC 63 G9
TASK: 1D12:401A:4203
MONITOR: TRECOM . TR64 38

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*WINGS, JET FLAPS), (*JET FLAPS, OPERATION), (*SHORT TAKE-OFF PLANES, WINGS), ASPECT RATIO, MATHEMATICAL ANALYSIS, PROPULSION, DRAG, LIFT, PERFORMANCE (ENGINEERING) (U)

THE CHARACTERISTICS OF A JET-FLAPPED WING OF ASPECT RATIO 6 ARE PRESENTED, DISCUSSED, AND EVALUATED FOR STOL APPLICATION. AGAIN, AS FOR HIGH-ASPECT-RATIO (AR = 20) JET-FLAPPED WINGS, A RANGE FOR THE MOST ECONOMICAL JETFLAP OPERATION IS WELL DEFINED. THE ANGLE OF ATTACK AS AN EFFICIENT MEANS OF LIFT PRODUCTION LOSES ITS USEFULNESS WITH LOW-ASPECT-RATIO JET-FLAPPED WINGS, WHEREAS THE OPTIMUM JET-DEFLECTION ANGLE SEEMS HARDLY AFFECTED. A MOST EFFICIENT JET-FLAP APPLICATION FOR STOL CALLS FOR A COMPLETE INTEGRATION OF THE LIFTING AND PROPULSIVE SYSTEMS. IN THE RANGE OF MOST ECONOMICAL JET-FLAP OPERATION, SEMIEMPIRICAL RELATIONSHIPS PREDICT PARAMETER CHANGES ACCURATELY ENOUGH FOR PRACTICAL PURPOSES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-612 906
PRINCETON UNIV N J DEPT OF AEROSPACE AND MECHANICAL SCIENCES

PRELIMINARY DESIGN CONSIDERATIONS FOR A V/STOL WIND TUNNEL. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 JUL 63-31 [illegible] 4.
JAN 65 40P KNOWLTON,MARCUS P. I
CONTRACT: AF33 657 12174
PROJ: 8219
TASK: 821907
MONITOR: AFFDL TDR-64-146

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*WIND TUNNELS, DESIGN), AIRPLANE MODELS, VERTICAL TAKE-OFF PLANES, SHORT TAKE-OFF PLANES, POWER, COSTS, COOLING, HONEYCOMB CORES (U)

THE REPORT DESCRIBES A TANDEM TEST SECTION LOW SPEED WIND TUNNEL AND THE ATTRIBUTES AND DESIGN CONSIDERATIONS OF USING EITHER AN OPEN RETURN OR CLOSED RETURN. POWER AND COST ESTIMATES ARE MADE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-613 523
LEAR SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV

STATE OF THE ART FOR V/STOL CONTROL DISPLAY. (U)

DESCRIPTIVE NOTE: INTERIM REPT.
OCT 63 65P
REPT. NO. GRR-1445
CONTRACT: AF33 657 11740
PROJ: 6190
TASK: 619005
MONITOR: RTD , TDR63-4167

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, REVIEWS), (*SHORT TAKE-OFF PLANES, REVIEWS), DISPLAY SYSTEMS, CONTROL SYSTEMS, PROPULSION, FEASIBILITY STUDIES, AERODYNAMIC CHARACTERISTICS, SIMULATION, AIRCRAFT ENGINES, INSTRUMENTATION, HOVERING, FLIGHT TESTING (U)

A SURVEY WAS CONDUCTED TO ESTABLISH THE 'STATE-OF-THEART' IN V/STOL CONTROL-DISPLAY DEVELOPMENT AND APPLICATION. VISITATIONS WERE MADE TO FIFTEEN UNITED STATES FIRMS AND GOVERNMENT AGENCIES ACTIVELY ENGAGED IN V/STOL DEVELOPMENT AND DATA CORRELATED WITH REPORTED EUROPEAN V/STOL DEVELOPMENT. MOST RESEARCH ACTIVITY TO DATE HAS BEEN CONCERNED WITH PROPULSION FEASIBILITY AND AIRCRAFT AERODYNAMIC CHARACTERISTICS WITH LITTLE EMPHASIS ON CONTROL-DISPLAY SUB-SYSTEMS ANALYSIS. SOME V/STOL SIMULATION HAS BEEN CONDUCTED, PRIMARILY IN THE AREAS OF ALTITUDE CONTROL DURING THE HOVER PHASE. AREAS REQUIRING INTENSIVE CONTROL-DISPLAY ANALYSIS TO FULLY UTILIZE THE UNIQUE V/STOL CAPABILITIES INCLUDE: ENGINE INSTRUMENTATION, LOW AIR SPEED SENSING AND DISPLAY, WING STALL CONDITION AND ANGLE OF ATTACK DURING TRANSITION PHASES, VISIBILITY REQUIREMENTS, AND TERMINAL GUIDANCE REQUIREMENTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-614 585
MCDONNELL AIRCRAFT CORP ST LOUIS MO

STOL-V/STOL CITY CENTER TRANSPORT AIRCRAFT STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT.
OCT 64 174P
REPT. NO. B-122
CONTRACT: FA64WA5012
MONITOR: FAA-ADS , 26

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*AIR TRAFFIC, ANALYSIS), (*CIVIL AVIATION, ECONOMICS), (*VERTICAL TAKE-OFF PLANES, CIVIL AVIATION), (*SHORT TAKE-OFF PLANES, CIVIL AVIATION), (*TRANSPORT PLANES, FEASIBILITY STUDIES), COSTS, URBAN AREAS, ELECTRONIC EQUIPMENT, DESIGN, AIRPORTS, FACTOR ANALYSIS, AIRCRAFT ENGINES, STATISTICAL DATA (U)

THIS IS PART OF A STUDY TO INVESTIGATE THE ECONOMIC FEASIBILITY OF STOL AND V/STOL TRANSPORT AIRCRAFT OPERATION FROM CITY CENTER TO CITY CENTER. A COMPARISON IS MADE OF DESIGN, PERFORMANCE, AND DIRECT OPERATING COSTS OF TWO V STOL AND TWO STOL TRANSPORT AIRCRAFT TO BE OPERATIONAL IN 1975. THE V/STOL AIRCRAFT IN THE STUDY ARE A TILT WING-PROPELLER TYPE AND A TURBOFAN LIFT ENGINE TYPE. THE STOL AIRCRAFT ARE THE PROPELLER DEFLECTED SLIPSTREAM TYPE AND A STOL VERSION OF THE TILT WING-PROPELLER TYPE. PROPULSION SYSTEMS ARE PROJECTED TO A TECHNOLOGICAL LEVEL THAT COULD BE EMPLOYED IN AN AIRCRAFT DESIGN INITIATED IN 1970. MICROMINIATURIZATION OF ELECTRONIC EQUIPMENT IS INCORPORATED TO THE DEGREE THAT IS CONSIDERED ACCEPTABLE OPERATIONALLY AND COST-WISE BY 1975. ALL AIRCRAFT ARE DESIGNED FOR A STAGE LENGTH OF 500 STATUTE MILES, AND PERFORMANCE AND DIRECT OPERATING COSTS ARE SHOWN FOR STAGE LENGTHS OF 50 TO 750 MILES AND FOR AIRCRAFT GROSS WEIGHTS OF 40,000 TO 100,000 POUNDS. TYPICAL THREE-VIEWS ARE SHOWN FOR ONE SIZE OF EACH OF THE FOUR AIRCRAFT. THE RESULTS OF THE PARAMETRIC SIZING STUDY OF EACH AIRCRAFT ARE SHOWN AS GROUP WEIGHT BREAKDOWNS, MISSION PERFORMANCE, DIMENSIONAL TABULATIONS AND CURVES, NOISE LEVEL PROFILES, AND TAKE-OFF AND LANDING CHARACTERISTICS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-614 598
STANFORD RESEARCH INST MENLO PARK CALIF

AN ECONOMIC ANALYSIS OF COMMERCIAL VTOL AND STOL TRANSPORT AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 65 236P WALDO,RICHARD K. ;TILTON, PETER D. ;
CONTRACT: FA64WA4997
PROJ: ISU4922
MONITOR: FAA-ADS , 25

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC SALE.

DESCRIPTORS: (*TRANSPORT PLANES, FEASIBILITY STUDIES), (*CIVIL AVIATION, ECONOMICS), (*AIR TRAFFIC, ANALYSIS), (*VERTICAL TAKE-OFF PLANES, CIVIL AVIATION), (*SHORT TAKE-OFF PLANES, CIVIL AVIATION), AIR TRAFFIC CONTROL SYSTEMS, AIRPORTS, FACTOR ANALYSIS, URBAN AREAS, STATISTICAL DATA, COSTS, DESIGN (U)

ON THE BASIS OF THE RESEARCH UNDERTAKEN IN THE PRELIMINARY STUDY, IT WOULD APPEAR THAT THE PROVISION OF CITYCENTER V/STOL SERVICE WOULD REPRESENT A SOMEWHAT MARGINAL UNDERTAKING FROM THE STANDPOINT OF BOTH THE AIR CARRIER AND THE AIRCRAFT MANUFACTURING INDUSTRIES. THE TRAFFIC POTENTIAL FOR INTERCITY V/STOL SERVICES AND, ACCORDINGLY, THE MARKET POTENTIAL FOR COMMERCIAL V/STOL AIRCRAFT WOULD BE QUITE LIMITED. INDEED, THE SIZE INDICATED FOR THIS AIRCRAFT MARKET SUGGESTS THAT COMMERCIAL V/STOL DEVELOPMENT WOULD BE ATTRACTIVE ONLY AS A FOLLOW-ON TO A MILITARY PROGRAM. THIS OUTLOOK COULD BE CHANGED THROUGH SIGNIFICANT ADVANCES IN THE STATE OF THE ART THAT WOULD PERMIT REDUCTIONS IN DIRECT OPERATING COSTS AND THROUGH THE AVAILABILITY OF SIGNIFICANT FOREIGN MARKETS FOR V/STOL AIRCRAFT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-614 616
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

CHARACTERISTICS OF A RECTANGULAR WING WITH A PERIPHERAL JET IN GROUND EFFECT, PART III. (U)

AUG 64 80P SURRY,D. I

REPT. NO. UTIAS-TN-77
CONTRACT: AF33 657 8451

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY DEFENCE RESEARCH BOARD, OTTAWA, AND NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA. SEE ALSO AD-290 393.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, GROUND EFFECT MACHINES), (*GROUND EFFECT MACHINES, SHORT TAKE-OFF PLANES), (*WINGS, GROUND EFFECT), JETS, WIND TUNNEL MODELS, MODELS TESTS, LIFT, DRAG, PITCH (MOTION), TAKEOFF, LANDINGS, FLAPS, COANDA EFFECT, ANGLE OF ATTACK, VELOCITY, AERODYNAMIC CONFIGURATIONS, AERODYNAMICS, THRUST, STABILITY, MATHEMATICAL ANALYSIS (U)

LIFT, DRAG, AND PITCHING MOMENT WERE MEASURED ON A RECTANGULAR WING WITH A PERIPHERAL JET IN GROUND EFFECT FOR THREE ANGLES OF ATTACK, THREE HEIGHTS ABOVE GROUND, AND FOR A RANGE OF FORWARD SPEEDS NECESSARY FOR TAKE-OFF CALCULATIONS. FURTHERMORE, NINE CONFIGURATIONS WERE TESTED IN THIS FASHION - EACH WITH DIFFERENT JET ANGLES AND DIFFERENT RATIOS OF L.E. TO T.E. JET STRENGTHS. WHEREEVER POSSIBLE, PROCEDURES WERE AUTOMATED AND ON-LINE DATA REDUCTION WAS USED. SOME FLOW VISUALIZATION TESTS WERE MADE ON SPECIFIC CONFIGURATIONS. THE RESULTS WERE USED TO STUDY AN INTEGRATED LIFT AND PROPULSION SYSTEM FOR AIR-CUSHION TAKE-OFF AND LANDING. THESE CALCULATIONS SHOWED LITTLE ADVANTAGE TO BE GAINED FROM USING VARIABLE JET STRENGTHS AND ANGLES DURING TAKE-OFF AT CONSTANT HEIGHT WHEN COMPARED TO FIXED CONFIGURATION RESULTS. THE LATTER USED ANGLE OF ATTACK, OR DIVERSION OF THRUST FROM THE CUSHION TO DIRECT FORWARD THRUST AS MEANS FOR KEEPING THE HEIGHT CONSTANT. A SIMPLE TAKE-OFF PROCEDURE IN WHICH THE HEIGHT IS ALLOWED TO INCREASE NATURALLY, LED TO SLIGHTLY POORER RESULTS, BUT ALL THE TAKEOFF PROCEDURES STUDIED PROVIDED SHORT-FIELD PERFORMANCE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-615 452
MELPAR INC FALLS CHURCH VA

SIMULATION OF HELICOPTER AND V/STOL AIRCRAFT. VOLUME V. SUMMARY OF FINAL RESULTS. (U)

DESCRIPTIVE NOTE: SUMMARY REPT. FOR SEP 63-DEC 64,
DEC 64 17P FAITH,RUTH L. ;
CONTRACT: N61339 1205
MONITOR: NAVTRADEVCEN , 1205-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC SALE. SEE ALSO AD-611 412.

DESCRIPTORS: (•HELICOPTERS, SIMULATION), (•HELICOPTER ROTORS, SIMULATION), (•VERTICAL TAKE-OFF PLANES, SIMULATION), (•SHORT TAKE-OFF PLANES, SIMULATION), MOTION, FLIGHT SIMULATORS, PROGRAMMING (COMPUTERS), MATHEMATICAL MODELS, ANALOG COMPUTERS, TILT WINGS, AIRPLANE LANDINGS, TRAINING DEVICES, NAVAL TRAINING, AERODYNAMIC CHARACTERISTICS, DIFFERNTIAL EQUATIONS (U)
IDENTIFIERS: V/STOL AIRCRAFT (U)

SUMMARY OF THE RESULTS, CONCLUSIONS, AND RECOMMENDATIONS WHICH WERE DERIVED FROM A STUDY PROGRAM DESIGNED TO DEVELOP THE EQUATIONS OF MOTION OF HELICOPTER AND V/STOL AIRCRAFT IN A FORM SUITABLE FOR SIMULATION USING EITHER AN ANALOG OR A DIGITAL COMPUTER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-617 748
ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

SUGGESTED REQUIREMENTS FOR V/STOL FLYING QUALITIES. (U)

DESCRIPTIVE NOTE: RESEARCH TECHNICAL MEMO. NO. 37, JUN 65 55P CURRY,PAUL R. ;MATTHEWS, JAMES T. ,JR.;
REPT. NO. USAAVLABS-TR-65-45

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), (*VERTICAL TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), FLIGHT, SPECIFICATIONS, AERODYNAMIC CHARACTERISTICS, MILITARY REQUIREMENTS (U)

THIS RESEARCH TECHNICAL MEMORANDUM PRESENTS SUGGESTIONS FOR A SPECIFICATION ON FLYING AND HANDLING QUALITIES REQUIREMENTS FOR SUBSONIC V/STOL AIRCRAFT. IN ADDITION TO INCLUDING THE IDEAS OF MANY OTHERS, THE AUTHORS HAVE INCORPORATED TWO BASIC SUGGESTIONS: (1) THE USE OF A PILOT RATING SYSTEM (SINCE THE ULTIMATE MEASURES OF HANDLING QUALITIES ARE DETERMINED BY THE PILOT) AND (2) THE USE OF SERVO-ANALYSIS TECHNIQUES AND TERMS TO DEFINE QUANTITATIVE REQUIREMENTS. THERE ARE NO STATISTICAL OR QUANTITATIVE DATA AVAILABLE TO VERIFY THE STATED REQUIREMENTS IN SOME CASES; HOWEVER, THE REQUIREMENTS ARE BASED ON MANY DIFFERENT V/STOL RESEARCH AIRCRAFT FUNDED BY THE U. S. ARMY AND FLOWN BY U. S. ARMY PILOTS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-619 538
WASHINGTON UNIV SEATTLE

THE STUDY OF OPERATIONAL PROBLEMS AND TECHNIQUES IN WIND TUNNEL TESTING OF VTOL AND STOL VEHICLES. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 3, 1 OCT 64-31 MAR 65,
MAR 65 3P RAE,WILLIAM H. ,JR.;
CONTRACT: DA ARO(D)31 124G481

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*WIND TUNNELS, EFFECTIVENESS), (*VERTICAL TAKE-OFF PLANES, TESTS), (*SHORT TAKE-OFF PLANES, TESTS), TEST METHODS, OPERATION, ROTARY WINGS, DUCTED FANS (U)

THE PRIMARY PURPOSE OF THIS INVESTIGATION IS TO DEVELOP AN ECONOMICAL METHOD OF EXPERIMENTALLY CHECKING THE EFFECT OF WIND TUNNEL WALL CONSTRAINTS ON ROTORS, DUCTED FANS, TILT PROPS, AND OTHER METHODS OF OBTAINING AIRCRAFT WITH V/STOL PERFORMANCE, BY THE USE OF INSERTS WITHIN A WIND TUNNEL TO SIMULATE DIFFERENT SIZE TEST SECTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-623 158
WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF

BASIC MECHANISMS OF NOISE GENERATION BY HELICOPTERS, V/STOL AIRCRAFT, AND GROUND EFFECT MACHINES. (U)

MAY 65 39P LOWSON,M. V. ;
REPT. NO. WR-65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*NOISE, AIRCRAFT), (*HELICOPTERS, NOISE), (*SHORT TAKE-OFF PLANES, NOISE), (*GROUND EFFECT MACHINES, NOISE), VERTICAL TAKE-OFF PLANES, ACCELERATION, STRESSES, FORCE(MECHANICS), SOURCES, AIRPLANE NOISE, ENGINE NOISE (U)

THE BASIC MECHANISMS OF NOISE GENERATION DUE TO MASS INTRODUCTION, APPLIED FORCE AND APPLIED STRESS ARE DISCUSSED WITH REFERENCE TO THEIR IMPLICATIONS FOR HELICOPTERS, V/STOL AIRCRAFT, AND GROUND EFFECT MACHINES. THE SIGNIFICANCE OF THE DIMENSIONAL DEPENDENCE OF MONOPOLE, DIPOLE AND QUADRUPOLE FIELDS IS SHOWN. THE RESULTS OF A NEW THEORY GIVING THE EFFECTS OF SYSTEM ACCELERATIONS ON NOISE ARE PRESENTED. THIS THEORY WILL OFTEN HAVE APPLICATION TO NOISE PROBLEMS FOR THESE MACHINES BECAUSE OF THE CENTRIFUGAL ACCELERATIONS ASSOCIATED WITH MANY OF THE NOISE GENERATING COMPONENTS. SYSTEM ACCELERATIONS GIVE RISE TO HIGHER ORDER POLES IN THE SOUND FIELD WHICH BECOME PARTICULARLY IMPORTANT AT HIGH SPEEDS. AN EXPRESSION FOR THE SOUND FIELD PRODUCED BY FLUCTUATING LIFT AND DRAG FORCES IN A ROTATING AND CONVECTED SYSTEM IS GIVEN. AS A FURTHER EXAMPLE OF THE APPLICATION OF THE GENERAL THEORY THE SOUND FIELD RADIATED BY A HOVERING HELICOPTER IS ANALYZED. IT IS SHOWN HOW A PREVIOUSLY UNRECOGNIZED SOURCE OF SOUND ARISES FROM THE OUTWARD COMPONENTS OF FORCE INDUCED BY THE EFFECTS OF BLADE CONING ANGLE AND LAG. THE SOURCE OF SOUND HAS ITS MAXIMUM IN THE PLANE OF THE ROTOR DISC. THE IMPORTANCE OF INCLUDING THE PROPER MOMENTUM TERMS IN CALCULATIONS OF NOISE RADIATED BY MOVING MASS SOURCES IS DEMONSTRATED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-625 599 1/2 1/3
SYSTEMS TECHNOLOGY INC HAWTHORNE CALIF

AN ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER AND TRANSITION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
OCT 65 172P STAPLEFORD,R. L. ;WOLKOVITCH,J.
;MAGDALENO,R. E. ;SHORTWELL,C. P. ;JOHNSON,W. A. ;

REPT. NO. TR-140-1
CONTRACT: AF33(615)-1300
PROJ: AF-8219
TASK: 821909
MONITOR: AFFDL , TR-65-73

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CONVERTIBLE PLANES, HANDLING), (*SHORT TAKE-OFF PLANES, HANDLING), (*VERTICAL TAKE-OFF PLANES, HANDLING), GUSTS, HOVERING, PILOTS, CONTROL, DAMPING, HELICOPTERS, TILT WINGS, GEOMETRIC FORMS (U)

THE HOVER ANALYSIS CONSIDERS PILOT ATTITUDE AND POSITION CONTROL TASKS IN THE PRESENCE OF HORIZONTAL GUSTS. THE EFFECTS OF EACH OF THE STABILITY DERIVATIVES ON THE DIFFICULTY OF THE CONTROL TASKS AND ON THE CLOSED-LOOP GUST RESPONSES ARE DETERMINED. IT IS CLEARLY SHOWN THAT THE HANDLING QUALITIES STUDIES OF CONTROL SENSITIVITY AND ANGULAR DAMPING MUST CONSIDER THE INFLUENCES OF M SUB U (OR L SUB V) AND SHOULD INCLUDE GUST INPUTS. THESE CONCLUSIONS ARE SUBSTANTIATED BY PREVIOUS VARIABLE-STABILITY-HELICOPTER EXPERIMENTS. THE EFFECTS OF VEHICLE SIZE AND GEOMETRY ARE INVESTIGATED BY SEVERAL APPROACHES. THE KEY RESULT OF INCREASING SIZE IS FOUND TO BE A REDUCTION IN M SUB U AND L SUB V WHICH CAN, IN TURN, LOWER THE REQUIREMENTS FOR CONTROL POWER AND DAMPING. THE HANDLING QUALITIES DURING TRANSITION OF TWO VEHICLES, A TILT DUCT AND A TILT WING, WHICH WERE PREVIOUSLY TESTED ON A SIMULATOR ARE ANALYZED. IT IS SHOWN THAT BOTH TRIM CONTROL AND PERTURBATIONS ABOUT THE TRIM CONDITIONS MUST BE CONSIDERED. IN FACT, PART OF THE INCREASED DIFFICULTY IN LANDING TRANSITIONS, IN COMPARITON WITH TAKEOFF TRANSITIONS, IS DUE TO MORE DIFFICULT TRIM CONTROL; THE MUCH MORE STRINGENT POSITION CONTROL REQUIREMENTS IN LANDING ARE ALSO A CONTRIBUTING FACTOR. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-625 722 1/2 1/3
NAVAL AIR TEST CENTER PATUXENT RIVER MD

FLIGHT TEST EVALUATION OF THE UF-XS JAPANESE STOL SEAPLANE. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
AUG 64 59P VAGIANOS,NICHOLAS J. ;ROONEY, EUGENE C. ;
REPT. NO. FT2121-031R-64
TASK: RA1200005/201-1/WS417A0-0

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT TESTING), (*SEAPLANES, FLIGHT TESTING), JAPAN, HYDRODYNAMIC CHARACTERISTICS, STABILITY, PITCH(MOTION), TAKE-OFF, LANDINGS (U)
IDENTIFIERS: U-16 AIRCRAFT, EVALUATION (U)

THE UF-XS JAPANESE STOL SEAPLANE WAS EVALUATED TO DETERMINE THE FLYING QUALITIES IN CONFIGURATIONS PA, L, AND TO AT APPROACH SPEEDS IN THE VICINITY OF 55 KT AND THE HYDRODYNAMIC CHARACTERISTICS WHILE ON THE WATER. THE NASA AMES SIMULATOR SHOWED GOOD CORRELATION WITH THE AIRPLANE'S AERODYNAMIC CHARACTERISTICS. THE AIRPLANE HAS NEUTRAL TO UNSTABLE STATIC LONGITUDINAL STABILITY, WEAK DIRECTIONAL STABILITY, LARGE ADVERSE YAW, A LONG PERIOD MODERATELY DAMPED DUTCH ROLL MODE, A DIVERGENT SPIRAL MODE, AND TRIMS FOR FLIGHT IN A 13 DEGREE LEFT SIDESLIP. AN AUTOMATIC STABILIZATION EQUIPMENT (ASE) MAKES THE STATIC LONGITUDINAL STABILITY AND SPIRAL MODES POSITIVE BUT DOES NOT IMPROVE THE REMAINING ITEMS. TAKE-OFF AND LANDING TOUCHDOWN SPEED IS 50 KT. THE AIRPLANE HAS A HYDRODYNAMIC STABLE ELEVATOR RANGE OF 20 TO 35 DEGREES UP ELEVATOR. A 'DIGGING IN' AND SLIGHT 'PORPOISING' TENDENCY IS EXHIBITED AT ELEVATOR POSITIONS LESS THAN 20 DEGREES. THE AIRPLANE POSSESSES GOOD SPRAY CHARACTERISTICS. THE MISSION CAPABILITY OF A STOL SEAPLANE SHOULD GREATLY IMPROVE WITH REDUCTION IN TAKEOFF AND LANDING SPEED; HOWEVER, EVALUATION OF THE AIRPLANE AT LOWER SPEEDS WAS NOT POSSIBLE DUE TO SEVERAL AIRPLANE LIMITATIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-626 360 1/3
AMERICAN HELICOPTER SOCIETY NEW YORK

PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM (1ST), 3-4 NOVEMBER 1965, WRIGHTPATTERSON AFB, OHIO.(U)

65 375P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, SYMPOSIA), (*SHORT TAKE-OFF PLANES, SYMPOSIA), DESIGN, FLIGHT TESTING, OPERATION, PROPELLERS(AERIAL), PROPULSION, ATTITUDE CONTROL SYSTEMS, HOVERING, TILT WINGS (U)

THE TECHNICAL PAPERS PRESENTED ARE GROUPED INTO THE FOLLOWING THREE CATEGORIES:(1) V/STOL AIRCRAFT DESIGN, (2) V/STOL SUBSYSTEM DESIGN, AND (3) V/STOL AIRCRAFT TESTING AND OPERATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-629 632 1/1 1/3
ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

OV-1A MOHAWK FLIGHT LOADS INVESTIGATION PROGRAM. (U)

DESCRIPTIVE NOTE: ENGINEERING LAB. REPT.,
JAN 66 57P CHESTNUTT,DAVID ;
REPT. NO. USAAVLABS-TR-66-6,
PROJ: DA-1P125901A142
TASK: 1P125901A14229

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT), LOADING(MECHANICS), EXPERIMENTAL DATA, MANEUVERABILITY, DESIGN, ACCELERATION, AIRSPEED, ALTITUDE, WEIGHT
IDENTIFIERS: V-1 AIRCRAFT (U)
(U)

A PRIMARY OBJECTIVE OF THIS EFFORT WAS TO PROVIDE OPERATIONAL DATA FOR ESTABLISHING FUTURE SHORT TAKEOFF AND LANDING (STOL) AIRCRAFT DESIGN CRITERIA. TO ACCOMPLISH THIS END, TWO OV-1A AIRCRAFT WERE SELECTED THAT WERE PARTICIPATING IN AIR-ASSAULT MANEUVERS. APPROXIMATELY 200 HOURS OF FLIGHT DATA WERE RECORDED WITHIN APPROXIMATELY 10 WEEKS. THE PARAMETERS RECORDED WERE: AIRSPEED, ALTITUDE, OUTSIDE AIR TEMPERATURE, AND ACCELERATION AT THE AIRCRAFT CENTER OF GRAVITY. IN ADDITION, SUPPLEMENTARY DATA WERE COLLECTED ON THE TYPE OF MISSION AND GROSS WEIGHT OF THE AIRCRAFT. THESE DATA ARE PRESENTED AS SEVERAL FREQUENCY-OF-OCCURRENCE FORMS, EXCEEDANCE CURVES, AND GUST SPECTRA.
(AUTHOR)
(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-629 637 1/1
DYNASCIENCES CORP FORT WASHINGTON PA

AN INVESTIGATION OF PROPELLER SLIPSTREAM EFFECTS ON V/STOL AIRCRAFT PERFORMANCE AND STABILITY. (U)

DESCRIPTIVE NOTE: REPT. FOR APR 64-MAR 65, FEB 66 145P BUTLER,L. ;HUANG,K. P. ; GOLAND,L. ;
REPT. NO. DCR-174,
CONTRACT: DA-44-177-AMC-48(T),
TASK: 1D121401A14203,
MONITOR: USAAVLABS , TR-65-81

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), (*VERTICAL TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), (*PROPELLERS(AERIAL), STABILITY), STALLING, WINGS, PITCH(MOTION), ANALOG COMPUTERS (U)
IDENTIFIERS: SLIPSTREAM (U)

SPECIFIC AREAS INVESTIGATED INCLUDE WING STALL DURING TRANSITION, MINIMUM WING SIZE FOR STALL-FREE TRANSITION, AND THE EFFECTS OF SLIPSTREAM ON AIRCRAFT PITCHING MOMENTS. IN ADDITION, A STABILITY ANALYSIS WAS PERFORMED, AND ANALOG COMPUTER TECHNIQUES WERE USED TO DETERMINE THE FEASIBILITY OF UTILIZING THE SLIPSTREAM FOR STABILITY AUGMENTATION. FINALLY, THE EFFECTS OF THE NONUNIFORMITY OF SLIPSTREAM VELOCITY AND WING GEOMETRY MODIFICATIONS ON PERFORMANCE WERE ANALYZED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMOB

AD-629 647 1/1
BOEING CO MORTON PA VERTOL DIV

INVESTIGATION OF AN ISOLATED MONOCYCLIC V/STOL PROPELLER PERFORMANCE AND OSCILLATORY STRESS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 66 122P DE DECKER,R. W. ;
REPT. NO. R-432,
CONTRACT: DA-44-177-AMC-319(T),
PROJ: DA-1P121401A141
TASK: 1P121401A14178,
MONITOR: USAAVLABS , TR-65-80

UNCLASSIFIED REPORT

DESCRIPTORS: (*PROPELLERS(AERIAL), PERFORMANCE(ENGINEERING)), (*VERTICAL TAKE-OFF PLANES, TESTS), (*SHORT TAKE-OFF PLANES, TESTS), OSCILLATION, STRESSES, PROPELLER BLADES, CONTROL, AERODYNAMIC CHARACTERISTICS, PITCH(MOTION), STALLING, DRAG (U)

TEST RESULTS CONFIRMED: (1) THAT THERE IS AN APPARENT PHASE SHIFT OF THE MONOCYCLIC AXIS AT HIGH COLLECTIVE ANGLE, CAUSED BY HYSTERESIS IN THE AIRFOIL'S STALL CHARACTERISTICS, AND (2) THAT THERE IS AN INCREASE IN SIDE FORCE AS COLLECTIVE ANGLE IS INCREASED, CAUSED BY A NONLINEAR VARIATION IN AIRFOIL DRAG WITH CYCLIC PITCH. THE MONOCYCLIC PROPELLER TEST PROGRAM ALSO INCLUDED INVESTIGATION OF THE EFFECTS OF CONTROL SYSTEM STIFFNESS ON THE DYNAMIC RESPONSE OF THE PROPELLER AND CONTROL SYSTEM. THE RESULTS INDICATE THAT THE USE OF CYCLIC-BLADE-PITCH CONTROL REDUCES THE HARMONIC CONTENT OF CONTROL SYSTEM OSCILLATORY LOADS TO BASICALLY A FIRST-HARMONIC RESPONSE. HIGHER HARMONIC LOADS ARE PRESENT, BUT THEIR AMPLITUDES ARE LESS THAN 10 PERCENT OF THE RESULTANT PEAK-TO-PEAK LOAD, AND ARE THEREFORE CONSIDERED NEGLIGIBLE. THE RESULTS OF THE PROGRAM ALSO INDICATE THAT THE INCREASE OF CONTROL SYSTEM STIFFNESS RESULTED IN AN INCREASE IN BLADE-PITCH-LINK OSCILLATORY LOADS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-634 548 1/3
AMERICAN HELICOPTER SOCIETY NEW YORK

PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM (1ST), SUPPLEMENT, HELD 3-4 NOVEMBER 1965 AT WRIGHT-PATTERSON AFB, OHIO. (U)

NOV 65 143P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, SYMPOSIA), (*SHORT TAKE-OFF PLANES, SYMPOSIA), DESIGN, FLIGHT TESTING, LIFT, FANS (U)
IDENTIFIERS: X-22 AIRCRAFT (U)

A DESCRIPTION OF THE X-22A AIRPLANE AND ITS SYSTEMS IS GIVEN INCLUDING THE SPECIAL TESTING UNDERTAKEN TO PROVE THESE SYSTEMS. TEST PROGRESS AND CERTAIN PROBLEM AREAS RELATED TO VTOL DESIGN ARE DISCUSSED. TEST PILOT PARTICIPATION IN THE PRE-FLIGHT PHASES OF THE PROGRAM AND PILOT PREPARATION FOR FIRST FLIGHTS IS DESCRIBED. PROGRESS IN GROUND TEST BUILDUP TO FIRST FLIGHT IS REPORTED. APPROACH TO FIRST FLIGHT AND DEVELOPMENT OF V/STOL PROFILES IS COVERED AND THE DEMONSTRATION PROGRAM INCLUDING MILITARY PARTICIPATION IS OUTLINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-634 722 20/4
DYNASCIENCES CORP FORT WASHINGTON PA

CHARTS FOR ESTIMATING AERODYNAMIC FORCES ON STOL AIRCRAFT WINGS IMMERSED IN PROPELLER SLIPSTREAMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
NOV 65 81P HUANG, K. P. !GOLAND,L. !BALIN, I. !
REPT. NO. DCR-161,
CONTRACT: NOW-64-0316

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMICS), (*WINGS, AERODYNAMIC CHARACTERISTICS), MATHEMATICAL PREDICTION, PROPELLERS(AERIAL), FORCE(MECHANICS), LIFT (U)
IDENTIFIERS: SLIPSTREAM (U)

EQUATIONS AND CHARTS ARE PRESENTED FOR ESTIMATING THE LIFT AND LONGITUDINAL FORCE COEFFICIENTS OF STOL AIRCRAFT WINGS IMMERSED IN PROPELLER SLIPSTREAMS. SAMPLE CALCULATIONS ARE MADE AND THE RESULTS SHOW FAIR TO GOOD CORRELATION WITH AVAILABLE EXPERIMENTAL DATA. THE EFFECT OF MANY DESIGN AND OPERATING PARAMETERS IS ANALYZED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-637 133 1/2
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ

PRINCIPLES FOR IMPROVING STRUCTURAL CRASHWORTHINESS FOR STOL AND CTOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.
JUN 66 73P REED,WILLIAM H. ;AVERY,JAMES P. ;
REPT. NO. AVSER-65-18,
CONTRACT: DA-44-177-AMC-254(T),
TASK: 1P125901A14230,
MONITOR: USAAVLABS TR-66-39

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*AVIATION ACCIDENTS, *SHORT TAKE-OFF PLANES), AIRFRAMES, LOADING(MECHANICS), IMPACT SHOCK, DEFORMATION, AVIATION SAFETY, ACCELERATION, CRASH INJURIES, DESIGN (U)
IDENTIFIERS: CRASHWORTHINESS (U)

THE AREA OF CRASH BEHAVIOR ANALYSIS OF AIRCRAFT STRUCTURES IS INVESTIGATED. THE INVESTIGATION BEGINS WITH THE DEFINITION OF TWO INDICES OF CRASHWORTHINESS OF BASIC AIRCRAFT STRUCTURES AND THE ANALYSIS OF THE INFLUENCE OF SEVERAL GENERAL TYPES OF STRUCTURAL MODIFICATIONS UPON THESE TWO INDICES. THIS ANALYSIS, USING FUNDAMENTAL PRINCIPLES OF MECHANICS, CONTAINS SEVERAL SIMPLIFYING ASSUMPTIONS, WHICH ARE EXPLAINED AS THEY ARE INTRODUCED. DESIGN CONCEPTS TO IMPROVE THE ABILITY OF THE 'PROTECTIVE CONTAINER' TO MAINTAIN LIVING SPACE FOR OCCUPANTS DURING A CRASH OR TO ATTENUATE THE ACCELERATIONS EXPERIENCED BY OCCUPANTS DURING A CRASH ARE DEVELOPED FOR CRASH CONDITIONS WHICH ARE EITHER PRIMARILY LONGITUDINAL IN NATURE OR PRIMARILY VERTICAL IN NATURE. ANALYTICAL METHODS ARE THEN PROVIDED TO SHOW HOW AND WHEN TO APPLY THESE DESIGN CONCEPTS TO ANY PARTICULAR AIRCRAFT. THE PRINCIPLES WHICH ARE PRESENTED ARE SUITABLE FOR USE DURING DESIGN OF NEW AIRCRAFT AS WELL AS MODIFICATION OF EXISTING AIRCRAFT. THE RESULTS ARE PRESENTED FROM THREE FULL-SCALE CRASH TESTS OF SMALL TWIN-ENGINE AIRPLANES WHICH WERE CONDUCTED AS A PART OF THIS INVESTIGATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMC8

AD-641 506 15/5 5/3
MCDONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR INTERCITY SHORT-HAUL TRANSPORTATION. VOLUME I. (U)

DESCRIPTIVE NOTE: FINAL REPT.
APR 66 47P
CONTRACT: FA-65-WA-1246
MONITOR: FAA-ADS 74-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE AD-641 507 AND AD-641-508.

DESCRIPTORS: (•AIR TRANSPORTATION, •ECONOMICS), (•SHORT TAKE-OFF PLANES, ECONOMICS), (•VERTICAL TAKE-OFF PLANES, ECONOMICS), COMMERCIAL PLANES, COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA, SIMULATION, OPERATION (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL TRAVELERS. THE AIR TRAVEL MARKET IN THE CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND SAN FRANCISCO ON THE NORTH) WAS USED FOR THE STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS, AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL HELICOPTER WAS INCLUDED FOR COMPARISON. THE SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL ECONOMIC VIABILITY, STOL AND VTOL AIRLINE SERVICE WAS SIMULATED IN THE CALIFORNIA CORRIDOR IN 1975 AND 1980, AND THEN COMPARED WITH THE CONVENTIONAL JET SIMULATION IN THOSE YEARS. IT WAS FOUND THAT THE TIME SAVINGS AND CONVENIENCE PROVIDED BY EITHER STOL OR VTOL AIRLINE SERVICE WOULD ENABLE STOL OR VTOL TO CAPTURE A SUBSTANTIAL SHARE OF THE SHORT-HAUL AIR TRAVEL MARKET WHEN COMBINED IN A SYSTEM WITH CONVENTIONAL JETS, AND WOULD INDUCE ADDITIONAL AIR TRAVEL. THIS SYSTEM WOULD GIVE A SATISFACTORY RETURN ON INVESTMENT. THE REPORT IS IN THREE VOLUMES. VOLUME I IS AN EXECUTIVE SUMMARY CONTAINING INTRODUCTION, CONCLUSIONS, AND THE SUMMARY OF METHOD AND RESULTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-641 507 15/5 5/3
MCDONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR INTERCITY SHORT-HAUL TRANSPORTATION. VOLUME II. (U)

DESCRIPTIVE NOTE: FINAL REPT.
APR 66 190P
CONTRACT: FA-65-WA-1246
MONITOR: FAA-ADS 74-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 506 AND AD-641 508.

DESCRIPTORS: (*AIR TRANSPORTATION, *ECONOMICS), (*SHORT TAKE-OFF PLANES, ECONOMICS), (*VERTICAL TAKE-OFF PLANES, ECONOMICS), COMMERCIAL PLANES, COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA, SIMULATION, AIRPLANE NOISE, OPERATION (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL TRAVELERS. THE AIR TRAVEL MARKET IN THE CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND SAN FRANCISCO ON THE NORTH) WAS USED FOR THE STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS, AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL HELICOPTER WAS INCLUDED FOR COMPARISON. THE SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL ECONOMIC VIABILITY, STOL AND VTOL AIRLINE SERVICE WAS SIMULATED IN THE CALIFORNIA CORRIDOR IN 1975 AND 1980, AND THEN COMPARED WITH THE CONVENTIONAL JET SIMULATION IN THOSE YEARS. IT WAS FOUND THAT THE TIME SAVINGS AND CONVENIENCE PROVIDED BY EITHER STOL OR VTOL AIRLINE SERVICE WOULD ENABLE STOL OR VTOL TO CAPTURE A SUBSTANTIAL SHARE OF THE SHORT-HAUL AIR TRAVEL MARKET WHEN COMBINED IN A SYSTEM WITH CONVENTIONAL JETS, AND WOULD INDUCE ADDITIONAL AIR TRAVEL. THIS SYSTEM WOULD GIVE A SATISFACTORY RETURN ON INVESTMENT. THE REPORT IS IN THREE VOLUMES. VOLUME I IS AN EXECUTIVE SUMMARY CONTAINING INTRODUCTION, (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-641 508 15/5 5/3
MCDONNELL AIRCRAFT CORP ST LOUIS MO

TECHNICAL AND ECONOMIC EVALUATION OF AIRCRAFT FOR INTERCITY SHORT-HAUL TRANSPORTATION. VOLUME III. (U)

DESCRIPTIVE NOTE: FINAL REPT.
APR 66 178P
CONTRACT: FA-65-WA-1246
MONITOR: FAA-ADS 74-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-641 507 AND AD-641 506.

DESCRIPTORS: (•AIR TRANSPORTATION, •ECONOMICS), (•SHORT TAKE-OFF PLANES, ECONOMICS), (•VERTICAL TAKE-OFF PLANES, ECONOMICS), COMMERCIAL PLANES, COSTS, AIRPORTS, AIR TRAFFIC, CALIFORNIA, SIMULATION, OPERATION, AIRPLANE NOISE (U)

THIS REPORT EVALUATES THE POTENTIAL AIRLINE USE OF STOL/VTOL AIRCRAFT TO SERVE INTERCITY SHORT HAUL TRAVELERS. THE AIR TRAVEL MARKET IN THE CALIFORNIA CORRIDOR (BETWEEN LOS ANGELES AND SAN DIEGO ON THE SOUTH AND SACRAMENTO AND SAN FRANCISCO ON THE NORTH) WAS USED FOR THE STUDY BUT THE RESULTS WOULD BE GENERALLY APPLICABLE TO OTHER AREAS. BASED ON 1970 TECHNOLOGY, FOUR STOL AND VTOL AIRCRAFT CONFIGURATIONS WERE DESIGNED AS 60-, 90-, AND 120-PASSENGER TRANSPORTS, AND DEVELOPED FOR LOWEST OPERATING COSTS FOR A 500-MILE STAGE LENGTH. A CONVENTIONAL JET TRANSPORT WAS USED AS A BASE OF REFERENCE AND A CONVENTIONAL HELICOPTER WAS INCLUDED FOR COMPARISON. THE SPECIAL STOL/VTOL AIRPORTS WERE LOCATED FOR PASSENGER CONVENIENCE AND ACCEPTABLE NOISE LEVELS FOR THE SURROUNDING AREAS. TO EVALUATE STOL/VTOL ECONOMIC VIABILITY, STOL AND VTOL AIRLINE SERVICE WAS SIMULATED IN THE CALIFORNIA CORRIDOR IN 1975 AND 1980, AND THEN COMPARED WITH THE CONVENTIONAL JET SIMULATION IN THOSE YEARS. IT WAS FOUND THAT THE TIME SAVINGS AND CONVENIENCE PROVIDED BY EITHER STOL OR VTOL AIRLINE SERVICE WOULD ENABLE STOL OR VTOL TO CAPTURE A SUBSTANTIAL SHARE OF THE SHORT-HAUL AIR TRAVEL MARKET WHEN COMBINED IN A SYSTEM WITH CONVENTIONAL JETS, AND WOULD INDUCE ADDITIONAL AIR TRAVEL. THIS SYSTEM WOULD GIVE A SATISFACTORY RETURN ON INVESTMENT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDMOA

AD-645 863 14/2 1/3
PRINCETON UNIV N J DEPT OF AEROSPACE AND MECHANICAL SCIENCES

GENERAL DESCRIPTION OF THE PRINCETON DYNAMIC MODEL TRACK, (U)

NOV 66 31P CURTISS,H. C. ;PUTMAN,W. F. ; TRAYBAR,J. J. ;

REPT. NO. 738
CONTRACT: DA-44-177-AMC-8(T)
TASK: 1P125901A14233
MONITOR: USAAVLABS TR-66-73

UNCLASSIFIED REPORT

DESCRIPTORS: (*TRACKS(AERODYNAMICS), SHORT TAKE-OFF PLANES), DESIGN, HYDRAULIC SYSTEMS, AIRPLANE MODELS, AERODYNAMIC CHARACTERISTICS, VELOCITY, MODEL TESTS (U)

THE PRINCETON DYNAMIC MODEL TRACK IS A FACILITY WHICH CONSISTS OF A SERVOCONTROLLED HYDRAULICALLY POWERED MODEL CARRIAGE MOUNTED ON A MONORAIL TRACK. THE TRACK IS HOUSED INSIDE A 30-BY-30-FOOT BUILDING 750 FEET LONG. THE CARRIAGE CONTAINS A MODEL MOUNT DESIGNED TO ALLOW THE CARRIAGE TO FOLLOW THE POWERED MODEL WITHOUT IMPOSING RESTRAINTS ON THE MODEL MOTIONS BEING STUDIED. FROM ONE TO FIVE DEGREES OF FREEDOM MOTIONS CAN BE EXAMINED, BOTH LONGITUDINAL AND LATERAL-DIRECTIONAL, IN OR OUT OF GROUND EFFECT. THE DYNAMIC MODEL TRACK CAN PROVIDE STATIC AND DYNAMIC DERIVATIVE DATA (E.G., VELOCITY AND RATE-DEPENDENT AERODYNAMIC STABILITY AND CONTROL DERIVATIVES) ON V/STOL AIRCRAFT MODELS OR COMPONENTS IN AND NEAR HOVER, SLOW SPEED FLIGHT, AND DURING TRANSITION. IN ADDITION, IT CAN PROVIDE AN EXPERIMENTAL SIMULATION OF THE EXPECTED FULL-SCALE VEHICLE CONTROL-FIXED DYNAMIC MOTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M0R

AD-652 926 1/3
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

FLIGHT TEST INSTRUMENTATION FOR V/STOL AIRCRAFT. (U)

APR 61 66P BRUNING,G. I
REPT. NO. AGARD-317

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT TESTING), (*VERTICAL TAKE-OFF PLANES, FLIGHT TESTING), (*FLIGHT TESTING, INSTRUMENTATION), OPTIMIZATION, TEST METHODS, AIRBORNE, RECORDING SYSTEMS, TEST EQUIPMENT, FRANCE (U)

THE FLIGHT TESTING OF V/STOL AIRCRAFT INVOLVES THE MEASUREMENT OF CERTAIN QUANTITIES, SOME OF WHICH ARE THE SAME AS FOR CONVENTIONAL AIRCRAFT. WHERE THE QUANTITIES ARE DIFFERENT, THOSE CONCERNED IN THE V/STOL FIELD HAVE TACKLED THE NEW PROBLEMS IN THEIR OWN WAY. GENERAL ASPECTS ARE CONSIDERED, SOME ILLUSTRATIVE EXAMPLES ARE GIVEN, THE PHYSICAL QUANTITIES OF INTEREST IN V/STOL TESTING ARE DISCUSSED, AND RECORDING METHODS ARE DESCRIBED. FINALLY, AN ATTEMPT IS MADE TO SUGGEST AN OPTIMUM INSTRUMENTATION. IT IS CONCLUDED THAT MOST OF THE QUANTITIES OF INTEREST CAN BE MEASURED BY CONVENTIONAL METHODS, WHEREAS OTHERS, SUCH AS LOW HORIZONTAL SPEEDS, ALTITUDE, AND RATE OF CLIMB AND DESCENT, PRESENT DIFFICULTIES. THERE IS AN OBVIOUS DEMAND FOR LIGHTER AIRBORNE EQUIPMENT THAN IS AVAILABLE AT PRESENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-652 998 1/3 1/1
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT PARIS (FRANCE)

METHODES UTILISEES POUR LA MISE AU POINT DE L'AVION BREGUET 940 A AILES SOUFFLEES (METHODS USED FOR THE FINAL DESIGN ANALYSIS OF THE BREGUET 940 'BLOWER-WING' PLANE), (U)

APR 61 25P DERICHEMONT,G. ;
REPT. NO. AGARD-371

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. TEXT IN FRENCH; DISCUSSION PARTLY IN ENGLISH; ADDENDUM IN ENGLISH.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, DESIGN), AERODYNAMIC CHARACTERISTICS, MODEL TESTS, WIND TUNNEL MODELS, FLIGHT TESTING, FLIGHT SIMULATORS, TRANSPORT PLANES, FRANCE (U)
IDENTIFIERS: BREGUET 940 (U)

MANY COORDINATED METHODS WERE UTILIZED IN THE STUDY OF THE DYNAMIC CHARACTERISTICS OF THE AIRCRAFT BREGUET 940. METHODS OF STUDY INCLUDED UTILIZATION OF A FIXED MODEL IN A WIND TUNNEL, A MOTORIZED FLYING MODEL, AN ELECTRONIC FLIGHT SIMULATOR, AND OBSERVATIONS OF THE AIRCRAFT ITSELF IN FLIGHT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-654 469 1/3 1/1
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS

XV-11A DESCRIPTION AND PRELIMINARY FLIGHT TEST. (U)

DESCRIPTIVE NOTE: RESEARCH REPT.,
MAY 67 106P ROBERTS,SEAN C. ;STEWART, ABERDEEN W. ;BOAZ,VIRGIL L. ;BRYANT,GLENN D. ;MERTAUGH,LAWRENCE J. , JR;
REPT. NO. AEROPHYSICS-RR-75
CONTRACT: DA-44-177-AMC-266(T)
PROJ: DA-1F125901A142
TASK: 1F125901A14203
MONITOR: USAAVLABS TR-67-21

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT TESTING), GLASS TEXTILES, POLYESTER PLASTICS, REINFORCING MATERIALS, LIFT, CAMBER, BOUNDARY LAYER CONTROL, SHROUDED PROPELLERS, AERODYNAMIC CHARACTERISTICS (U)
IDENTIFIERS: V-11 AIRCRAFT (U)

THE XV-11A IS A POLYESTER REINFORCED FIBER GLASS STOL AIRCRAFT. THIS FOUR-PLACE AIRCRAFT, POWERED BY A 250-HORSEPOWER T-63 TURBINE ENGINE, WAS DESIGNED TO ACHIEVE HIGH-LIFT COEFFICIENTS BY MEANS OF A VARIABLE CAMBER WING WITH DISTRIBUTED SUCTION BOUNDARY LAYER CONTROL. A SHROUDED PROPELLER WAS USED FOR THRUST AUGMENTATION AT LOW FORWARD VELOCITIES, AND BETA CONTROL ON THE PROPELLER WAS SUCCESSFULLY USED AS A DRAG INCREMENT FOR GLIDE PATH CONTROL. TO DATE, THE XV-11A AIRCRAFT HAS FLOWN 49 FLIGHTS WITH A TOTAL FLIGHT TIME OF 35 HOURS. THE MAJORITY OF THE FLIGHT TIME WAS INVOLVED IN AERODYNAMIC RESEARCH OF THE SHROUDED PROPELLER, THE DISTRIBUTED SUCTION BOUNDARY LAYER CONTROL SYSTEM AND IN AN EVALUATION OF THE GENERAL HANDLING CHARACTERISTICS OF THE AIRCRAFT. A MINIMUM OF PERFORMANCE DATA WAS COLLECTED SINCE THE PRIMARY OBJECTIVE WAS AERODYNAMIC RESEARCH. THE FIBER GLASS MATERIAL DEMONSTRATED THE EXCELLENT POSSIBILITIES OF THIS TYPE OF CONSTRUCTION WHEN COMPLEX, AERODYNAMICALLY SMOOTH CURVATURES ARE DESIRED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-656 810 14/2 20/4 1/1
WASHINGTON UNIV SEATTLE

LIMITS ON MINIMUM-SPEED V/STOL WIND-TUNNEL TESTS. (U)

DESCRIPTIVE NOTE: REVISED ED.,
JAN 67 10P RAE,WILLIAM H. , JR.
CONTRACT: DA-ARO(D)-31-124-G481
PROJ: AROD-4506E, DA-2001450183G
MONITOR: AROD 4506.2-E

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN JOURNAL OF AIRCRAFT V4 N3 P249-54 MAY-JUNE 1967.
SUPPLEMENTARY NOTE: REVISION OF MANUSCRIPT SUBMITTED 30 SEP 66. PRESENTED AT THE AIAA AERODYNAMIC TESTING CONFERENCE, LOS ANGELES, CALIF., 21-23 SEP 66. PREPRINT 66-736.

DESCRIPTORS: (*ROTARY WINGS, MODEL TESTS), WIND TUNNEL MODELS, SHORT TAKE-OFF PLANES, WIND TUNNELS, ACCURACY, SIMULATION, DOWNWASH, GEOMETRIC FORMS, JET FLAPS (U)

THE PAPER PRESENTS THE RESULTS OF A SYSTEMATIC SERIES OF WIND-TUNNEL TESTS, WHICH HAVE DETERMINED THE MAXIMUM SIZE ROTOR THAT CAN BE TESTED IN CLOSED-THROAT WIND TUNNELS BOTH AS A FUNCTION OF THE DOWNWASH ANGLE AND AS A FUNCTION OF TUNNEL GEOMETRY. FOR A GIVEN SIZE ROTOR AND TUNNEL THERE APPEARS TO BE A MAXIMUM VALUE OF DOWNWASH THAT CAN BE TOLERATED. IF THIS VALUE OF DOWNWASH IS EXCEEDED, THE FLOW THROUGH THE WIND TUNNEL IS NO LONGER SIMILAR TO THE FLOW THAT WOULD BE ENCOUNTERED IN FREE FLIGHT BUT RATHER REPRESENTS A FLOW SIMILAR TO RECIRCULATION. THE POINT AT WHICH THE MAXIMUM DOWNWASH IS REACHED IS CALLED THE FLOW BREAKDOWN POINT. SIMILAR RESULTS HAVE ALSO BEEN OBTAINED USING JET FLAPS AND JET-LIFT MODELS. IT IS ALSO SHOWN THAT THIS FLOW BREAKDOWN IS A FUNCTION OF TUNNEL GEOMETRY AND THAT THE ALLOWABLE DOWNWASH ANGLES ARE DIFFERENT FOR RECTANGULAR TUNNELS WITH WIDTH-TO-HEIGHT RATIOS OF W/H = 1.50, 1.00, 0.67, AND 0.50. THE ADDITION OF FILLETS TO THE TEST SECTION IS ALSO SHOWN TO HAVE AN ADVERSE EFFECT ON THE ALLOWABLE DOWNWASH ANGLE. AT THE PRESENT TIME, THE OPTIMUM TUNNEL CONFIGURATION FOR ROTORS AND OTHER TYPES OF V/STOL VEHICLES IS NOT KNOWN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /20H08

AD-657 562 1/3 20/4 1/1
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME 1. PROPELLER AND ROTOR AERODYNAMICS. HELD JUNE 22, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 275P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-657 563.

DESCRIPTORS: (*HELICOPTERS, *AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA, PROPELLERS(AERIAL), ROTOR BLADES(ROTARY WINGS), PERFORMANCE(ENGINEERING), HELICOPTER ROTORS, TESTS, STRESSES, PREDICTIONS, AERODYNAMIC LOADING, WAKE, VORTICES, THEORY (U)

CONTENTS: A THEORY FOR STATIC PROPELLER PERFORMANCE; PROPELLER TESTING AT ZERO VELOCITY; PROPELLER RESEARCH AT CANADAIR LIMITED; PREDICTION OF THE PERFORMANCE AND STRESS CHARACTERISTICS OF VTOL PROPELLERS; PERFORMANCE POTENTIAL OF ROTOR BLADE INBOARD AERODYNAMIC DEVICES; AERODYNAMIC LOADING OF HIGH-SPEED ROTORS; PREDICTION OF ROTOR WAKE FLOWS; THE MOVEMENT, STRUCTURE AND BREAKDOWN OF TRAILING VORTICES FROM A ROTOR BLADE. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOP

AD-657 563 1/3 20/4 1/1
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME II. PROPULSION AND INTERFERENCE AERODYNAMICS. HELD JUNE 23, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 330P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-657 562 AND VOLUME 3, AD-657 564.

DESCRIPTORS: (*HELICOPTERS; *AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA, PROPULSION, PROPELLERS(AERIAL), SHROUDED PROPELLERS, FANS, TURBINES, NOZZLES, WINGS, AIRFOILS, LIFT, SHEAR STRESSES, INTERFERENCE (U)

CONTENTS: PREDICTED AND MEASURED PERFORMANCE OF TWO FULL-SCALE DUCTED PROPELLERS; AEROTHERMAL DYNAMIC PERFORMANCE OF A HIGH BYPASS TIP TURBINE CRUISE FAN SYSTEM; THRUST DEFLECTION NOZZLES FOR VTOL AIRCRAFT; SHROUDED PROPELLER RESEARCH AT MISSISSIPPI STATE UNIVERSITY LEADING TO APPLICATION ON THE UNITED STATES ARMY XV-11A; THE LIFT, DRAG AND STABILITY OF WINGS IMMERSED IN PROPELLER SLIPSTREAM; AERODYNAMIC PROPERTIES OF AIRFOILS IN NONUNIFORMLY SHEARED FLOWS; EXPERIMENTAL INVESTIGATION OF COMPOUND HELICOPTER AERODYNAMIC INTERFERENCE EFFECTS; MAXIMUM LIFT COEFFICIENT FOR STOL AIRCRAFT; A CRITICAL REVIEW. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM06

AD-657 564 1/3 20/4 1/1
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME III. AERODYNAMIC RESEARCH ON BOUNDARY LAYERS. HELD JUNE 24, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 154P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-657 563 AND VOLUME 4, AD-657 565.

DESCRIPTORS: (*HELICOPTERS, *AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA, BOUNDARY LAYER, ROTOR BLADES(ROTARY WINGS), PERFORMANCE(ENGINEERING), HOVERING, BOUNDARY LAYER CONTROL SYSTEMS, LOW-DRAG AIRFOILS, FEASIBILITY STUDIES, LIFT (U)

CONTENTS: SPANWISE FLOW EFFECTS ON ROTOR PERFORMANCE; A PRELIMINARY STUDY OF THE EFFECT OF A RADIAL PRESSURE GRADIENT ON THE BOUNDARY LAYER OF A ROTOR BLADE; THE BOUNDARY LAYER OF THE HOVERING ROTOR; AN INVESTIGATION OF THE FEASIBILITY OF A COMMON BOUNDARY LAYER CONTROL SYSTEM FOR HIGH-LIFT AND LOW-DRAG ON AN AIRFOIL SECTION. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOH

AD-657 565 1/3 20/4 1/3
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

CAL/USAAVLABS SYMPOSIUM PROCEEDINGS. AERODYNAMIC PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT. VOLUME IV. PANELS ON RECOMMENDED V/STOL AERODYNAMIC RESEARCH, PANEL SUMMARIES, FEATURED SPEAKERS, AND TECHNICAL PAPER DISCUSSIONS. HELD JUNE 22-24, 1966, STATLER-HILTON HOTEL, BUFFALO, NEW YORK. (U)

JUN 66 382P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, AD-657 564.

DESCRIPTORS: (*HELICOPTERS, *AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), SYMPOSIA, ROTARY WINGS, STABILITY, CONTROL, TILT WINGS, SCIENTIFIC RESEARCH (U)

THE FOLLOWING TECHNICAL PAPERS WERE PRESENTED: AERONAUTICAL RESEARCH REQUIREMENTS AS DETERMINED FROM THE X-19 AND X-100 VTOL PROGRAMS; THOUGHTS ON PROGRESS IN ROTATING-WING AERODYNAMICS; SOME POSSIBILITIES FOR RESEARCH ON STABILITY AND CONTROL AT STOL FLIGHT SPEEDS; AERODYNAMIC RESEARCH - IMPROVEMENTS OF THE TILT WING CONCEPT; AERODYNAMIC PROBLEM AREAS OF V/STOL AIRCRAFT AND RECOMMENDED RESEARCH; A DISCUSSION OF LOW SPEED VTOL AERODYNAMIC PROBLEMS AND SUGGESTIONS FOR RELATED RESEARCH; AREAS OF FRUITFUL RESEARCH AND DEVELOPMENT FOR ROTARY WING AIRCRAFT; A COMEBACK OF LOW-SPEED AERODYNAMICS RESEARCH; REQUIRED AERODYNAMIC RESEARCH FOR V/STOL AIRCRAFT; LOW SPEED AERODYNAMIC PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT; SELECTED RESEARCH RESULTS AND RECOMMENDATIONS FOR AERODYNAMIC RESEARCH; RECOMMENDATIONS FOR AERODYNAMIC RESEARCH ON HELICOPTERS AND V/STOL AIRCRAFT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-658 432 1/3 20/4 1/1
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

A REVIEW OF JET EFFLUX STUDIES APPLICABLE TO V/STOL AIRCRAFT, (U)

SEP 67 20P GARNER, JACK E. ;
REPT. NO. AEDC-TR-67-163
CONTRACT: AF 40(600)-1200
PROJ: AF-7778

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO, INC., TULLAHOMA, TENN.

DESCRIPTORS: (*EXHAUST GASES, *JETS), (*SHORT TAKE-OFF PLANES, EXHAUST GASES), STATE-OF-THE-ART REVIEWS, VERTICAL TAKE-OFF PLANES, FLOW FIELDS, SUBSONIC FLOW, THRUST (U)

THE STATE-OF-THE-ART OF JETS EXHAUSTING INTO A SUBSONIC CROSSFLOW IS PRESENTED. THESE STUDIES COMPLEMENT THE CURRENT RESEARCH EFFORT IN DEVELOPMENT OF AN ANALYTICAL DESCRIPTION OF THE FLOW FIELD CREATED BY A V/STOL AIRCRAFT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOA

AD-658 545 1/3 5/2
AIR FORCE FLIGHT TEST CENTER EDWARDS AFB CALIF

THE REPORT OF THE AD HOC COMMITTEE ON VSTOL TERMINOLOGY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 67 17P RANSONE,ROBIN K. ;BASQUEZ, JOSEPH G. ;
REPT. NO. AFFTC-SP-67-1001

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, VOCABULARY); (*SHORT TAKE-OFF PLANES, VOCABULARY); HELICOPTERS, STANDARDIZATION, TAKE-OFF, AIRCRAFT LANDINGS, FLIGHT (U)

THE REPORT IS A STANDARDIZED LIST OF DEFINITIONS ASSOCIATED WITH VERTICAL SHORT TAKEOFF AND LANDING AIRCRAFT. CONTRIBUTIONS WERE MADE FROM AMONG THE SEVERAL MILITARY SERVICES AND AIRCRAFT COMPANIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO: /ZOM08

AD-659 510 17/7 1/4
ADCOLE CORP WALTHAM MASS

V/STOL APPROACH SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 66 26P
CONTRACT: FA-WA-4582
PROJ: FAA-320-103-01N
MONITOR: FAA-RD 66-56

UNCLASSIFIED REPORT

DESCRIPTORS: (*GLIDE PATH SYSTEMS, SHORT TAKE-OFF PLANES), (*APPROACH INDICATORS, SHORT TAKE-OFF PLANES), VERTICAL TAKE-OFF PLANES, MICROWAVE EQUIPMENT, FEASIBILITY STUDIES, LANDING AIDS, K BAND, AIR TRAFFIC CONTROL SYSTEMS (U)

THE REPORT DESCRIBES A FEASIBILITY MODEL MICROWAVE INSTRUMENT LANDING SYSTEM (ILS) DEVELOPED FOR THE FEDERAL AVIATION AGENCY. TRANSMITTED FREQUENCY: 15.4 KMC, LOCALIZER CLEARANCE: PLUS OR MINUS 45 DEGREES, GLIDE SLOPE CLEARANCE: PLUS OR MINUS 15 DEGREES. SYSTEM HAS BEEN SUCCESSFULLY DEMONSTRATED AT NAFEC. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM0R

AD-661 748 1/2 1/3 1/4
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

RECOMMENDATIONS FOR V/STOL HANDLING QUALITIES WITH AN ADDENDUM CONTAINING COMMENTS ON THE RECOMMENDATIONS. (U)

OCT 64 71P
REPT. NO. AGARD-408A

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, HANDLING), (*SHORT TAKE-OFF PLANES, HANDLING), HELICOPTERS, FLIGHT, AERONAUTICS, FLIGHT CONTROL SYSTEMS, MANEUVERABILITY, STABILITY, HOVERING, ROLL, PITCH(MOTION) (U)

THE RECOMMENDATIONS, WHICH ARE NECESSARILY TENTATIVE, PARTICULARLY AS REGARDS THEIR APPLICATION TO LARGE AIRCRAFT, ARE BASED IN SOME RESPECTS ON REQUIREMENTS FOR U. S. MILITARY HELICOPTERS. BUT CONSIDERABLE USE HAS BEEN MADE OF THE RESULTS OF FLIGHT ASSESSMENTS OF HANDLING QUALITIES OF A NUMBER OF V/STOL RESEARCH AIRCRAFT. TO IMPROVE THEIR VALIDITY, THEY SHOULD BE KEPT UNDER CONTINUAL REVIEW BY CRITICAL, SYSTEMATIC COMPARISON WITH THE ACCEPTED HANDLING QUALITIES OF AS MANY NEW V/STOL AIRCRAFT AS POSSIBLE. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-661 951 20/4 1/1 14/2
ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT PARIS (FRANCE)

TUNNEL-WALL EFFECTS ASSOCIATED WITH VTOL-STOL MODEL TESTING, (U)

MAR 59 34P KUHN,R. E. INAESETH,R. L. ;
REPT. NO. AGARD-303

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. PRESENTED AT THE INTERFERENCE EFFECTS MEETING OF THE AGARD FLUID DYNAMICS PANEL, 2-5 MAR, 1959, RHODE ST. GENESE, BELGIUM.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, MODEL TESTS), (*MODEL TESTS, INTERFERENCE), (*WIND TUNNELS, INTERFERENCE), WALLS, VERTICAL TAKE-OFF PLANES, LIFT, WINGS, CONFIGURATION, FLOW SEPARATION (U)

WIND-TUNNEL INVESTIGATIONS OF VTOL AND STOL AIRPLANE MODELS INVOLVE CONFIGURATIONS IN WHICH A LARGE AMOUNT OF POWER IS BEING USED TO GENERATE PART OF THE LIFT THROUGH THE MEDIUM OF PROPELLER SLIPSTREAMS OR JET EXHAUSTS DIRECTED DOWNWARD AT LARGE ANGLES TO THE FREE-STREAM DIRECTION. FOR MANY CONFIGURATIONS THE PROPELLERS OR JET EXHAUSTS ARE ARRANGED, FOR EXAMPLE, AS IN THE JET FLAP, TO COVER THE ENTIRE SPAN OF THE WING AND THUS TO ASSIST THE WIND IN ITS NATURAL PROCESS OF PRODUCING SO-CALLED 'CIRCULATION' LIFT. THIS ARRANGEMENT RESULTS IN THE STREAMLINES IN THE VICINITY OF THE WING ALSO BEING TURNED THROUGH LARGE ANGLES TO THE FREE-STREAM DIRECTION OF FLOW. THE PRESENCE OF THE TUNNEL WALLS, HOWEVER, IMPOSES THE CONDITIONS THAT THE STREAMLINES AT THE TUNNEL WALLS MUST BE PARALLEL TO THE FREE STREAM. THUS, THE PROBLEM OF TUNNEL-WALL EFFECTS IN VTOL-STOL MODEL TESTING IS SIMILAR TO THAT ASSOCIATED WITH CONVENTIONAL MODEL TESTING BUT DIFFERS GREATLY IN DEGREE. EXPERIENCE HAS SHOWN THAT, IN ADDITION TO THESE USUAL TUNNEL-WALL EFFECTS, FLOW SEPARATION ON THE MODEL CAN ALSO BE INDUCED BY THE TUNNEL WALLS. THE EXPERIENCES OF THE LANGLEY RESEARCH CENTER OF N.A.S.A. RELATED TO THESE PROBLEMS IN CLOSED-THROAT WIND TUNNELS ARE REVIEWED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-662 686 1/2
HARVARD UNIV CAMBRIDGE MASS DIV OF ENGINEERING AND APPLIED PHYSICS

CONJUGATE GRADIENT METHODS WITH AN APPLICATION TO V/STOL FLIGHT-PATH OPTIMIZATION. (U)

DESCRIPTIVE NOTE: INTERIM TECHNICAL REPT.,
NOV 67 36P MEHRA,R. K. ;BRYSON,A. E. , JR;
REPT. NO. TR-543
CONTRACT: N00014-67-A-0298-0006
PROJ: NR-372-012

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT PATHS), (*VERTICAL TAKE-OFF PLANES, FLIGHT PATHS), (*FLIGHT PATHS, OPTIMIZATION), ALGORITHMS, CONTROL, FLIGHT (U)

CONJUGATE GRADIENT METHODS HAVE RECENTLY BEEN APPLIED TO SOME SIMPLE OPTIMIZATION PROBLEMS AND HAVE BEEN SHOWN TO CONVERGE FASTER THAN THE METHODS OF STEEPEST DESCENT. THE PRESENT PAPER CONSIDERS APPLICATION OF THESE METHODS TO MORE COMPLICATED PROBLEMS INVOLVING TERMINAL AS WELL AS IN-FLIGHT CONSTRAINTS. A NUMBER OF METHODS ARE SUGGESTED TO HANDLE THESE CONSTRAINTS AND THE NUMERICAL DIFFICULTIES ASSOCIATED WITH EACH METHOD ARE DISCUSSED. THE PROBLEM OF FLIGHT-PATH OPTIMIZATION OF A V/STOL AIRCRAFT WAS CONSIDERED AND MINIMUM TIME PATHS FOR THE CLIMB PHASE WERE OBTAINED USING THE CONJUGATE GRADIENT ALGORITHM. IN CONCLUSION, SOME REMARKS ARE MADE ABOUT THE RELATIVE EFFICIENCY OF THE DIFFERENT OPTIMIZATION SCHEMES PRESENTLY AVAILABLE FOR THE SOLUTION OF OPTIMAL CONTROL PROBLEMS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-663 756 5/2 1/3
DAYTON UNIV OHIO RESEARCH INST

DEVELOPMENT AND EXPERIMENTAL EVALUATION OF A RETRIEVAL SYSTEM FOR AIR FORCE CONTROL-DISPLAY INFORMATION. (U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. 30 JUN 66-1 JUL 67,
NOV 67 177P DEBONS,ANTHONY ISCHEFFLER, FREDERIC L. ISNIDE,JOHN D. ;
CONTRACT: AF 33(615)-5310
PROJ: AF-6190
TASK: AF-619007
MONITOR: AFFDL TR-67-119

UNCLASSIFIED REPORT

DESCRIPTORS: (•INFORMATION RETRIEVAL, EFFECTIVENESS), (•SHORT TAKE-OFF PLANES, DOCUMENTATION), CLASSIFICATION, CONTROL SYSTEMS, DISPLAY SYSTEMS, AIR FORCE EQUIPMENT, VERTICAL TAKE-OFF PLANES
IDENTIFIERS: COORDINATE INDEXING, THESAURI (U)
(U)

A PROPOSED CLASSIFICATION SYSTEM WAS STUDIED TO DETERMINE ITS EFFICACY TO THE AIR FORCE CONTROL-DISPLAY AREA. BASED ON NEGATIVE OUTCOMES FROM A LOGICAL ASSESSMENT OF THE PROPOSED SYSTEM, AN ALTERNATE SYSTEM WAS PROPOSED TO INCLUDE THE COORDINATE INDEX CONCEPT. UPON DEVELOPMENT OF A THESAURUS AND AN INDEX SYSTEM ON 106 DOCUMENTS IN THE VSTOL/VTOL AREA, AN EXPERIMENT WAS CONDUCTED TO DETERMINE THE ACCEPTANCE AND EFFECTIVENESS OF THE SYSTEM ON PROFESSIONAL WORKERS USING THE SYSTEM. FINDINGS REVEALED THAT THE COORDINATE SYSTEM WAS ACCEPTABLE TO THE USER AND THAT IT PROVIDED FOR THE RETRIEVAL OF RELEVANT DOCUMENTS BEYOND THAT EXPECTED BY CHANCE. THE STUDY SUGGESTS THAT THE COORDINATE INDEX SYSTEM AND THE PRESENT MEASURES USED TO STUDY ITS EFFECTIVENESS PROVIDE A RATIONALE FOR FURTHER EXPERIMENTATION WHICH CAN EXPAND THE BASE OF THE SYSTEM TO MEET THE NEED OF THE CONTROL-DISPLAY AREA. (AUTHOR)
(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOHC8

AD-664 155 1/2 1/3
AVIATION SAFETY ENGINEERING AND RESEARCH PHOENIX ARIZ

U. S. ARMY AC-1 DE HAVILLAND 'CARIBOU' EVALUATION, FT. RUCKER, ALABAMA, 21 JANUARY 1960. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
OCT 60 65P BRUGGINK,GERARD M. ICARROLL, JACK ;KNOWLES,WILLIAM R. ;
CONTRACT: DA-44-177-TC-624
MONITOR: TRECOM TR-60-62

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON CRASH INJURY EVALUATION.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AVIATION ACCIDENTS), (•TRANSPORT PLANES, CRASH INJURIES), AVIATION SAFETY, LANDING GEAR, DESCENT, SAFETY HARNESS, HAZARDS, HATCHES, MILITARY REQUIREMENTS, ARMY AIRCRAFT, TACTICAL AIR SUPPORT, AIRMOBILE OPERATIONS (U)
IDENTIFIERS: C-7 AIRCRAFT, CRASHWORTHINESS (U)

THE CRASH INJURY EVALUATION OF THE U. S. ARMY AC-1 DH 'CARIBOU' DISCLOSED SEVERAL DESIRABLE CRASH SAFETY FEATURES INCLUDING A LIMIT LANDING GEAR STRENGTH WHICH PERMITS A VERTICAL RATE OF DESCENT OF 14 FEET PER SECOND; THE LOCATION OF THE FUEL CELLS OUTBOARD OF THE ENGINE NACELLES; TROOP SEAT BELT ANCHORAGES WHICH ARE DIRECTLY SECURED TO BASIC AIRCRAFT STRUCTURE. ATTENTION IS INVITED TO THE REMEDIAL ACTION SUGGESTED IN THE RECOMMENDATIONS PERTAINING TO THESE DEFICIENCIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOR

AD-665 425 1/3
NORTHROP CORP HAWTHORNE CALIF NORAIR DIV

V/STOL GROUND-BASED SIMULATION TECHNIQUES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 27 JUN 66-27 MAY 67,
NOV 67 73P SINACORI,J. B. !
REPT. NO. NOR-67-85
CONTRACT: DA-44-177-AMC-462(T)
PROJ: DA-1F125901A142
TASK: 1F125901A14233
MONITOR: USAAVLABS TR-67-55

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, •RESEARCH PLANES), (•SHORT TAKE-OFF PLANES, FLIGHT SIMULATORS), JET PLANES, PILOTS, LIFT, VISUAL PERCEPTION, DISPLAY SYSTEMS, HOVERING, ROLL, COCKPITS, PERFORMANCE(HUMAN), PERFORMANCE(ENGINEERING), FLIGHT TESTING, MOTION, FLIGHT CONTROL SYSTEMS, VERTIGO (U)
IDENTIFIERS: X-14 AIRCRAFT, X-14A AIRCRAFT (U)

A STUDY OF VARIOUS KINDS OF SIMULATORS HAS BEEN MADE TO DETERMINE THEIR CAPABILITY TO PRODUCE DATA REPRESENTATIVE OF VISUAL FLIGHT. FOUR SIMULATIONS OF A JET-LIFT V/STOL AIRCRAFT WERE CONDUCTED USING THE SAME PILOT. CONTROL CHARACTERISTICS AND AIRFRAME PARAMETERS WERE MAINTAINED CONSTANT (AS CLOSELY AS POSSIBLE), AND THE SAME TASKS WERE USED BY THE PILOT IN EACH EVALUATION. THE RESULTING DATA WERE COMPARED WITH FLIGHT RESULTS FROM THE SAME AIRCRAFT. THE SIMULATORS USED DIFFERENT DISPLAYS, MOTION MODES, AND INSTRUMENTATION, AND THE RESULTS ARE DISCUSSED IN THE LIGHT OF THE CHARACTERISTICS OF EACH SIMULATOR. THE RESULTS SHOW CLEARLY THAT IN ORDER TO PRODUCE QUANTITATIVE DATA REPRESENTATIVE OF FLIGHT RESULTS, THE DISPLAY MUST HAVE A QUALITY LEVEL COMPATIBLE WITH THE TASK BEING PERFORMED. SPECIFICALLY, A PRECISION HOVERING TASK REQUIRES A HIGH RESOLUTION DISPLAY, WHILE A TRANSLATION (OR TRANSITION TASK) CAN BE PERFORMED WITH A DISPLAY OF MUCH LESS RESOLUTION. THE DISPLAY CONTENT IS IMPORTANT, PARTICULARLY FOR THE PRECISION HOVERING TASK WHERE HEIGHT HOLDING IS REQUIRED. FOR FLIGHT SIMULATION OF LARGE TRANSLATIONAL MOVEMENTS, COCKPIT MOTION DID NOT APPEAR TO AFFECT THE RESULTS! (U)

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-667 427 1/3 20/4 1/1
AIR VEHICLE CORP LA JOLLA CALIF

LINEARIZED INVISCID-FLOW THEORY OF TWO-DIMENSIONAL THIN JET PENETRATION INTO A STREAM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 68 24P STRAND,T. ;WEI,M. H. Y.
;
REPT. NO. 355
CONTRACT: DA-31-124-ARO(D)-311
MONITOR: AROD 5274:4-E

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, JET MIXING FLOW), TWO-DIMENSIONAL FLOW, JETS, PENETRATION, LINEAR SYSTEMS, VERTICAL TAKE-OFF PLANES, INTERFACES, INJECTION, THRUST REVERSE, THEORY, GROUND EFFECT (U)
IDENTIFIERS: INVISCID FLOW, JET IMPINGEMENT (U)

THE POTENTIAL FLOW OF A STREAM THAT INTERACTS WITH A TWO-DIMENSIONAL THIN JET OF A DIFFERENT TOTAL HEAD, BEING INJECTED INTO THE STREAM FROM AN INFINITE PLANE SURFACE AT AN ARBITRARY ANGLE, IS ANALYZED USING NATURAL COORDINATES. THE VELOCITY MAGNITUDES ALONG THE INTERFACE AND THE NONDIMENSIONAL SHAPE OF THE INTERFACE BETWEEN THE JET AND THE STREAM ARE OBTAINED AS FUNCTIONS OF THE INJECTION ANGLE AND THE RATIO OF THE FREE STREAM VELOCITY TO THE VELOCITY IN THE JET AT INFINITY DOWNSTREAM. RESULTS ARE PRESENTED FOR SEVERAL CASES WHEN THE JET ISSUES AT OBLIQUE ANGLES FROM THE SURFACE, AND ALSO FOR THE LIMITING CASE WHEN THE JET OPPOSES THE FREE STREAM. THE LATTER CASE CORRESPONDS TO THE FLOW DUE TO ONE BRANCH OF A TRANSLATING TWO-DIMENSIONAL JET AFTER THE JET HAS BEEN SPLIT INTO TWO BRANCHES BY IMPINGEMENT ON THE GROUND. IT MIGHT ALSO CORRESPOND TO THE FLOW OF A TWO-DIMENSIONAL THRUST REVERSER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDH08

AD-667 924 1/3 1/2 17/2
BUNKER-RAMO CORP CANOGA PARK CALIF

ARMY AIRCRAFT VOICE-WARNING SYSTEM STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 10 AUG 67-10 JAN 68,
FEB 68 230P BROWN,JAMES E. !BERTONE,
CARMINE M. !OBERMAYER,RICHARD W. !
REPT. NO. G0131-8U1
CONTRACT: DAAD05-68-C-0025
MONITOR: HEL TM-6-68

UNCLASSIFIED REPORT

DESCRIPTORS: (*HELICOPTERS, EARLY WARNING SYSTEMS), (*SHORT TAKE-OFF PLANES, EARLY WARNING SYSTEMS), (*EARLY WARNING SYSTEMS, *VOICE COMMUNICATION SYSTEMS), ARMY AIRCRAFT, OBSERVATION PLANES, PILOTS, MALFUNCTIONS, COCKPITS, AVIATION ACCIDENTS, HUMAN ENGINEERING, STATISTICAL ANALYSIS, DISPLAY SYSTEMS, AUDITORY SIGNALS, INSTRUMENT PANELS, MISSION PROFILES, JOB ANALYSIS, QUESTIONNAIRES (U)

IDENTIFIERS: *VOICE-WARNING SYSTEMS, UH-1B AIRCRAFT, UH-1D AIRCRAFT, AH-1G AIRCRAFT, H-47 AIRCRAFT, CH-47 AIRCRAFT, H-54 AIRCRAFT, CH-54 AIRCRAFT, V-1 AIRCRAFT, OV-1 AIRCRAFT, H-1 AIRCRAFT (U)

THE REPORT DESCRIBES AN ANALYTICAL STUDY THAT WAS INTENDED TO SERVE AS A BASIS FOR THE APPLICATION OF VOICE-WARNING SYSTEMS (VWS) FOR THE UH-1B AND UH-1D (HUEY), AH-1G (COBRA), CH-47 (CHINOOK), CH-54 (SKYCRANE), AND OV-1 (MOHAWK). THE FOLLOWING PROBLEMS OF INSTALLING A VWS IN THESE ARMY AIRCRAFT WERE STUDIED: (1) THE IDENTIFICATION AND SELECTION OF MESSAGES FOR MAXIMUM EFFECTIVENESS; (2) THE DETERMINATION OF PRIORITY SEQUENCES; AND (3) THE INTEGRATION OF THE VWS INTO EXISTING COCKPITS. THE STUDY INVOLVED THE COLLECTION OF BASIC DATA AND THE CONDUCT AND VALIDATION OF MISSION ANALYSES, OPERATIONAL SEQUENCE DIAGRAMS, TASK ANALYSES, AIRCRAFT CONFIGURATION ANALYSES, PILOT OPINION SURVEYS, AND ARMY AIRCRAFT ACCIDENT ANALYSES. IN THE REPORT, PRIORITY SEQUENCES ARE DERIVED FOR ALL MAJOR EMERGENCIES FOR THE SIX VEHICLES; FURTHER ANALYTICAL EFFORT IS DESCRIBED WHICH REDUCED THE LIST TO 20 MESSAGES FOR INCLUSION IN THE VWS. FOR EACH AIRCRAFT, 2 LISTS OF 20 MESSAGES ARE PROPOSED; (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-670 006 1/2 17/7
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J

VTOL AND STOL SIMULATION STUDY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
APR 68 54P CONWAY,ROBERT C. !
REPT. NO. NA-68-21
PROJ: 150-533-01X
MONITOR: FAA-RD 67-68

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR TRAFFIC CONTROL TERMINAL AREAS, SIMULATION), (*VERTICAL TAKE-OFF PLANES, AIRCRAFT LANDINGS), (*SHORT TAKE-OFF PLANES, AIRCRAFT LANDINGS), AIR TRAFFIC CONTROL SYSTEMS, GROUND SPEED, SIMULATORS, SEPARATION, RUNWAYS, APPROACH, NAVIGATIONAL AIDS, TERMINAL FLIGHT FACILITIES (U)

A SIMULATION STUDY TO DETERMINE THE EFFECT ON AIR TRAFFIC CONTROL WHEN BOTH VERTICAL AND SHORT TAKEOFF AND LANDING AIRCRAFT ARE INTRODUCED INTO A TERMINAL AIR TRAFFIC CONTROL ENVIRONMENT WAS CONDUCTED. THE SIMULATION WAS CONDUCTED USING THE MODEL B DYNAMIC AIR TRAFFIC CONTROL SIMULATOR. SEVERAL APPROACH CONDITIONS, VARIOUS GLIDE SLOPE ANGLES, AND SEPARATION CRITERIA WERE INVESTIGATED TO DETERMINE THE EFFECT ON A TERMINAL ENVIRONMENT. IT WAS CONCLUDED THAT VERTICAL AND SHORT TAKEOFF AND LANDING AIRCRAFT COULD BE ACCOMMODATED IN THE TERMINAL AREA USING PRESENT OPERATIONAL PROCEDURES AS CONTAINED IN THE TERMINAL AIR TRAFFIC CONTROL MANUAL 7110.8. HOWEVER, WHEN VERTICAL AND SHORT TAKEOFF AND LANDING AIRCRAFT REDUCED FROM TERMINAL AREA SPEED TO A SLOW FINAL APPROACH SPEED, DIFFICULTIES WERE ENCOUNTERED IN PROVIDING NOT ONLY THE DESIRED SPACING BETWEEN THESE AIRCRAFT BUT BETWEEN THESE AIRCRAFT AND CONVENTIONAL AIRCRAFT IN THE SEQUENCE TO AND ON THE FINAL APPROACH COURSE. THESE PROBLEMS DID NOT EXIST WHEN VERTICAL AND SHORT TAKEOFF AND LANDING AIRCRAFT USED A FINAL APPROACH SPEED COMPATIBLE WITH THAT OF CONVENTIONAL AIRCRAFT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-677 079 1/2 1/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY VTOL AIRCRAFT. VOLUME I: SUMMARY AND METHOD. (U)

AUG 66 75P ASHER,NORMAN J. ;WETZLER, ELLIOT ;HOROWITZ,SEYMOUR M. ;SCHNEIDER,W. BARTZ ;
REPT. NO. R-144-VOL-1
MONITOR; IDA/HQ 68-8872

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-677 080.

DESCRIPTORS: (*TRANSPORT PLANES, SHORT TAKE-OFF PLANES), (*VERTICAL TAKE-OFF PLANES, *CIVIL AVIATION), AIR TRANSPORTATION, COSTS, PREDICTIONS, HELICOPTERS, TILT WINGS, HELICOPTER ROTORS, AIRCRAFT SEATS, DESIGN, AIR TRAFFIC, URBAN AREAS (U)
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING AIRCRAFT, *PASSENGER TRANSPORTATION (U)

AIRCRAFT DEMAND AND COST FUNCTIONS WERE ESTIMATED FOR SIX TYPES OF VTOL AIRCRAFT: CONVENTIONAL HELICOPTER, COMPOUND HELICOPTER, TILT ROTOR, TILT WING, STOWED ROTOR, AND FAN OR JET LIFT. FROM THESE FUNCTIONS TOTAL AIRCRAFT PROFIT OR LOSS AS A FUNCTION OF THE NUMBER OF AIRCRAFT PRODUCED WAS CALCULATED. RESULTS WERE CALCULATED FOR THE 90 SEAT SIZE OF ALL SIX TYPES; IN ADDITION, 30, 60, 120 AND 150 SEAT SIZES WERE ANALYZED FOR THE FAN OR JET LIFT TYPE. THE AIRCRAFT DEMAND WAS CALCULATED SEPARATELY FOR EACH DOMESTIC CITY PAIR AND THEN SUMMED TO OBTAIN TOTAL DOMESTIC DEMAND. THE DOMESTIC DEMAND WAS THEN INCREASED BY A CONSTANT RATIO TO ACCOUNT FOR EXPORT SALES. DEMAND IS BASED ON AIR TRAFFIC FOR 1985, THE ESTIMATED FINAL YEAR OF PRODUCTION FOR THESE FIRST GENERATION INTERCITY VTOL AIRCRAFT. VOLUME III PRESENTS GENERALIZED AIRCRAFT DEMAND BY CITY PAIR AS A FUNCTION OF VTOL AIRCRAFT FARE, BLOCK TIME AND NUMBER OF SEATS. WITH THESE DATA, THE USER OF THE REPORT CAN DETERMINE THE DEMAND FOR ANY VTOL PASSENGER TRANSPORT DESIGN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM06

AD-677 080 1/2 1/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY VTOL AIRCRAFT. VOLUME II: APPENDICES. (U)

AUG 68 216P ASHER,NORMAN J. ;WETZLER, ELLIOT ;HOROWITZ,SEYMOUR M. ;SCHNEIDER,W. BARTZ ;

REPT. NO. R-144-VOL-2
MONITOR; IDA/HQ 68-8873

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3. AD-677 081.

DESCRIPTORS: (•TRANSPORT PLANES, SHORT TAKE-OFF PLANES), (•VERTICAL TAKE-OFF PLANES, •CIVIL AVIATION), AIR TRANSPORTATION, HELICOPTERS, COSTS, AIR TRAFFIC, TILT WINGS, HELICOPTER ROTORS, ECONOMICS, TIME, DESIGN, AIRPORTS, STATISTICAL ANALYSIS, URBAN AREAS (U)
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING AIRCRAFT, •PASSENGER TRANSPORTATION, INVESTMENT RETURNS (U)

CONTENTS: AIRCRAFT CHARACTERISTICS; DISTRIBUTION OF LOCAL ORIGINS AND DESTINATIONS; GROUND TRANSPORTATION TIME AND COST TO THE AIRPORT; AIRCRAFT COSTS; RATE OF RETURN ON INVESTMENT; AIRCRAFT LOAD FACTOR; NONPASSENGER REVENUE; CALCULATION OF AIRCRAFT FARES; COMPARATIVE COST ESTIMATES OF VERTIPORTS AND AIRPORTS; DERIVATION OF PASSENGERS' VALUE OF TIME RELATIVE TO INCOME FROM THE 1963 CENSUS OF TRANSPORTATION; VTOL STIMULATION OF AIR TRAVEL; LOCATION OF AIRPORTS AND VERTIPORTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-677 081 1/2 1/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY VTOL AIRCRAFT. VOLUME III: GENERALIZED AIRCRAFT DEMAND BY CITY PAIR, (U)

AUG 68 205P ASHER,NORMAN J. ;WETZLER, ELLIOT ;HOROWITZ,SEYMOUR M. ;SCHNEIDER,W. BARTZ ;
REPT. NO. R-144-VOL-3
MONITOR; IDA/HQ 68-8874

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 4, AD-677 082.

DESCRIPTORS: (•TRANSPORT PLANES, SHORT TAKE-OFF PLANES), (•VERTICAL TAKE-OFF PLANES, •CIVIL AVIATION), AIR TRANSPORTATION, AIR TRAFFIC, HELICOPTERS, TILT WINGS, HELICOPTER ROTORS, COSTS, STATISTICAL DATA, TABLES, URBAN AREAS (U)
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING AIRCRAFT, •PASSENGER TRANSPORTATION (U)

FOR EACH CITY PAIR, RANGES OF VTOL BLOCK TIMES AND FARES WERE ASSUMED AND FOR EACH COMBINATION OF FARE AND BLOCK TIME THE NUMBER OF VTOL PASSENGERS BEFORE AND AFTER VTOL SPEED STIMULATION WERE CALCULATED, THEN FOR EACH FARE AND BLOCK TIME COMBINATION, THE NUMBER OF AIRCRAFT REQUIRED TO CARRY THE VTOL PASSENGERS (AFTER SPEED STIMULATION) WAS CALCULATED FOR A VARIETY OF AIRCRAFT SEATING CAPACITIES, AND THE ASSOCIATED DAILY ROUND-TRIP FREQUENCY WAS PRESENTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM08

AD-677 082 1/2 1/3
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM ANALYSIS DIV

THE DEMAND FOR INTERCITY PASSENGER TRANSPORTATION BY VTOL AIRCRAFT. VOLUME IV: SPECIFIC AIRCRAFT DEMAND BY CITY PAIR. (U)

AUG 68 112P ASHER,NORMAN J. ;WETZLER, ELLIOT ;HOROWITZ,SEYMOUR M. ;SCHNEIDER,W. BARTZ ;
REPT. NO. R-144-VOL-4
MONITOR: IDA/HQ 68-8875

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME I, AD-677 079.

DESCRIPTORS: (*TRANSPORT PLANES, SHORT TAKE-OFF PLANES), (*VERTICAL TAKE-OFF PLANES, *CIVIL AVIATION), AIR TRANSPORTATION, AIR TRAFFIC, HELICOPTERS, TILT WINGS, HELICOPTER ROTORS, COSTS, STATISTICAL DATA, TABLES, URBAN AREAS, REGRESSION ANALYSIS (U)
IDENTIFIERS: COMPOUND HELICOPTERS, ROTOR-WING AIRCRAFT, *PASSENGER TRANSPORTATION (U)

IN ORDER TO ACCOMPLISH RAPID MASS CALCULATION OF DEMAND FOR MANY COMBINATIONS OF AIRCRAFT TYPE AND AIRCRAFT PRICE, THE GENERALIZED CITY-PAIR RESULTS OF VOLUME III (AD-677 081) WERE USED TO DEVELOP INDIVIDUAL CITY-PAIR REGRESSION EQUATIONS. THESE REGRESSION EQUATIONS MAKE VTOL PASSENGER DEMAND AFTER STIMULATION A FUNCTION OF FARE (WHICH VARIES DIRECTLY WITH AIRCRAFT PRICE) AND BLOCK TIME (WHICH VARIES DIRECTLY WITH AIRCRAFT TYPE). THE COEFFICIENTS OF THESE REGRESSION EQUATIONS ARE ONE OF THE SET OF INPUTS REQUIRED IN COMPUTER PROGRAM AIRDEMAN TO CALCULATE AIRCRAFT DEMAND FOR ALL 86 CITY PAIRS. PASSENGER DEMAND IS TRANSLATED INTO AIRCRAFT DEMAND BY THE SAME GENERAL CONVERSION FORMULA THAT IS USED IN VOLUME III. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-684 964 1/3 20/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF MECHANICAL ENGINEERING

NOISE STUDIES FROM THE FAN-IN-WING MODEL. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,
JUN 68 21P KRISHNAPPA,G.
MONITOR: NAE,NRC LR-508,10605

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, DUCTED FANS), (•DUCTED FANS, •PROPELLER NOISE), SOUND, PROPAGATION, ACOUSTICS, HARMONIC ANALYSIS, PROPELLER BLADES, TURBINE STATORS, INTERACTIONS, TURBULENCE (U)
IDENTIFIERS: BROADBAND ACOUSTIC NOISE, •LIFT FANS (U)

SOME PRELIMINARY MEASUREMENTS OF NOISE FROM A HIGHLY LOADED FAN-IN-WING CONFIGURATION ARE REPORTED. MEASUREMENTS OF THE SPECTRA ARE PRESENTED FOR FAN SPEEDS OF 7500, 9750, AND 13,125 RPM (CORRESPONDING TO TIP MACH NUMBER 0.35, 0.45, AND 0.62) AT AN ANGLE OF 20 DEG. FROM THE AXIS OF THE FAN AND AT 5 FT FROM THE INLET AND EFFLUX FACES OF THE FAN. THE EXPERIMENTAL RESULTS SHOW A DISCRETE PEAK AT BLADE-PASSING FREQUENCY, SUPERIMPOSED ON A BROAD BAND NOISE THAT EXTENDS FROM 1000 C/S TO 15,000 C/S. AN ANALYSIS OF THE DUCT TRANSMISSION OF HIGHER ORDER MODES AT THE ABOVE ROTATIONAL SPEEDS REVEALS HIGH DECAY RATES. THIS EXPLAINS THE ABSENCE OF DISCRETE TONES AT THE HARMONICS OF THE BLADE-PASSING FREQUENCIES. THE FRESENCE OF HIGH INTENSITY BROAD BAND NOISE MAY BE ATTRIBUTED TO THE TURBULENCE IN THE WAKE AND FREE STREAM TURBULENCE AHEAD OF THE ROTOR BLADES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-685 610 20/1 1/3
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF NOISE ABATEMENT

CONFERENCE ON STOL TRANSPORT AIRCRAFT NOISE CERTIFICATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.
JAN 69 176P
REPT. NO. FAA-NO-69-1
PROJ: FAA-550-003-03H

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PROCEEDINGS OF THE INDUSTRY/ GOVERNMENT CONFERENCE ON STOL TRANSPORT AIRCRAFT NOISE CERTIFICATION (1ST), WASHINGTON, D. C., 30 JAN 69.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •NOISE), (•TRANSPORT PLANES, AIRPLANE NOISE), DESIGN, ENGINE NOISE, PROPELLER NOISE, AIR TRAFFIC CONTROL SYSTEMS, ECONOMICS, SHROUDED PROPELLERS, SYMPOSIA (U)
IDENTIFIERS: LIFT FANS, NOISE REDUCTION (U)

THE PROCEEDINGS OF THE CONFERENCE INCLUDED PAPERS ON STOL DEVELOPMENT, STOL NOISE SOURCES, STOL NOISE ABATEMENT OPERATIONS, AND AIRCRAFT NOISE EVALUATION AND ARE ASSEMBLED FOR USE IN FUTURE ACTIVITIES RELATED TO STOL NOISE CERTIFICATION. EXAMPLES AND FIGURES ARE GIVEN ILLUSTRATING REPRESENTATIVE STOL CONFIGURATIONS AND ASSOCIATED NOISE CHARACTERISTICS AS WELL AS STOL PORT DESIGNS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-686 280 13/7 13/11 1/3
HARRY DIAMOND LABS WASHINGTON D C

FLUIDIC GAS DIVERTER VALVES, (U)

FEB 69 41P HOLMES,ALLEN B. ;GEHMAN, STACY E. ;
REPT. NO. HDL-TR-1427
PROJ: DA-1-P-125901-A-014; HDL-45140
TASK: 1-P-125901-A01409

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLUIDICS, *BUTTERFLY VALVES), (*SHORT TAKE-OFF PLANES, JET ENGINE VALVES), EXHAUST GASES, MODEL TESTS, TURBULENCE, THRUST, DEFLECTION (U)
IDENTIFIERS: V-S AIRCRAFT (U)

A V/STOL CONFIGURATION USING TURBOJET EXHAUST FOR HOVERING AND JET THRUST FOR PROPULSION REQUIRES THE USE OF HIGH-CAPACITY DIVERTER VALVES. A STUDY WAS CONDUCTED TO INVESTIGATE THE APPLICATION OF FLUIDIC PRINCIPLES TO V/STOL DIVERTER VALVE DESIGN. DURING THE PROGRAM, THREE SUBSCALE VALVES WERE BUILT AND TESTED. EACH VALVE HAS TWO OUTPUTS, ONE FEEDING A SIMULATED TAIL EXHAUST PIPE AND ONE EXHAUSTING DIRECTLY TO ATMOSPHERE. THE OPERATION OF EACH VALVE DEPENDS UPON THE VISCOUS INTERACTION BETWEEN A TURBULENT FLOW AND A WALL. THE OBJECTIVE IS TO ESTABLISH THE FLOW DIVERSION CAPABILITIES AND JET MODE THRUST PERFORMANCE OF EACH MODEL. FLOW TESTS WERE CONDUCTED USING COMPRESSED AIR AT FLOW RATES RANGING TO 3000 CFM AT 30 PSI. THE IMPULSE DELIVERED AT THE OUTPUT OF EACH VALVE WAS MEASURED IN TERMS OF THE DEVELOPED THRUST PER UNIT MASS FLOW OVER A RANGE OF SUPPLY PRESSURES. DATA REPRESENTING THE RATIO BETWEEN DELIVERABLE IMPULSE AND ISENTROPIC IMPULSE ARE INCLUDED TO PROVIDE A MEANS FOR COMPARING THE DESIGNS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-687 167 1/3
POLITECNICO DI TORINO (ITALY) ISTITUTO DI PROGETTO DI AEROMOBILI

PARAMETRIC INVESTIGATION OF STOL AIRCRAFT. (U)

JUN 68 73P GABRIELLI,GIUSEPPE ;
REPT. NO. PUB-12
MONITOR: AGARD OGRAPH-46

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SYMPOSIUM ON VERTICAL AND SHORT TAKE-OFF AND LANDING AIRCRAFT, PARIS, JUN 68, PT1 P1-140.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), TAKE-OFF, AIRCRAFT LANDINGS, AIRCRAFT ENGINES, AERODYNAMIC CHARACTERISTICS, TURBOFAN ENGINES, AVIATION SAFETY, COSTS, ITALY (U)

THE PARAMETRIC INVESTIGATION CONSISTS OF THE EVALUATION OF THE MINIMUM TAKE-OFF AND LANDING LENGTHS, AS AFFECTED BY SOME PARAMETERS (WING LOADING, MAXIMUM LIFT COEFFICIENT, ENGINE THRUST TO AIRCRAFT A.U.W. RATIO, THRUS DEFLECTION ANGLE), FOR A JET PROPELLED STOL AIRCRAFT CAPABLE OF COMPLYING WITH ANY OTHER REQUIREMENT OF G.O.R. 2 (INCLUDING MISSION PROFILE, MILITARY LOADS, ETC.). THE TAKE-OFF PERFORMANCES ARE EVALUATED UNDER THE BASIC ASSUMPTIONS THAT THE TAKE-OFF FROM THE GROUND IS OBTAINED MAINLY THROUGH THE AERODYNAMIC LIFT OF A WING PROVIDED WITH HIGH LIFT DEVICES AND THAT THE AIRCRAFT IS MAINLY CONTROLLED DURING TAKE-OFF BY CONVENTIONAL AERODYNAMIC MEANS. AIRCRAFT WITH GEOMETRICALLY SIMILAR WINGS ARE CONSIDERED (THAT IS, HAVING IDENTICAL WING SECTIONS, PLANFORM, SWEEP-BACK ANGLE, ETC.). THE WING SHAPE WAS SELECTED. AIRCRAFT POWERED BY TWO DIFFERENT PROPULSION SYSTEMS ARE CONSIDERED AND COMPARED. THE FIRST PROPULSION SYSTEM CONSISTS OF A SINGLE HIGH BY-PASS AND MEDIUM COMPRESSION RATIO TURBOFAN ENGINE PROVIDED WITH SWIVELLING PROPELLING NOZZLES. THE ALTERNATE IS A COMPOSITE SYSTEM, CONSISTING OF A SINGLE MEDIUM BY-PASS AND HIGH COMPRESSION RATIO TURBOJET ENGINE GIVING HORIZONTAL THRUST AND OF TWO, OR MORE, BOOSTER TURBOJETS, TO BE USED DURING TAKE-OFF ONLY, HAVING A LOW COMPRESSION RATIO AND PROVIDED WITH PROPELLING NOZZLES WHICH MAY BE DEFLECTED DOWNWARDS AT DIFFERENT ANGLES.

(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-688 921 1/3 1/1
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

THE AERODYNAMICS OF V/STOL AIRCRAFT. (U)

MAY 68 496P
REPT. NO. AGARDOGRAPH-124

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. PRESENTED AT A LECTURE SERIES HELD AT THE INSTITUTE, RHODE-SAINT-GENESE (BELGIUM), 13-17 MAY 68.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (•VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), GROUND EFFECT, HOVERING, INTERACTIONS, GROUND EFFECT MACHINES, HELICOPTERS, SHROUDED PROPELLERS, SHROUD RINGS, DUCTED FANS, TURBOJET ENGINES, TURBOFAN ENGINES, LIFT, AIRCRAFT LANDINGS, TAKE-OFF, FLIGHT TESTING, BOUNDARY LAYER CONTROL SYSTEMS, SYMPOSIA (U)
IDENTIFIERS: LIFT FANS, TILT WINGS, TILT ROTORS (U)

THE PUBLISCTION CONTAINS THE LECTURE NOTES PREPARED FOR THE AGARD-VKI LECTURE SERIES ON 'THE AERODYNAMICS OF V/STOL, AIRCRAFT' WHICH TOOK PLACE AT THE VON KARMAN INSTITUTE, RHODE-SAINT GENESE, BELGIUM, FROM MAY 13 TO 17, 1968. THE LECTURE SERIES WAS DESIGNED TO PROVIDE AN UP-TO-DATE ACCOUNT OF SPECIAL AERODYNAMIC PROBLEMS AND AERODYNAMIC REQUIREMENTS FOR V/STOL AIRCRAFT, INCLUDING A DISCUSSION OF THE PRESENT STATE OF KNOWLEDGE, NOVEL AERODYNAMIC ADVANCES, IMPORTANT AREAS FOR RESEARCH AND DEVELOPMENT, EXPERIMENTAL AND THEORETICAL TREATMENTS AS WELL AS IMMEDIATE AND LONG-TERM V/STOL AIRCRAFT PROSPECTS. IT WAS INTENDED FOR AERONAUTICAL ENGINEERS WITH A NEED TO ACQUIRE A MORE ADEQUATE BACKGROUND ON V/STOL AERODYANMICS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-689 106 1/2
FEDERAL AVIATION ADMINISTRATION OKLAHOMA CITY OKLA NATIONAL FLIGHT INSPECTION DIV

EVALUATION OF MDC/EAL STOL DEMONSTRATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAY 69 113P BRYANT,BARNEY B. ;PARR, FRANK ;
PROJ: FAA-68-460-3

UNCLASSIFIED REPORT
PORTIONS OF THIS DOCUMENT ARE ILLEGIBLE. SEE INTRODUCTION SECTION OF THIS ANNOUNCEMENT JOURNAL FOR CFSTI ORDERING INSTRUCTIONS.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •FLIGHT PATHS); (•AIR TRAFFIC CONTROL TERMINAL AREAS, AIR TRAFFIC), TRANSPORT PLANES, MANEUVERABILITY, NEW YORK, SCHEDULING, TURNING FLIGHT (U)
IDENTIFIERS: BREGUET 941 AIRCRAFT, EVALUATION (U)

DATA WERE COLLECTED DURING A DEMONSTRATION OF THE BREGUET STOL TRANSPORT AIRCRAFT IN THE NEW YORK CITY AREA. ANALYSIS OF DATA WAS DIRECTED TO THE TERMINAL AREA MANEUVERING REQUIREMENTS. TURNING RADII FOR 80 KNOTS IAS WITH A 15 DEGREE BANK ANGLE APPEARED CORRECT FOR USE AS A MINIMUM STANDARD IN THE DEVELOPMENT OF DEPARTURE ROUTES AND HOLDING PATTERNS. THE ANGLE BETWEEN SUCCESSIVE ROUTE SEGMENTS LIMITS THE MINIMUM DISTANCE BETWEEN THE WAY-POINTS USED TO ESTABLISH THE INTERCEPTED SEGMENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-690 041 1/3 20/4 1/1
GEORGIA INST OF TECH ATLANTA

EXPERIMENTAL AND ANALYTICAL INVESTIGATIONS OF JETS EXHAUSTING INTO A DEFLECTING STREAM, (U)

69 19P MOSHER,D. K. ;WU,J. C. ;
WRIGHT,M. A. ;
CONTRACT: DA4C04-68-C-0004
MONITOR: AROD T-2;2-E

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AIAA/AHS VTOL RESEARCH, DESIGN, AND OPERATIONS MEETING, GEORGIA INST. OF TECH., ATLANTA, 17-19 FEB 69. PAPER 69-223.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), LIFT, JETS, INTERFERENCE, EXHAUST GASES, DEFLECTION, MASS TRANSFER, FLAT PLATE MODELS
(U)

A CIRCULAR JET ISSUING NORMALLY FROM AN INFINITE FLAT PLATE INTO A DEFLECTING STREAM IS TREATED BY THE USE OF A POTENTIAL FLOW MODEL WHICH REPRESENTS THE FLOW FIELD SURROUNDING THE JET; EXCLUSIVE OF THE WAKE. THE RESULTS INDICATE THAT THE ENTRAINMENT OF DEFLECTING-STREAM FLUID INTO THE JET IS IMPORTANT IN DETERMINING THE PLATE PRESSURE AND THAT, FOR THE CASE WHERE THE JET SPEED IS MUCH HIGHER THAN THE DEFLECTING-STREAM SPEED, IT IS POSSIBLE TO USE A TWO-DIMENSIONAL REPRESENTATION. THE CALCULATED PLATE PRESSURE DISTRIBUTION IS COMPARED WITH RESULTS OF EXPERIMENTS. EXPERIMENTAL RESULTS (FLOW VISUALIZATION, PLATE PRESSURE, AND VELOCITY MEASUREMENTS) ARE PRESENTED FOR CIRCULAR AS WELL AS NON-CIRCULAR JETS EXHAUSTING AT VARIOUS JET VELOCITIES FROM A LARGE FLAT PLATE. RESULTS INDICATE THAT A STREAM-WISE JET EXIT CONFIGURATION IS DESIRABLE. (AUTHOR)
(U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-691 220 1/3
STEVENS INST OF TECH HOBOKEN N J DAVIDSON LAB

MODEL TESTS OF THE LOCKHEED AIR-SEA CRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUL 69 69P FRIDSMA,GERARD ;
REPT. NO. 1381
CONTRACT: N00014-67-A-0202

UNCLASSIFIED REPORT

DESCRIPTORS: (*SEAPLANES, HYDRODYNAMICS), (*ANTISUBMARINE AIRCRAFT, SEAPLANES), (*SHORT TAKE-OFF PLANES, SEAPLANES), MODEL TESTS, PLANING SURFACES, SCALE, TAKE-OFF, AIRCRAFT LANDINGS, WATER WAVES, HYDRODYNAMIC CONFIGURATIONS, ANGLE OF ATTACK, YAW, LOADING(MECHANICS), FEASIBILITY STUDIES, HYDRO-SKIS (U)
IDENTIFIERS: AIR SEA CRAFT (U)

A 1/25-SCALE MODEL OF THE AIR-SEA CRAFT WAS BUILT AND TESTED TO DETERMINE ITS LANDING AND TAKE-OFF CHARACTERISTICS IN SMOOTH WATER AND IN IRREGULAR WAVES. THE HYDRODYNAMIC CONFIGURATION WAS OPTIMIZED BY A COMPUTER STUDY AND BY SMOOTH-WATER CONSTANT-SPEED TESTS, WHICH DEVELOPED THE SIZE, LOCATION, AND ANGLES OF ATTACK OF THE PLANING SURFACES FOR STABLE OPERATION. STATIC AND DYNAMIC LOADS AS WELL AS THE MOTIONS OF THE CRAFT WERE MEASURED, OVER A RANGE OF OPERATING CONDITIONS, IN TESTS CONDUCTED WITH A YAWED MODEL AND IN TESTS INVOLVING MODED TAKE-OFFS AND LANDINGS UP TO SEA STATE 5. THE RESULTS INDICATE THE AIR-SEA CRAFT TO BE A FEASIBLE AND PRACTICAL VEHICLE FOR CARRYING OUT THE ASW MISSION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-697 191 1/3
NATIONAL AERONAUTICAL ESTABLISHMENT OTTAWA (ONTARIO)

FLIGHT ASSESSMENT OF A VARIABLE-STABILITY HELICOPTER FOR STOL SIMULATIONS AND EVALUATION OF THE INFLUENCE OF SEVERAL LATERAL-DIRECTIONAL STABILITY DERIVATIVES. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,
JUN 69 30P MCGREGOR,D. M. ;
REPT. NO. NAE-LR-524
MONITOR: NRC 10953

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, SIMULATION), (*HELICOPTERS, *FLIGHT SIMULATORS), STABILITY, APPROACH, MANEUVERABILITY, UTILITY PLANES, HANDLING, ROLL, PERFORMANCE(ENGINEERING), CANADA (U)
IDENTIFIERS: U-1 AIRCRAFT, OTTER AIRCRAFT (U)

A PARTICULAR STOL AIRCRAFT (THE DE HAVILLAND OF CANADA, 'OTTER') WAS SIMULATED USING A VARIABLE-STABILITY HELICOPTER TO ASSESS THE SIMULATOR'S CAPABILITIES IN DUPLICATING THE FLIGHT CHARACTERISTICS OF THIS CLASS OF AIRCRAFT. DIRECT COMPARISONS WERE MADE BY THE PILOTS THROUGH ALTERNATE FLIGHTS IN THE SIMULATOR AND ON THE ACTUAL AIRCRAFT, AND THEY CONCLUDED THAT A VERY CONVINCING SIMULATION COULD BE EFFECTED, PARTICULARLY WITH RESPECT TO LATERAL-DIRECTIONAL CHARACTERISTICS. USING THE 'OTTER' AS THE BASE CONDITION, SEVERAL LATERAL-DIRECTIONAL STABILITY DERIVATIVES WERE VARIED TO INVESTIGATE THEIR INFLUENCES ON THE HANDLING QUALITIES DURING A LOW SPEED VISUAL MANOEUVRING AND APPROACH TASK. THE RESULTS OF THESE INVESTIGATIONS ARE PRESENTED IN THE FORM OF PILOT OPINION DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-700 900 1/3
DENVER UNIV COLO COLL OF ENGINEERING

AUTOMATIC STABILIZATION FOR V/STOL AIRCRAFT IN THE VERTICAL FLIGHT MODE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
DEC 69 76P BUECHLER,RALPH LEE I

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, FLIGHT CONTROL SYSTEMS), (*SHORT TAKE-OFF PLANES, FLIGHT CONTROL SYSTEMS), (*FLIGHT CONTROL SYSTEMS, STABILIZATION SYSTEMS), GUSTS, LIFT, OPTIMIZATION, POWER, GUST LOADS, THESES (U)
IDENTIFIERS: AUTOMATIC CONTROL (U)

POSTULATING A SIMPLE DESCRIPTIVE AIRCRAFT TRANSFER FUNCTION FOR NON-AERODYNAMIC, SLOW SPEED FLIGHT, A CONTROL METHOD IS PRESENTED FOR THE AUTOMATIC STABILIZATION OF LARGE, LIFT-FAN VERTICAL AND SHORT TAKE-OFF AND LANDING (V/STOL) AIRCRAFT FLYING IN THE VERTICAL FLIGHT MODE. DEAD-ZONE (BANG-BANG) CONTROL IS EMPLOYED, AND THE ENTIRE SCHEME IS TIME OPTIMAL IN THE SENSE THAT THE ORIGIN IS OBTAINED AS FAST AS POSSIBLE FOLLOWING EXIT FROM A DEAD-ZONE REGION AND IS FUEL CONSERVATIVE IN THE SENSE THAT SMALL DEVIATIONS WITHIN THIS DEAD-ZONE ARE TOLERATED, CAUSING NO FUEL TO BE BURNED. ALTHOUGH THE METHOD IS NOT LIMITED TO ANY PARTICULAR AIRCRAFT TRANSFER FUNCTION OR DISTURBANCE SHAPE, IT IS USED TO CALCULATE THE APPROXIMATE REACTION JET CONTROL POWER NEEDED TO CONTROL THE MOMENTUM TRANSFER TO THE AIRCRAFT CREATED BY A DISCRETE GUST UNDER A MAXIMUM ROLL DEFLECTION CRITERION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-701 728 1/3
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

THRUST AUGMENTATION CONSIDERATIONS FOR STOL AND EXTENDED CRUISE PROPULSION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
NOV 69 25P CAMPBELL,WILLIAM S. ;
REPT. NO. ARL-69-0182
PROJ: AF-7116

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *THRUST AUGMENTATION), AERODYNAMIC CHARACTERISTICS, PERFORMANCE(ENGINEERING), LEVEL FLIGHT, INJECTION (U)
IDENTIFIERS: EJECTOR POWERED WINGS (U)

THE APPLICATION OF THRUST AUGMENTATION CONCEPTS TO SHORT TAKE-OFF AND LANDING (STOL) AIRCRAFT PROPULSION IS DESCRIBED FOR SOME TYPICAL INSTALLATIONS. AERODYNAMIC AND EJECTOR THRUST EFFECTS ARE TREATED SEPARATELY SO THAT THE PERFORMANCE OF THE EJECTOR-POWERED WING CAN BE CALCULATED AS THAT OF A JET-FLAPPED AIRFOIL AND THE EJECTOR THRUST COMPONENTS THEN ADDED. SOME CONSIDERATIONS ON THE PERFORMANCE OF THE EJECTOR-POWERED WING IN CRUISE ARE INCLUDED. A PROGRAM FOR EJECTOR CALCULATIONS IS GIVEN. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-708 396 1/3 20/4
WEST VIRGINIA UNIV MORGANTOWN DEPT OF AEROSPACE ENGINEERING

NON-STEADY FLOW THROUGH A HEAVILY LOADED ACTUATOR DISK. (U)

AUG 69 126P HU,JIA J. ;HSU,YU K. ;
REPT. NO. TR-16
CONTRACT: N00014-68-A-0512
PROJ: NR-215-163

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON PROJECT THEMIS.

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, CARRIER LANDINGS), (*SHORT TAKE-OFF PLANES, CARRIER LANDINGS), (*AVIATION SAFETY, PROPELLERS(AERIAL)), (*PROPELLER BLADES, AERODYNAMIC LOADING), (*PROPELLER HUBS, AXIALLY SYMMETRIC FLOW), AIRFRAMES, VIBRATION, HELICOPTER ROTORS, AERODYNAMIC CHARACTERISTICS, PERTURBATION THEORY (U)
IDENTIFIERS: ACTUATOR DISK LOADING, NONSTEADY FLOW, THEMIS PROJECT (U)

THE PRESENT INVESTIGATION IS CONCERNED WITH THE NON-STEADY AXISYMMETRIC FLOW OF AN INVISCID, INCOMPRESSIBLE FLUID THROUGH A HEAVILY LOADED ACTUATOR DISK. SINCE THE STEADY STATE PROBLEM IS ESSENTIALLY NON-LINEAR, A CLOSED FORM SOLUTION IS NOT POSSIBLE. THE SMALL PERTURBATION THEORY IS APPLIED, AND THE FIRST-ORDER SOLUTION IS OBTAINED. THE RESULTING PERTURBATION EQUATIONS WHICH CONTAIN THE STEADY STATE SOLUTION AS COEFFICIENTS ARE SOLVED NUMERICALLY BY USING THE METHOD OF FINITE DIFFERENCES. THE NON-STEADY SOLUTIONS ARE COMPARED WITH THE ZEROTH-ORDER BASIC SOLUTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-712 667 20/1 1/3 5/5
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX

NOISE ASSOCIATED WITH OPERATION OF AIR FORCE OV-10A AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR-MAY 70,
AUG 70 20P GASAWAY,DONALD C. ;
REPT. NO. SAM-TR-70-51
PROJ: AF-7755
TASK: 775508

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRPLANE NOISE, SHORT TAKE-OFF PLANES), (*SHORT TAKE-OFF PLANES, HUMAN ENGINEERING), (*RECONNAISSANCE PLANES, AIRPLANE NOISE), AVIATION MEDICINE, UTILITY PLANES, OBSERVATION PLANES, AUDITORY PERCEPTION, COCKPITS (U)
IDENTIFIERS: COIN AIRCRAFT, OV-10A AIRCRAFT, V-10 AIRCRAFT (U)

NOISE MEASUREMENTS ARE DESCRIBED FOR NEAR-FIELD POSITIONS DURING ENGINE-STARTING AND PRE-TAKEOFF PHASES OF THE OV-10A AIRCRAFT. THE INTERNAL NOISE ENVIRONMENT DURING VARIOUS PHASES OF GROUND AND AIRBORNE OPERATIONS IS DESCRIBED AND ILLUSTRATED. FEATURES OF AEROMEDICAL IMPORTANCE ARE EMPHASIZED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-713 138 1/3
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

A FLIGHT SIMULATOR STUDY OF STOL TRANSPORT LATERAL CONTROL CHARACTERISTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 70 125P DRAKE,DOUGLAS E. ;BERG,
ROBERT A. ;TEPER,GARY L. ;SHIRLEY,W. ALLEN;
CONTRACT: DOT-FA69WA-2186
MONITOR: FAA-RD 70-61

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT CONTROL SYSTEMS), (*FLIGHT CONTROL SYSTEMS, *ROLL), FLIGHT SIMULATORS, TRANSPORT PLANES, STABILIZATION SYSTEMS, STANDARDS (U)
IDENTIFIERS: BREGUET 941 AIRCRAFT (U)

A SYSTEMATIC INVESTIGATION WAS CONDUCTED OF STOL TRANSPORT TERMINAL AREA LATERAL CONTROL CHARACTERISTICS TO IDENTIFY THE SIGNIFICANT CONSIDERATIONS AND ESTABLISH APPROPRIATE LATERAL CONTROL CRITERIA. THE INVESTIGATION CONSISTED OF AN ANALYSIS OF APPLICABLE EXISTING DATA AND A MOVING-BASE FLIGHT SIMULATOR TEST PROGRAM USING THE NASA AMES RESEARCH CENTER S-16 MOVING CAB TRANSPORT SIMULATOR. THE FLIGHT SIMULATOR PROGRAM COVERED A WIDE RANGE OF VEHICLE AERODYNAMIC AND PHYSICAL CHARACTERISTICS REPRESENTATIVE OF PRACTICAL STOL TRANSPORTS RANGING IN SIZE FROM 25,000 TO 130,000 POUNDS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-713 913 13/2
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J EAGLETON INST OF POLITICS

COMPARISON OF AIR POLLUTION FROM AIRCRAFT AND AUTOMOBILES (PROJECT EAGLE). (U)

DESCRIPTIVE NOTE: FINAL REPT.,
SEP 70 189P BRIGHT,COOPER ;LAMMINEN, TOIVO ;MULLALY,JAMES ;MARKOWITZ,FOREST ;SINGER, STANFORD M. ;
CONTRACT: W1-70-1919-1
MONITOR: FAA-NO 70-14

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR POLLUTION, *EXHAUST GASES), (*AIR TRANSPORTATION, AIR POLLUTION), (*TRANSPORTATION, AIR POLLUTION), (*SHORT TAKE-OFF PLANES, TRANSPORTATION), CONTROL, PASSENGER VEHICLES, CONNECTICUT, NEW JERSEY, NEW YORK, AIRPORTS, ATMOSPHERIC MOTION, CARBON MONOXIDE, DIFFUSION (U)
IDENTIFIERS: *HIGHWAY TRANSPORTATION, *AUTOMOBILE EXHAUST, *JET ENGINE EXHAUST, *AIR POLLUTION CONTROL, COMPARISON, EAGLE PROJECT, PREDICTIONS, ABATEMENT, MASS TRANSPORTATION (U)

THIS INVESTIGATION INTO THE ENVIRONMENTAL ASPECTS OF ESTABLISHING AN URBAN AIR TRANSPORTATION SYSTEM FOR THE TRI-STATE AREA OF CONNECTICUT, NEW JERSEY, AND NEW YORK FOR DAILY COMMUTING DEMONSTRATES THAT AIR POLLUTION AND ITS ASSOCIATED PHYSIOLOGICAL EFFECTS, WHICH ARE CREATED BY AUTOMOBILE ENGINE EMISSIONS, CAN BE DRASTICALLY REDUCED. SIMILAR RESULTS PERTAIN WHEN STOL AIR TRANSPORTATION IS SUBSTITUTED FOR AUTOMOBILES TO PROVIDE SERVICE FOR THE SAME AREA TO THE THREE MAJOR AIRPORTS AROUND NEW YORK CITY. FURTHER, THE STUDY SHOWS THAT AIR POLLUTION AT A STOLPORT IN MANHATTAN SUPPORTING SUCH A SYSTEM WOULD BE LESS THAN THE NORMAL BACKGROUND CONCENTRATION, EVEN DURING PEAK TRAVEL PERIODS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /Z0M08

AD-714 938 20/4 1/1 14/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

OBSERVATIONS OF TUNNEL FLOW SEPARATION INDUCED BY AN IMPINGING JET. (U)

APR 70 22P TYLER,R. A. ;WILLIAMSON,R. G. ;

REPT. NO. NRC-11617
MONITOR: NAE LR-537

UNCLASSIFIED REPORT

DESCRIPTORS: (•FLOW SEPARATION, •JETS), (•SHORT TAKE-OFF PLANES, FLOW SEPARATION), WIND TUNNEL MODELS, MODEL TESTS, NOZZLE GAS FLOW, CANADA (U)
IDENTIFIERS: JET IMPINGEMENT (U)

SINGLE JETS WERE DIRECTED TOWARDS, AND PERPENDICULAR TO, THE BOUNDARY OF THE 10-FT X 20-FT TEST SECTION OF THE NRC V/STOL PROPULSION TUNNEL. THE POSITION OF TUNNEL FLOW SEPARATION, ARISING FROM JET IMPINGEMENT AND FORWARD PENETRATION, WAS DETERMINED FROM WOOL TUFT OBSERVATIONS FOR VARIOUS CONDITIONS OF JET GEOMETRY, JET VELOCITY, AND TUNNEL SPEED, RELEVANT TO V/STOL MODELS INVOLVING DISCRETE JETS. THE RESULTS INDICATED THE SEPARATION POSITION, RELATIVE TO THE JET NOZZLE, TO BE A SIMPLE FUNCTION OF THE PRODUCT OF EFFECTIVE MAINSTREAM/JET VELOCITY RATIO AND NOZZLE HEIGHT/DIAMETER RATIO. A VALUE OF THIS PRODUCT GREATER THAN 1.5 WAS FOUND TO BE NECESSARY TO ENSURE TUNNEL FLOW SEPARATION DOWNSTREAM OF THE JET NOZZLE. AN APPROXIMATE EXTENSION TO INCLINED JETS, BASED ON LIMITED TEST DATA, IS INCLUDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-715 223 1/5
AMERICAN AIRLINES NEW YORK

TECHNICAL FEASIBILITY OF FLOATING INTERIM MANHATTAN STOLPORT. (U)

DESCRIPTIVE NOTE: FINAL REPT.
SEP 70 108P
CONTRACT: DOT-FA70WA-2411
PROJ: FAA-504-203-05H
MONITOR: FAA-RD 70-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH HOWARD, NEEDLES, TAMMEN AND BERGENOFF, SEATTLE, WASH. AND GIBBS AND COX, INC., NEW YORK.

DESCRIPTORS: (•AIRPORTS, FLOATING BODIES), (•SHORT TAKE-OFF PLANES, AIRPORTS), FEASIBILITY STUDIES, NEW YORK, RIVERS, SITE SELECTION, COSTS, FLIGHT DECKS, SHIP HULLS (U)
IDENTIFIERS: •FLOATING STOLPORTS, •STOLPORTS, COST ESTIMATES (U)

THE TECHNICAL FEASIBILITY OF A FLOATING INTERIM MANHATTAN STOLPORT, LOCATED IN THE HUDSON RIVER NEAR W. 30TH STREET, IS EXAMINED WITH REGARD TO THE SUITABILITY OF THE SITE FOR ATTAINING UNOBSTRUCTED AIRSPACE PROTECTION SURFACES, ASSURING FREEDOM FROM INTERFERENCE WITH RIVER NAVIGATION, AND HAVING MINIMAL IMPACT ON THE EXISTING SURFACE TRANSPORTATION NETWORK. THE REPORT PRESENTS AN ENGINEERING ANLYSIS AND COST ESTIMATE OF THE FLOATING STRUCTURE, INCLUDING FACILITIES REQUIRED IN SUPPORT OF STOLPORT OPERATIONS. THE SITE IS FOUND TO BE SUITABLE FOR A FLOATING INTERIM STOLPORT, AND THE MOST FEASIBLE FLOATING STRUCTURE WOULD CONSIST OF A FLIGHT DECK SUPPORTED ON INTERCONNECTED LIBERTY SHIP HULLS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-715 553 1/3
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

V/STOL HANDLING. I. CRITERIA AND
DISCUSSION. (U)

DEC 70 53P
REPT. NO. AGARD-577

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES,
HANDLING), STANDARDS, SHORT TAKE-OFF PLANES,
FLIGHT SIMULATORS, STABILITY, HELICOPTERS (U)

THE REPORT PRESENTS CRITERIA ON HANDLING QUALITIES FOR VTOL AND STOL AIRCRAFT. INCLUDED WITH EACH CRITERION IS A DISCUSSION POINTING OUT THE PILOT'S REASONS FOR INCLUDING A PARTICULAR HANDLING QUALITY FEATURE. THE CRITERIA ARE BASED ON RESULTS OF TESTS USING PILOTED GROUND-BASED SIMULATORS, VARIABLE STABILITY AIRCRAFT, PARTICULAR MODELS OF VTOL AND STOL AIRCRAFT, AND VARIABLE STABILITY HELICOPTERS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-718 798 20/4 1/1
GEORGIA INST OF TECH ATLANTA SCHOOL OF AEROSPACE ENGINEERING

AN EXPERIMENTAL INVESTIGATION OF A TURBULENT JET IN A CROSS FLOW. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
DEC 70 182P MOSHER,DAVID K. ;
REPT. NO. GIT-AER-70-7
CONTRACT: DAHC04-68-C-0004
MONITOR: AROD T-2117-E

UNCLASSIFIED REPORT

DESCRIPTORS: (•JET MIXING FLOW, INTERFERENCE), (•SHORT TAKE-OFF PLANES, LIFT), THRUST, INTERACTIONS, FLOW VISUALIZATION, VERTICAL TAKE-OFF PLANES, FLAT PLATE MODELS, THESES (U)
IDENTIFIERS: •CROSS FLOW, THEMIS PROJECT (U)

THE INTERFERENCE PHENOMENON OCCURRING WHEN A SUBSONIC TURBULENT JET EXHAUSTS NORMALLY FROM A LARGE FLAT PLATE INTO A LOW SPEED CROSSFLOW WAS EXPERIMENTALLY INVESTIGATED IN THE GEORGIA TECH NINE FOOT WIND TUNNEL. STATIC PRESSURES WERE MEASURED ON THE SURFACE AROUND THE JET, IN THE REGION OFF THE SURFACE, INCLUDING THE JET PLUME, WAKE AND SURROUNDING AREAS, THE AVERAGE TOTAL AND STATIC PRESSURES AND THE AVERAGE VELOCITY MAGNITUDES AND DIRECTIONS WERE DETERMINED. THREE JET EXIT CONFIGURATIONS WERE STUDIED, ONE CIRCULAR AND TWO SLOT-SHAPED WITH WIDTH TO LENGTH RATIOS OF 0.3 AND 3.4. ALL HAVE THE SAME EXIT AREA. THE EFFECTIVE JET TO CROSS-FLOW VELOCITY RATIO WAS VARIED, FOR EACH OF THE EXIT CONFIGURATIONS, OVER THE RANGE 4.0 TO 12.0. ANALYSIS OF THE DATA INDICATES THAT THE PRESSURE DISTRIBUTIONS INDUCED ON THE SURFACE ARE A COMBINED RESULT OF THE JET'S BLOCKING AND ENTRAINING EFFECTS ON THE CROSS FLOW WITH ENTRAINMENT BECOMING THE MORE DOMINANT OF THE TWO AS THE EFFECTIVE VELOCITY RATIO IS INCREASED. THIS RELATIVE DOMINANCE BRINGS ABOUT AN ATTENUATION OF TOTAL INTERFERENCE LIFT LOSS (WHEN COMPUTED AS A FRACTION OF GROSS THRUST) PRIMARILY BY CAUSING A RISE IN THE LOW PRESSURES IN THE WAKE REGION AS THE EFFECTIVE VELOCITY RATIO INCREASES. WHEN THE EFFECTIVE VELOCITY RATIO IS HELD FIXED, THE TOTAL INTERFERENCE LIFT LOSS INCREASES WITH INCREASING WIDTH TO LENGTH RATIO OF THE JET EXIT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-719 742 1/3 20/4
FRANK J SEILER RESEARCH LAB UNITED STATES AIR FORCE ACADEMY COLO

NONLINEAR VORTEX INTERACTIONS ON WING-CANARD CONFIGURATIONS. (U)

FEB 71 17P FINKLEMAN,DAVID I
REPT. NO. SRL-TR-71-0003
PROJ: AF-7905
TASK: 790500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AEROSPACE SCIENCE MEETING (9TH), 25-27 JAN 71. AIAA PAPER 71-95.

DESCRIPTORS: (•CANARD CONFIGURATION, LIFT), (•SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), THIN WINGS, VORTICES, MANEUVERABILITY, MATHEMATICAL MODELS, STABILITY, PRESSURE, WAKE (U)
IDENTIFIERS: •SLENDER WINGS, •WING CANARD CONFIGURATIONS, PRESSURE DISTRIBUTION, •VIGGEN AIRCRAFT (U)

CLOSE-COUPLED WING-CANARD CONFIGURATIONS ARE IDEALLY SUITED TO APPLICATIONS IN WHICH HIGH AIRCRAFT MANEUVERABILITY IS REQUIRED AT MODERATE SPEEDS. THE SAAB VIGGEN HAS EXPLOITED THE ADVANTAGES OF PLACING CANARD AND WING CLOSE TOGETHER, BUT NO THEORY HAS BEEN CAPABLE OF PREDICTING THE AERODYNAMICS OF THIS AIRCRAFT. IN THIS INVESTIGATION SACKS' METHOD OF SIMULATING VORTEX SHEETS WITH DISTRIBUTIONS OF DISCRETE VORTICES HAS BEEN APPLIED TO THE STUDY OF THE INTERACTION OF A SLENDER WING WITH A NEARLY CANARD SURFACE. THE CANARD IS DETRIMENTAL TO BOTH LIFT AND STATIC LONGITUDINAL STABILITY. THE EXTENT OF CANARD WAKE ROLL-UP IS IMPORTANT IN THE INTERACTION, AND THE FLATTER THE WAKE THE MORE ADVERSE IS THE INTERACTION. DOWNWARD CANARD DEFLECTION MAY LEAD TO INCREASES IN LIFT OF THE ENTIRE CONFIGURATION, AND IT IS OBSERVED THAT FOR SMALL VERTICAL SEPARATIONS BETWEEN THE SURFACES THE FORWARD PORTION OF THE WING IS INEFFECTIVE IN PRODUCING LIFT. IT IS DEMONSTRATED THAT THE CANARD CAN DIRECTLY AFFECT THE PRESSURE DISTRIBUTION ON THE WING AND APPLICATION OF THIS CONFIGURATION TO DIRECT LIFT CONTROL AND CONTROL CONFIGURED AIRCRAFT ARE NOTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-720 259 1/3 1/1 20/4
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

ASSESSMENT OF LIFT AUGMENTATION DEVICES. (U)

DESCRIPTIVE NOTE: LECTURE SERIES.
FEB 71 287P
REPT. NO. AGARD-LS-43-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT A LECTURE SERIES HELD AT INSTITUTE, RHODE-SAINT-GENESE (BELGIUM), ON 20-24 APR 70. NATO FURNISHED.

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, LIFT), (•LIFT, •AERODYNAMIC CONFIGURATIONS), AERODYNAMIC CHARACTERISTICS, VARIABLE-SWEEP WINGS, FLOW SEPARATION, TWO-DIMENSIONAL FLOW, MODEL TESTS, TRANSPORT PLANES, COST EFFECTIVENESS, LEADING EDGE, JET FLAPS, SYMPOSIA (U)
IDENTIFIERS: •LIFT AUGMENTATION DEVICES (U)

CONTENTS: AERODYNAMICS OF MECHANICAL HIGH-LIFT DEVICES; AERODYNAMICS OF PNEUMATIC HIGH-LIFT DEVICES; AERODYNAMICS OF VARIABLE SWEEP; FUNDAMENTAL ASPECTS OF FLOW SEPARATION UNDER HIGH-LIFT CONDITIONS; SOME NOTES ON TWO-DIMENSIONAL HIGH-LIFT TESTS IN WIND-TUNNELS; MODEL TESTING REQUIREMENTS AND TECHNIQUES FOR HIGH-LIFT SCHEMES--THREE-DIMENSIONAL ASPECTS; ANALYSIS OF TRANSPORT APPLICATIONS FOR HIGH-LIFT SCHEMES; ANALYSIS OF COMBAT AIRCRAFT APPLICATIONS FOR LIFT-AUGMENTATION DEVICES; FLIGHT TESTING MILITARY TRANSPORT AIRCRAFT FOR CLEARANCE IN THE STOL ROLE; LIFT-AUGMENTATION DEVICES AND THEIR EFFECT ON THE ENGINE; OPTIMISING THE PROPULSIVE/LIFT SYSTEM FOR TURBOFAN STOL AIRCRAFT CONSIDERING COST EFFECTIVENESS; A NEW TECHNIQUE FOR AEROFOIL LEADING-EDGE STUDIES; SOME COMMENTS ON CHARACTERISTICS OF HIGH-LIFT WINGS; THE HUNTING H.126 JET-FLAP RESEARCH AIRCRAFT; AERODYNAMIC RESEARCH ON HIGH-LIFT SYSTEMS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-721 166 1/3 1/2
CIVIL AERONAUTICS BOARD WASHINGTON D C

CIVIL AERONAUTICS BOARD PLANNING STUDY:
STOL-VTOL AIR TRANSPORTATION SYSTEMS, (U)

MAR 70 37P HINTZE,CARL , JR;

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, AIR TRANSPORTATION), (•VERTICAL TAKE-OFF PLANES, AIR TRANSPORTATION), (•AIR TRANSPORTATION, •CIVIL AVIATION), (•URBAN PLANNING, AIR TRANSPORTATION), DESIGN, ECONOMICS, SOCIOLOGY (U)

THE STUDY WAS PREPARED TO PROVIDE INFORMATION TO THE CIVIL AERONAUTICS BOARD MEMBERS AND STAFF ON THE CURRENT STATUS OF STOL AND VTOL AIRCRAFT, TERMINALS, AND ALLIED FACILITIES. THE STUDY IS A CONSOLIDATION OF AVAILABLE INFORMATION ARRANGED TO INDICATE THE CONSENSUS OF OPINION OF THE VARIOUS AUTHORITIES IN THE FIELD. THE MAJOR DESIGN CONCEPTS OF STOL AND VTOL AIRCRAFT AND SUPPORT SYSTEMS ARE DESCRIBED IN RELATIVELY NON-TECHNICAL TERMS. INCLUDED IS A BRIEF DESCRIPTION OF THE CHANGING SOCIO-ECONOMIC ASPECTS OF THE MAJOR METROPOLITAN AREAS OF THE NATION AND THEIR ANTICIPATED EFFECTS ON URBAN TRANSPORTATION REQUIREMENTS. THE STUDY SUMMARIZES THE PROBABLE COURSE OF EVENTS IN THE EVOLUTION OF STOL AND VTOL AIR TRANSPORTATION SYSTEMS, AND FUTURE PROJECTIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AL-723 294 14/2 20/4 1/1
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

AN INVESTIGATION OF SEVERAL SLOTTED WIND TUNNEL WALL CONFIGURATIONS WITH A HIGH DISC LOADING V/STOL MODEL. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 66-30 JUN 70, MAY 71 65P BINION,T. W. ; JR!
REPT. NO. AEDC-TR-71-77
CONTRACT: F40600-71-C-0002
PROJ: ARO-PD3714, ARO-PD3014

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO, INC., TULLAHOMA, TENN, REPT. NO. ARO-PWT-TR-71-43. MASTERS THESIS.

DESCRIPTORS: (*WALLS, CONFIGURATION), (*MODEL TESTS, INTERFERENCE), (*WIND TUNNELS, SHORT TAKE-OFF PLANES), DESIGN, WIND TUNNEL MODELS, AERODYNAMIC SLOTS, SUBSONIC CHARACTERISTICS, WAKE, AIRPLANE MODELS (U)
IDENTIFIERS: *SLOTTED WALL CONFIGURATIONS, DISC LOADING (U)

THE INVESTIGATION REPORTED HEREIN IS THE EXPERIMENTAL PORTION OF A UNIFIED THEORETICAL AND EXPERIMENTAL SEARCH FOR A SLOTTED WIND TUNNEL WALL CONFIGURATION WITH MINIMAL INTERFERENCE FOR CONVENTIONAL AND V/STOL MODELS. IT IS SHOWN THAT THEORY AND EXPERIMENT ARE IN EXCELLENT AGREEMENT FOR THE CLASSICAL CASE PROVIDED AN APPROPRIATE EXPRESSION IS USED TO RELATE THE WALL GEOMETRY TO THE BOUNDARY CONDITION. CLASSICAL DATA CORRECTION EQUATIONS ARE NOT APPROPRIATE FOR THE V/STOL CASE, HOWEVER, AN ADDITIONAL TERM, NOT PREDICTED BY THEORY, IS NEEDED TO ACCOUNT FOR CHANGES IN THE JET WAKE. GEOMETRIC PARAMETERS WHICH INFLUENCE THE WALL INTERFERENCE QUANTITIES ARE INDICATED. WALL CONFIGURATIONS ARE SHOWN WHICH WILL PRODUCE INTERFERENCE-FREE FORCE DATA TO A JET-TO-FREE-STREAM VELOCITY RATIO OF 4.8. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 124 1/3
MISSISSIPPI STATE UNIV STATE COLLEGE DEPT OF AEROPHYSICS AND AEROSPACE ENGINEERING

XV-11A FLIGHT TEST PROGRAM. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 71 118P MERTAUGH,L. J. ROBERTS,S. C. KIRAN,N. S. ;
REPT. NO. AASE-69-7
CONTRACT: DA-44-177-AMC-266(T)
PROJ: DA-1-F-162203-A-142
TASK: 1-F-162203-A-142-03
MONITOR: USAAVLABS TR-70-37

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, FLIGHT TESTING), (*RESEARCH PLANES, FLIGHT TESTING), BOUNDARY LAYER CONTROL, THRUST AUGMENTATION, SHROUDED PROPELLERS, CAMBER, WINGS (U)
IDENTIFIERS: XV-11A AIRCRAFT, V-11 AIRCRAFT (U)

THE REPORT PRESENTS THE RESULTS OF A TEST PROGRAM THAT WAS CONDUCTED TO EVALUATE THE PERFORMANCE AND STABILITY AND CONTROL CHARACTERISTICS OF THE XV-11A AIRCRAFT. THE AIRCRAFT IS A RESEARCH VEHICLE DESIGNED TO PERFORM BASIC AERODYNAMIC FLIGHT RESEARCH IN THE AREAS OF HIGH-LIFT BOUNDARY LAYER CONTROL, PROPELLER THRUST AUGMENTATION, LOW DRAG GEOMETRY, AND STOL AIRCRAFT HANDLING QUALITIES. THE AIRCRAFT INCORPORATES A NUMBER OF UNIQUE DESIGN FEATURES INCLUDING GLASS FIBER REINFORCED PLASTIC CONSTRUCTION; A DISTRIBUTED-SUCTION, HIGH-LIFT BOUNDARY LAYER CONTROL SYSTEM; A VARIABLE-CAMBER WING; AND A SHROUDED PROPELLER. THE TEST DATA SHOW THAT THE AIRCRAFT HAS SUFFICIENT PERFORMANCE AND STABILITY AND CONTROL FOR CONDUCTING LOW-SPEED AERODYNAMIC RESEARCH. HANDLING QUALITIES RESEARCH WOULD BE LIMITED BY THE HIGH LONGITUDINAL AND DIRECTIONAL CONTROL FORCE GRADIENTS. ALTHOUGH LOW STALL SPEEDS ARE DEMONSTRATED, THE INCREMENT IN LIFT DUE TO THE BOUNDARY LAYER CONTROL SYSTEM IS LESS THAN ANTICIPATED. AIRCRAFT PERFORMANCE IS SOMEWHAT LIMITED BY PROPELLER DEFICIENCIES DUE TO HIGH BLADE LOADING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-724 145 1/3 20/1
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

PERFORMANCE AND ACOUSTIC TESTING OF A VARIABLE CAMBER PROPELLER. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. MAR-JUL 70,
FEB 71 99P MCERLEAN,DONALD P. ;
EDWARDS,DONALD E. ;
REPT. NO. AFAPL-TR-70-80
PROJ: AF-3066
TASK: 306612

UNCLASSIFIED REPORT

DESCRIPTORS: (*PROPELLER BLADES, DESIGN), (*SHORT TAKE-OFF PLANES, *PROPELLER NOISE), CAMBER, MODEL TESTS, FLAPS, TRAILING EDGE, AERODYNAMIC CONFIGURATIONS, TEST FACILITIES, ACOUSTIC PROPERTIES, AERODYNAMIC CHARACTERISTICS (U)
IDENTIFIERS: *VARIABLE CAMBER PROPELLERS, NOISE POLLUTION, COMPUTER ANALYSIS (U)

THE REPORT PRESENTS THE TEST RESULTS OBTAINED FROM A SERIES OF PERFORMANCE AND ACOUSTIC NEAR-FIELD MEASUREMENTS ON A PROPELLER FITTED WITH A VARIABLE CAMBER FEATURE. THE SUBJECT PROPELLER EFFECTS A CHANGE IN CAMBER BY DEFLECTING A FLAP POSITIONED ALONG THE 72% CHORDAL LINE OF EACH BLADE. THE TESTS WERE CONDUCTED ON A 10,000 HORSEPOWER ELECTRIC WHIRL RIG. THE TESTS REPRESENT THE ONLY TEST DATA AVAILABLE ON THIS UNIQUE PROPELLER CONFIGURATION WHICH IS CONSIDERED TO HAVE GOOD POTENTIAL FOR V/STOL APPLICATIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-724 185 1/3 1/1
BOEING CO PHILADELPHIA PA VERTOL DIV

STOL HIGH-LIFT DESIGN STUDY. VOLUME I. STATE-OF-THE-ART REVIEW OF STOL AERODYNAMIC TECHNOLOGY. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-DEC 70, APR 71 205P MAY,FRED ;WIDDISON,COLIN A. ;
REPT. NO. D210-10201-1
CONTRACT: F33615-70-C-1277
MONITOR: AFFDL TR-71-26-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-724 186.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *AERODYNAMICS), STATE-OF-THE-ART REVIEWS, LIFT, DESIGN, FLAPS, PITCH(MOTION), PROPULSION, MATHEMATICAL PREDICTION (U)
IDENTIFIERS: SLIPSTREAM (U)

THE STATE OF THE ART OF STOL AERODYNAMIC TECHNOLOGY FOR SELECTED LIFT/PROPULSION CONCEPTS WAS SURVEYED TO IDENTIFY THE AVAILABLE TEST DATA AND PREDICTION METHODS IN THE LITERATURE. THE REPORT CONSISTS OF TWO VOLUMES. IN VOLUME I IMPORTANT AREAS OF TECHNOLOGY AND INFORMATION NECESSARY FOR THE EVALUATION OF STOL AIRCRAFT AERODYNAMICS ARE LISTED; THE AERODYNAMIC TEST DATA AND PREDICTION METHODOLOGY RELEVANT TO THE DEFLECTED SLIPSTREAM AND EXTERNALLY BLOWN FLAP CONCEPTS ARE ASSESSED, WITH EMPHASIS ON THE LATTER; AN EMPIRICAL METHOD FOR THE PREDICTION OF THE LONGITUDINAL AERODYNAMIC CHARACTERISTICS OF EXTERNALLY BLOWN FLAP CONFIGURATIONS IS PRESENTED; AND HIGH-LIFT TECHNOLOGY FOR FIVE LIFT/PROPULSION CONCEPTS IS ASSESSED IN APPLICATION TO A MEDIUM-SIZED STOL TRANSPORT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-724 186 1/3 1/1
BOEING CO PHILADELPHIA PA VERTOL DIV

STOL HIGH-LIFT DESIGN STUDY. VOLUME II. BIBLIOGRAPHY. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-DEC 70, APR 71 338P MAY,FRED ;WIDDISON,COLIN A. ;
REPT. NO. D210-10201-2
CONTRACT: F33615-70-C-1277
MONITOR: AFFDL TR-71-26-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-724 185.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *AERODYNAMICS), (*BIBLIOGRAPHIES, SHORT TAKE-OFF PLANES), LIFT, FLAPS, PROPULSION, FANS, TILT WINGS, ABSTRACTS (U)

THE VOLUME CONSISTS OF A BIBLIOGRAPHY THAT RESULTED FROM A LITERATURE SEARCH FOR AERODYNAMIC INFORMATION RELATED TO SEVEN LIFT/PROPULSION CONCEPTS SUITABLE FOR STOL AIRCRAFT. THE BIBLIOGRAPHY CONTAINS REFERENCES TO APPROXIMATELY 900 REPORTS CLASSIFIED BY CONCEPT AND BY TECHNOLOGICAL AREA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-725 705 17/7
EPSCO INC WESTWOOD MASS

STOL AIRCRAFT INSTRUMENT LANDING SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 71 66P HILLS,ROBERT S. ;
CONTRACT: DOT-FA-69-WA-2098
PROJ: FAA-320-114-02N
MONITOR: FAA-RD 71-17

UNCLASSIFIED REPORT

DESCRIPTORS: (•INSTRUMENT LANDINGS, •MICROWAVE EQUIPMENT), (•SHORT TAKE-OFF PLANES, INSTRUMENT LANDINGS), RADIO SCANNING, AIRPORTS, AZIMUTH, GLIDE PATH SYSTEMS, DISTANCE-MEASURING EQUIPMENT (U)
IDENTIFIERS: MODILS(MODULAR MICROWAVE INSTRUMENT LANDING SYSTEMS), •MODULAR MICROWAVE INSTRUMENT LANDING SYSTEMS (U)

THE REPORT DESCRIBES THE DEVELOPMENT OF A MICROWAVE SCANNING BEAM INSTRUMENT LANDING SYSTEM FOR STOL AIRCRAFT AND AIRPORTS (MODILS). IT IS A FLEXIBLE SYSTEM MEETING OR EXCEEDING CATEGORY I REQUIREMENTS WITH A GROWTH POTENTIAL FOR HANDLING ALL TYPES OF AIRCRAFT IN CATEGORIES II AND III BY MODULAR ADDITIONS. IN AZIMUTH IT PROVIDES PLUS OR MINUS 0.5 DEGREE ACCURACY WITH PILOT SELECTED COURSE WIDTH BETWEEN PLUS OR MINUS 2 DEGREES AND PLUS OR MINUS 10 DEGREES WITHIN A 60 DEGREE COURSE SECTOR. A LEFT OR RIGHT SKEW COURSE, AS WELL AS A CENTERLINE COURSE IS SELECTABLE. IN ELEVATION IT PROVIDES PLUS OR MINUS 0.1 DEGREE ACCURACY OF A PILOT SELECTED GLIDE SLOPE BETWEEN 3 DEGREES AND 12 DEGREES AND PATH WIDTH OF PLUS OR MINUS 1 TO PLUS OR MINUS 5 DEGREES. INTEGRAL DME FUNCTIONS ARE PROVIDED WITH AN ACCURACY OF PLUS OR MINUS 0.01 NAUTICAL MILES PLUS OR MINUS 1% OF RANGE TO A RANGE OF APPROXIMATELY 10 NAUTICAL MILES. THE GROUND STATION IS ENTIRELY DUALISTIC EXCEPT FOR ANTENNAS. SWITCH-OVER FROM MAIN TO STANDBY EQUIPMENT IS CONTROLLED BY INTEGRAL DUAL MONITOR UNITS OPERATING IN PARALLEL. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-725 746 1/3
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

THE GENERATION OF A MILITARY SPECIFICATION FOR FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT-MIL-F-83300. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 66-MAR 71, APR 71 41P KEY,DAVID L. ;
REPT. NO. CAL-BB-2925-F-1
CONTRACT: AF 33(615)-3736, F33615-70-C-1322
PROJ: AF-698DC
MONITOR: AFFDL TR-71-23

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, SPECIFICATIONS), (*SHORT TAKE-OFF PLANES, SPECIFICATIONS), PERFORMANCE(ENGINEERING), FLIGHT CONTROL SYSTEMS, STABILITY (U)

THE DOCUMENT DESCRIBES A FOUR YEAR EFFORT WHICH LED TO THE ADOPTION OF A NEW MILITARY SPECIFICATION MIL-F-83300, 'FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT', AND THE PUBLICATION OF A SUPPORTING DOCUMENT, 'BACKGROUND INFORMATION AND USER GUIDE FOR MIL-F-83300, MILITARY SPECIFICATION - FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT' (AFFDL-TR-70-88); INCLUDED IN THE REPORT IS AN ASSESSMENT OF THE STATUS OF V/STOL FLYING QUALITIES RESEARCH AND RECOMMENDATIONS FOR FUTURE WORK. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-726 596 21/8 20/4 1/3
FLIGHT DYNAMICS RESEARCH CORP BURBANK CALIF

A JET FLAP DIFFUSER EJECTOR. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 70-MAY 71,
JUN 71 158P ALPERIN,MORTON (MARLOTTE,
GARY L. ;
REPT. NO. TR-71-06-01
CONTRACT: F33615-70-C-1656
PROJ: AF-1366
MONITOR: AFFDL TR-71-66

UNCLASSIFIED REPORT

DESCRIPTORS: (•JET PUMPS, COANDA EFFECT),
(•SHORT TAKE-OFF PLANES, THRUST AUGMENTATION),
VERTICAL TAKE-OFF PLANES, JET FLAPS, DIFFUSERS,
KINETIC ENERGY, PRESSURE, TEST METHODS,
MATHEMATICAL MODELS (U)
IDENTIFIERS: EJECTORS (U)

THE USE OF A JET FLAP DIFFUSER FOR RECOVERY OF EJECTOR JET KINETIC ENERGY HAS BEEN INVESTIGATED IN A TWO-DIMENSIONAL EXPERIMENT. UTILIZING AN EJECTOR WHICH EMPLOYS A COANDA INLET FOR NINETY DEGREE ROTATION OF THE PRIMARY FLOW. PERFORMANCE IS COMPARED TO A SOLID DIFFUSER EJECTOR OF THE EQUIVALENT POWER AND CHANNEL WIDTH. THE JET FLAP DIFFUSER EJECTOR APPEARS TO HAVE AN ADVANTAGE OVER SOLID DIFFUSER EJECTORS FOR THE RAPID APPLICATION OF ADDITIONAL THRUST FOR CONTROL PURPOSES, AS WELL AS FOR THE UTILIZATION OF ENGINE POWER IN THE PRODUCTION OF PROPULSIVE ENERGY. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-726 962 20/1
WYLE LABS ROCKVILLE MD

EFFECTIVE PERCEIVED NOISE LEVEL EVALUATED FOR STOL AND OTHER AIRCRAFT SOUNDS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAY 70 118P ADCOCK,B. D. !OLLERHEAD,J.
B. ;
REPT. NO. WR-70-9
CONTRACT: FA-67-WA-1731
MONITOR: FAA-NO 70-5

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRPLANE NOISE, •AUDITORY PERCEPTION), (•SHORT TAKE-OFF PLANES, AIRPLANE NOISE), AIRCRAFT ENGINES (U)

A PAIRED COMPARISON EXPERIMENT WAS CONDUCTED IN WHICH A GROUP OF THIRTY TWO SUBJECTS EVALUATED, IN A PROGRESSIVE WAVE FIELD, THE NOISINESS OF SIXTY RECORDED AIRCRAFT FLYOVER SOUNDS. THIRTY OF THESE RECORDINGS WERE FROM SHORT TAKE-OFF AND LANDING (STOL) AIRCRAFT. THE COMPLETE SET INCLUDED A WIDE RANGE OF TURBOFAN, TURBOJET, PISTON ENGINE AND TURBOPROP POWERED AIRCRAFT IN A VARIETY OF CATEGORIES. THE RESULTS WERE ANALYZED TO TEST THE ABILITY OF THE EFFECTIVE PERCEIVED NOISE LEVAL (EPNL) AND OTHER SCALES TO PREDICT THE SUBJECTIVE RESPONSES. BECAUSE THE SAMPLE OF AIRCRAFT SOUNDS WAS UNUSUALLY LARGE IN NUMBER, VARIETY, DYANMIC RANGE AND DURATION, THE TEST WAS CONSIDERED TO BE SEVERE. THE MAIN CONCLUSION OF THE STUDY IS THAT THE EPNL PROCEDURE PERFORMS AS WELL FOR THE STOL SOUNDS AS IT DOES FOR THE CTOL (CONVENTIONAL TAKE-OFF AND LANDING AIRCRAFT) SOUNDS AND MAY THUS BE USED WITH EQUAL CONFIDENCE FOR RATING THE SOUNDS OF AIRCRAFT IN BOTH CLASSES. WHEN THE SOUNDS WERE DIVIDED INTO PROPULSION SYSTEM CATEGORIES IT WAS FOUND THAT EPNL, IN COMMON WITH OTHER SCALES, PERFORMED MOST CONSISTENTLY FOR JETS, PISTON ENGINED AIRCRAFT AND TURBOPROPS, IN THAT ORDER. IN GENERAL, THE INTEGRATED DURATION CORRECTION PROVED SUPERIOR TO AN APPROXIMATE CORRECTION BASED ON THE 10 DB-DOWN DURATION. ANALYSIS OF THE RESULTS SHOWED THAT THE AVERAGE MAGNITUDE OF THE TONE-CORRECTION WAS MORE THAN 3 DB AND THAT CORRECTIONS WERE AUTOMATICALLY APPLIED IN PRACTICALLY ALL CASES. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-728 948 1/3
DEUTSCHE FORSCHUNGSANSTALT FUER LUFT- UND RAUMFAHRT E V
BRUNSWICK (WEST GERMANY) INSTITUT FUER STRAHLANTRIEBE

STRAHLDEFLEXION ZUR S/VTOL-
SCHUBVEKTORSTEUERUNG (JET DEFLECTION FOR S/
VTOL THRUST VECTOR CONTROL). (U)

62 19P GRASMANN,KURT
REPT. NO. DFL-224

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN JAHRBUCH WGLR P381-398
1962. NO COPIES FURNISHED BY DDC OR NTIS.
SUPPLEMENTARY NOTE: TEXT IN GERMAN; SUMMARIES IN
ENGLISH AND FRENCH.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, LIFT),
(*VERTICAL TAKE-OFF PLANES, *THRUST VECTOR CONTROL
SYSTEMS), ATTITUDE CONTROL SYSTEMS, STABILIZATION,
CONTROL, EFFICIENCY, WEST GERMANY (U)
IDENTIFIERS: *THRUST DEFLECTORS (U)

THE AUTHOR REPORTS ON INVESTIGATIONS ON THE ECONOMY OF THRUST DEFLECTORS USED TO CONTROL THE THRUST VECTOR OF S/VTOL AIRCRAFT. FIRST, THE SYSTEM OF JET DEFLECTION IS ANALYZED. FUNDAMENTAL REQUIREMENTS ARE THEN FORMULATED AND FACTORS OF EFFICIENCY, SUCH AS THRUST COEFFICIENT AND PRESSURE LOSS COEFFICIENT, ARE DEFINED. THE SECOND PART DEALS WITH DETAILS OF THE SPECIAL TECHNIQUE OF JET DEFLECTION TESTS, AND COMMUNICATES RESULTS OBTAINED FROM THESE TESTS ON DIFFERENT DEFLECTION SYSTEMS. SOME ESSENTIAL DIRECTIVES TO APPRECIATE AND AMELIORATE THRUST DEFLECTORS HAVE ALREADY BEEN OBTAINED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-729 184 1/3 20/1
TACTICAL AIR COMMAND LANGLEY AFB VA OFFICE OF OPERATIONS ANALYSIS

STOL TRANSPORT PARAMETERS (MILITARY AND COMMERCIAL) WITH SPECIAL EMPHASIS ON NOISE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAY 71 144P STICKLE,GEORGE W. ;BATTEN, BOBBY G. ;
REPT. NO. TAC-OA-TR-70-17

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •AIRPLANE NOISE); (•TRANSPORT PLANES, AIRPLANE NOISE), LAW, REDUCTION, ATTENUATION, TURBOFAN ENGINES, JET ENGINE NOISE, PROPELLER NOISE, GAS TURBINES, COMMERCIAL PLANES, AIR POLLUTION (U)
IDENTIFIERS: NOISE REDUCTION, NOISE POLLUTION (U)

A SHORT HANDBOOK APPROACH RELATING PHYSICAL AND ENVIRONMENTAL SELECTION PARAMETERS TO STOL TRANSPORT CAPABILITY IS PROVIDED. IT REVIEWS EXISTING LAWS AND REGULATIONS ON TRANSPORT NOISE ABATEMENT. IT REVIEWS THE NOISE FROM TURBOFAN POWERED TRANSPORTS AND DISCUSSES THE FUTURE RESEARCH AND DEVELOPMENT TRENDS AND NEEDS. IT PROVIDES AN INDEPTH ANALYSIS OF FREE TURBINE TURBOPROPELLER NOISE ABATEMENT PROVIDING ENGINEERING FORMULAS, EXAMPLES, AND EXPERIMENTAL DATA. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-730 121 1/3 20/4
CORNELL AERONAUTICAL LAB INC BUFFALO N Y

DEVELOPMENT OF ADVANCED TECHNIQUES FOR THE IDENTIFICATION OF V/STOL AIRCRAFT STABILITY AND CONTROL PARAMETERS. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 69-DEC 70, AUG 71 359P CHEN,ROBERT T. N. ; EULRICH,BERNARD J. ;LEBACQZ,J. VICTOR ;
REPT. NO. CAL-BM-2820-F-1
CONTRACT: N00019-69-C-0534

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (•SHORT TAKE-OFF PLANES, MATHEMATICAL MODELS), FLIGHT CONTROL SYSTEMS, EQUATIONS OF MOTION, FLIGHT PATHS, STABILITY, HOVERING, ALGORITHMS (U)
IDENTIFIERS: •TRANSITION FLIGHT, KALMAN FILTERS, X-22 AIRCRAFT (U)

CONTEMPORARY ANALYSES OF TRANSITION FLIGHT OF V/STOL AIRCRAFT ARE BASED ON AERODYNAMIC DATA MEASURED IN A WIND TUNNEL OR ON ANALYTICAL PREDICTION USING METHODS DEVELOPED FOR CONVENTIONAL AIRCRAFT. THE VALIDITY AND ACCURACY OF THESE TECHNIQUES FOR V/STOL AIRCRAFT HAS NOT YET BEEN ESTABLISHED, AND IT IS ESSENTIAL THAT THEY BE CORRELATED WITH FLIGHT TEST DATA THROUGH PARAMETER IDENTIFICATION. IN SPITE OF THE COMPLICATED NATURE OF V/STOL DYNAMICS IN TRANSITION, SOME METHOD OF IDENTIFYING THESE CHARACTERISTICS IS REQUIRED. THIS REPORT DOCUMENTS THE DEVELOPMENT OF IDENTIFICATION TECHNIQUES TO MEET THIS REQUIREMENT. THE REPORT FIRST PRESENTS THE SELECTION OF A MATHEMATICAL MODEL TO REPRESENT A V/STOL AIRCRAFT (THE X-22A). THIS IS FOLLOWED BY A DISCUSSION OF AVAILABLE IDENTIFICATION TECHNIQUES. BASED UPON A THOROUGH KNOWLEDGE OF THE REQUIREMENTS OF THIS PROGRAM AND THE LIMITATIONS OF THE AVAILABLE TECHNIQUES, ADVANCED TECHNIQUES SUITABLE FOR IDENTIFICATION OF V/STOL AIRCRAFT STABILITY AND CONTROL PARAMETERS ARE DEVELOPED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-730 571 1/3
HONEYWELL INC ST PAUL MINN RESEARCH DEPT

CONCEPTUAL STUDY TO APPLY ADVANCED FLIGHT CONTROL TECHNOLOGY TO THE COIN OR TRIM AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 70-3 FEB 71, JUN 71 151P SMITH,G. A. ;HAMMER,J. M. ;ROSE,R. E. ;
REPT. NO. 12225-FR(R)
CONTRACT: N00019-70-C-0349

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *FLIGHT CONTROL SYSTEMS), JETS, AIRPLANE MODELS, WINGS, WIND TUNNEL MODELS, LIFT, DRAG, AIRFOILS, EXPERIMENTAL DATA (U)
IDENTIFIERS: TRIM(TRAILS ROADS INTERDICTION MISSIONS), TRAILS ROADS INTERDICTION MISSION, TRIM AIRCRAFT, OV-10 AIRCRAFT, OV-10A AIRCRAFT, VARIABLE DEFLECTION THRUSTERS (U)

INVESTIGATIONS OF THE VARIABLE DEFLECTION THRUSTER (VDT) FOR A NON-EXTERNAL-MOVING SURFACES (NEMS) FLIGHT CONTROL SYSTEM HAVE BEEN EXTENDED TO DETERMINE THE EFFECTS OF FINITE ASPECT RATIO AND PART-SPAN BLOWING AT SUBSONIC SPEEDS. WIND TUNNEL TESTS HAVE REVEALED THAT FULL-SPAN BLOWING IS MORE EFFECTIVE THAN PART-SPAN BLOWING FOR OBTAINING LIFT OR ROLLING MOMENTS. IT WAS ALSO SHOWN THAT THE 'LIFT EFFECTIVENESS' DECREASES WHEN THE RATIO OF BLOWN AREA TO WING AREA DECREASES OR WHEN A PART-SPAN BLOWN AREA IS MOVED TOWARD THE WING TIP. THE RESULTS OF THE WIND TUNNEL STUDY INDICATE THAT AVAILABLE THEORETICAL ANALYSES PROVIDE SATISFACTORY PREDICTIONS OF JET-FLAP LIFT FOR FULL SPAN BLOWING, BUT FURTHER THEORETICAL WORK IS NEEDED, ESPECIALLY TO DETERMINE THE EFFECTS OF PART-SPAN BLOWING. A STUDY TO EXAMINE THE FEASIBILITY OF USING VDT BLOWING FOR PRIMARY FLIGHT CONTROL OF COIN (COUNTERINSURGENCY OR TRIM (TRAILS, ROADS AND INTERDICTION MISSIONS) AIRCRAFT WAS UNDERTAKEN. THE ESTIMATES OF THE REQUIRED THRUST, MASS FLOW AND HORSEPOWER SEEMED REASONABLE, SO DUCT LOSSES WERE CALCULATED, AND THE WEIGHT AND FUEL REQUIREMENTS WERE ESTIMATED. A VDT PRIMARY FLIGHT CONTROL SYSTEM WEIGHING 480 LB WAS HYPOTHESIZED, AND THE MANEUVERING CAPABILITY OF AN AIRCRAFT WITH THIS NEMS SYSTEM WAS COMPARED TO THE AIRCRAFT WITH CONVENTIONAL CONTROLS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-732 570 1/3
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

A FLIGHT SIMULATOR STUDY OF STOL TRANSPORT DIRECTIONAL CONTROL CHARACTERISTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 135P BERG,ROBERT A. ;SHIRLEY,W.
ALLEN ;TEPER,GARY L. ;CRAIG,SAMUEL J. ;
CONTRACT: DOT-FA70WA-2395
MONITOR: FAA-RD 71-81

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *FLIGHT CONTROL SYSTEMS), (*TRANSPORT PLANES, FLIGHT CONTROL SYSTEMS), FLIGHT SIMULATORS, ROLL, YAW, APPROACH, AIRCRAFT LANDINGS (U)

A SYSTEMATIC INVESTIGATION WAS CONDUCTED OF STOL TRANSPORT TERMINAL AREA DIRECTIONAL CONTROL CHARACTERISTICS TO IDENTIFY THE SIGNIFICANT CONSIDERATIONS AND TO ESTABLISH APPROPRIATE DIRECTIONAL CONTROL CRITERIA. THE INVESTIGATION CONSISTED OF AN ANALYSIS OF EXISTING DATA AND A MOVING-BASE FLIGHT SIMULATOR PROGRAM USING THE NASA AMES RESEARCH CENTER S-16 MOVING CAB TRANSPORT SIMULATOR. THE SIMULATOR TEST PROGRAM COVERED A BROAD RANGE OF LATERAL AND DIRECTIONAL AERODYNAMIC CHARACTERISTICS REPRESENTATIVE OF TYPICAL STOL TRANSPORT AIRCRAFT. THIS EFFORT IS THE SECOND PHASE OF AN EXTENSIVE STOL SIMULATION PROGRAM, THE FIRST PHASE OF WHICH WAS DEVOTED TO THE INVESTIGATION OF LATERAL CONTROL CHARACTERISTICS. THE PRESENT STUDY REVEALED THE EXISTENCE OF AN APPRECIABLE INTERACTION BETWEEN THE ROLL AND THE HEADING CONTROL TASKS WHICH SUGGESTS THAT ROLL-MODE DAMPING REQUIREMENTS SHOULD BE SPECIFIED IN TERMS OF THE HEADING DELAY CHARACTERISTICS. LATERAL CONTROL SENSITIVITY TESTS WERE CONDUCTED WHICH CORROBORATED THE RESULTS OF THE FIRST PHASE OF THE PROGRAM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-732 681 1/3
RAND CORP SANTA MONICA CALIF

A MODEL FOR EVALUATING VSTOL VERSUS CTOL COMBAT AIRCRAFT SYSTEMS, (U)

MAR 71 30P HOROWITZ,SEYMOUR ;SHISHKO, ROBERT ;
REPT. NO. P-4587

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH FEDERAL AVIATION ADMINISTRATION, WASHINGTON, D. C. AND YALE UNIV., NEW HAVEN, CONN.

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, OPTIMIZATION), COST EFFECTIVENESS, MATHEMATICAL MODELS, EFFECTIVENESS, PROBABILITY, SYSTEMS ENGINEERING (U)
IDENTIFIERS: COST MODELS (U)

THE PAPER DESCRIBES A COST-EFFECTIVENESS STUDY OF THE USE OF VERTICAL OR SHORT TAKEOFF AND LANDING (VSTOL) AIRCRAFT FOR COMBAT MISSIONS. A COMPARISON IS MADE WITH CONVENTIONAL (CTOL) AIRCRAFT AS TACTICAL FIGHTERS IN A FUTURE NATO ENVIRONMENT. A MODEL YIELDING THE PROBABILITY OF COMPLETING N SUCCESSIVE MISSIONS IS USED AS A MEASURE OF COMBAT EFFECTIVENESS. A COST MODEL WAS CONSTRUCTED TO REFLECT THE RESOURCE IMPACT OF THE SAME VARIABLES OR ALTERNATIVES THAT AFFECT THE MEASURE OF EFFECTIVENESS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-732 842 13/11 1/3
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

WHY EJECTORS FOR AIRCRAFT PROPULSION-LIFT SYSTEMS AND WHERE WE STAND. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 71 41P FANCHER,RICHARD B. ;
REPT. NO. ARL-71-0140
PROJ: AF-7116

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET PUMPS, PERFORMANCE(ENGINEERING)), (*SHORT TAKE-OFF PLANES, *THRUST AUGMENTATION), NOZZLE AREA RATIO, DIFFUSERS, LIFT, THRUST AUGMENTOR NOZZLES, JET MIXING FLOW, EXPERIMENTAL DATA (U)
IDENTIFIERS: EVALUATION (U)

THE THRUST AUGMENTATION, LIFT AUGMENTATION AND NOISE REDUCTION CHARACTERISTICS OF COMPACT EJECTORS MAKE THEM POTENTIALLY ATTRACTIVE FOR PROPULSION LIFT SYSTEMS; HOWEVER IN THE PAST, POOR THRUST AUGMENTATION RESULTS HAVE NEGATED THE OTHER BENEFITS. THIS REPORT COVERS THE GENERAL CHARACTERISTICS OF EJECTORS POINTING OUT WHAT MAKES THEM ATTRACTIVE AND WHY ONLY CERTAIN TYPES OF EJECTORS ARE OF INTEREST. IT REVIEWS THE KEY REQUIREMENTS FOR HIGH PERFORMANCE THRUST AUGMENTATION. IT ALSO PRESENTS A SUMMARY OF THE PERFORMANCE RESULTS ACHIEVED THUS FAR AND PROPOSES SOME POSSIBLE APPLICATIONS FOR VARIOUS TYPES OF V/STOL AIRCRAFT. (AUTHOR) (U)

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-733 185 1777
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

DETERMINATION OF STOL AIR TERMINAL TRAFFIC CAPACITY THROUGH USE OF COMPUTER SIMULATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
SEP 71 68P RINKER,ROBERT EVANS ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR TRAFFIC CONTROL SYSTEMS, PROGRAMMING(COMPUTERS)), (*SHORT TAKE-OFF PLANES, TERMINAL FLIGHT FACILITIES), AIR TRAFFIC CONTROL TERMINAL AREAS, AIRCRAFT LANDINGS, TAKE-OFF, TIME STUDIES, CONTROL SEQUENCES, MATHEMATICAL MODELS, COMPUTER PROGRAMS, THESES (U)
IDENTIFIERS: COMPUTERIZED SIMULATION (U)

THE CAPACITY OF AN AIR TERMINAL FOR SHORT TAKEOFF AND LANDING AIRCRAFT IS ANALYZED. THE TERMINAL IS CONSIDERED TO BE OPERATING AS PART OF AN INTRA-URBAN AIR RAPID TRANSIT SYSTEM. THE AIR TRAFFIC FLOW THROUGH THE TERMINAL IS MODELED BY A COMPUTER SIMULATION WRITTEN IN BOTH THE FORTRAN IV AND GPSS LANGUAGES. THE MODEL IS USED TO SOLVE THE TRAFFIC CAPACITY PROBLEM UNDER TWO SETS OF TRAFFIC CONTROL RULES. IN THE FIRST CASE, EXISTING FAA RULES, WHICH REQUIRE 3 MILES SEPARATION BETWEEN ARRIVALS AND 2 MILES BETWEEN AN ARRIVAL AND A DEPARTURE, ARE USED. IN A SECOND CASE, THE RULES ARE 2 MILES BETWEEN ARRIVALS AND 1 MILE BETWEEN AN ARRIVAL AND A DEPARTURE. A DETAILED DESCRIPTION OF THE MODEL IS PRESENTED SO THAT OTHERS MIGHT USE THE MODEL. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-733 756 1/3
TRANSPORTATION SYSTEMS CENTER CAMBRIDGE MASS

LINEARIZED MATHEMATICAL MODELS FOR DE HAVILLAND CANADA 'BUFFALO AND TWIN OTTER' STOL TRANSPORTS. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
JUN 71 112P MACDONALD,R. A. ;GARELICK, MEL ;O'GRADY,J. ;
REPT. NO. TSC-FAA-71-8

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, STABILITY), MATHEMATICAL MODELS, CONTROL SURFACES, LIFT, DRAG, EQUATIONS OF MOTION, PERTURBATION THEORY, AIR TRAFFIC CONTROL SYSTEMS (U)
IDENTIFIERS: DHC-5 AIRCRAFT, DHC-6 AIRCRAFT, SIX DEGREES OF FREEDOM (U)

LINEARIZED SIX DEGREE OF FREEDOM RIGID BODY AIRCRAFT EQUATIONS OF MOTION ARE PRESENTED IN A STABILITY AXES SYSTEM. VALUES OF STABILITY DERIVATIVES ARE ESTIMATED FOR TWO REPRESENTATIVE STOL AIRCRAFT - THE DEHAVILLAND OF CANADA 'BUFFALO' AND 'TWIN OTTER.' THESE ESTIMATES ARE BASED ON ANALYTICAL EXPRESSIONS INCLUDED IN THE REPORT. THE COMBINATION OF THE EQUATIONS OF MOTION AND THE ESTIMATED STABILITY DERIVATIVES PROVIDES AN AIRCRAFT MODEL WHICH IS USEFUL FOR NAVIGATION, GUIDANCE AND ATC STUDIES. RESULTING TRANSIENT RESPONSES TO CONTROL INPUTS ARE PRESENTED. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-735 399 17/7 1/3
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J

ANALYTICAL STUDY OF THE ADEQUACY OF VOR/DME AND DME/DME GUIDANCE SIGNALS FOR V/STOL AREA NAVIGATION IN THE LOS ANGELES AREA. (U)

DESCRIPTIVE NOTE: INTERIM REPT. JUL 70-JUN 71,
DEC 71 102P DINERMAN,BERNHART V. ;
REPT. NO. FAA-NA-71-48
PROJ: FAA-045-390-01X, FAA-330-014-04X
MONITOR: FAA-RD 71-96

UNCLASSIFIED REPORT

DESCRIPTORS: (*NAVIGATIONAL AIDS, RELIABILITY(ELECTRONICS)), (*SHORT TAKE-OFF PLANES, ALL-WEATHER AVIATION), CIVIL AVIATION, VERTICAL TAKE-OFF PLANES, TERMINAL FLIGHT FACILITIES, DISTANCE-MEASURING EQUIPMENT, FLIGHT PATHS, OPTIMIZATION, FEASIBILITY STUDIES, CALIFORNIA (U)
IDENTIFIERS: VOR(VERY HIGH FREQUENCY OMNIRANGE), VERY HIGH FREQUENCY OMNIRANGE, EVALUATION (U)

AN ANALYSIS WAS PERFORMED BY PERSONNEL OF THE NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER (NAFEC) TO DETERMINE THE ADEQUACY OF VERY HIGH FREQUENCY OMNIRANGE/DISTANCE MEASURING EQUIPMENT (VOR/DME) GUIDANCE SIGNALS FOR VERTICAL/SHORT TAKEOFF AND LANDING (V/STOL) AIRCRAFT AREA NAVIGATION (RNAV) IN THE LOS ANGELES (LAX) AREA. GUIDANCE SIGNALS WERE DERIVED FROM EXISTING VOR/DME AND 'CONVERTED' VOR FACILITIES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-737 752 1/3
ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LAB FORT EUSTIS VA EUSTIS DIRECTORATE

DYNAMIC RESPONSE OF THE OV-1A AIRCRAFT TO SOFT FIELD LANDINGS. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUL-AUG 67,
OCT 71 147P ALEXANDER,WILLIAM T. ;
PROJ: DA-1-F-162204-A-146
TASK: 1-F-162204-A-14602
MONITOR: USAAMRDL TR-71-62

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRCRAFT LANDINGS, TERRAIN), (•SHORT TAKE-OFF PLANES, AIRCRAFT LANDINGS), ROUGHNESS, LANDING IMPACT, PROGRAMMING(COMPUTERS), EQUATIONS OF MOTION, OBSERVATION PLANES (U)
IDENTIFIERS: OV-1A AIRCRAFT, V-1 AIRCRAFT (U)

THE REPORT PRESENTS THE GROUND LOADS MEASURED ON AN INSTRUMENTED OV-1 AIRPLANE DURING LANDINGS ON SMOOTH AND ROUGH FIELDS. TEST RESULTS FOR THREE LANDINGS ARE COMPARED WITH THE RESULTS OF DYNAMIC LOADS COMPUTATIONS PERFORMED ON A DIGITAL COMPUTER. THE COMPUTING PROGRAM IS ALSO USED TO CALCULATE THE LOADS WHICH WOULD HAVE BEEN OBTAINED BY LANDINGS AND ROLLOUTS ON THE ROUGHEST PORTIONS OF TWO FIELDS WHOSE CONTOURS WERE MEASURED. FAILING LOADS WERE OBTAINED ON ONE FIELD ONLY. THE EQUATIONS OF MOTION FOR THE COMPUTER PROGRAM ARE PRESENTED. RECOMMENDATIONS ARE MADE FOR FUTURE INVESTIGATIONS THAT WILL IMPROVE THE ANALYTICAL PROCEDURES. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-740 063 17/7
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J

EVALUATION OF STOL INSTRUMENT LANDING SYSTEM (TALAR IV). (U)

DESCRIPTIVE NOTE: FINAL REPT. JUL 70-JUL 71, APR 72 45P ADAMS,GLEN D. ;
REPT. NO. FAA-NA-72-27
PROJ: FAA-320-114-05X
MONITOR: FAA-RD 72-15

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADAR LANDING CONTROL, SHORT TAKE-OFF PLANES), AIRCRAFT LANDINGS, K BAND, GLIDE PATH SYSTEMS, ACCEPTABILITY, INSTRUMENT LANDINGS (U)
IDENTIFIERS: *INSTRUMENT LANDING SYSTEMS, TALAR 4 RADAR, TALAR(TACTICAL LANDING APPROACH RADAR), TACTICAL LANDING APPROACH RADAR (U)

TALAR IV OPERATES AT 15.5 GHZ (KU-BAND MAGNETRON OUTPUT), PROVIDING LOCALIZER AND GLIDE SLOPE SIGNALS FOR APPROACH GUIDANCE FOR AIRCRAFT EQUIPPED WITH A RECEIVER. THE FAA UNITS WERE MODIFIED TO PROVIDE GLIDE SLOPE ANGLES BETWEEN 6 DEGREES AND 9 DEGREES, TO INCLUDE A TRANSMITTER MONITOR, AND TO TRANSMIT AN IDENTIFICATION CODE. THE MAGNETRON LIFE IS ABOUT 500 HOURS. THE MONITOR IS INADEQUATE BECAUSE OF DRIFT, BUT OVERALL THE TALAR HAS BEEN A RELIABLE AND USEFUL TOOL. THE GUIDANCE SIGNALS ARE GENERALLY OF GOOD QUALITY. THE TRANSMITTER LOCATION, IN RELATION TO THE RUNWAY, AFFECTS THE PILOT'S ABILITY TO SET THE AIRCRAFT DOWN AT THE DESIRED TOUCHDOWN POINT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-740 476 1/3 20/4 1/1
DAYTON UNIV OHIO RESEARCH INST

METHOD FOR THE PREDICTION OF PERFORMANCE OF STOL HIGH LIFT SYSTEMS NEAR MAXIMUM LIFT COEFFICIENT. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN-SEP 71, DEC 71 54P BAUER,PAUL T. ;
CONTRACT: F3361 5-70-C-1019
PROJ: AF-1366
TASK: 136617
MONITOR: AFFDL TR-71-169

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIFT, *FLOW SEPARATION), (*SHORT TAKE-OFF PLANES, LIFT), MATHEMATICAL PREDICTION, TURBULENT BOUNDARY LAYER, FLOW FIELDS, MATHEMATICAL MODELS (U)
IDENTIFIERS: *MAXIMUM LIFT COEFFICIENT (U)

POTENTIAL FLOW AND BOUNDARY LAYER METHODS ARE IDENTIFIED AND DEVELOPED FOR THE ANALYTIC CALCULATION OF THE PERFORMANCE OF LIFT SYSTEMS WITH SIGNIFICANT FLOW SEPARATION. PARTICULAR EMPHASIS IS GIVEN TO THE USE OF THE PRESENTED METHODS IN THE CALCULATION OF THE FLOW FIELD FOR A SINGLE AIRFOIL IN DEMONSTRATION OF THEIR CAPABILITY. A PROCEDURE FOR APPLICATION TO MULTIPLE ELEMENT HIGH LIFT SYSTEMS IS INDICATED. SPECIAL CONSIDERATION IS GIVEN TO THE REPRESENTATION OF TURBULENT SEPARATING BOUNDARY LAYERS AND AN EMPIRICAL COMPUTATIONAL PROCEDURE HAS BEEN DEVELOPED WHERE NONE HAD PREVIOUSLY EXISTED. THE WORK PRESENTED HEREIN PROVIDES A THOROUGH BASIS ON WHICH TO DEVELOP AN ACCURATE COMPUTER SIMULATION MODEL OF HIGH LIFT SYSTEMS WITH SIGNIFICANT FLOW SEPARATION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-742 093 1/5 8/6
DAYTON UNIV OHIO RESEARCH INST

RUNWAY DISTRIBUTION STUDY (SELECTED COUNTRIES). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. SEP 70-SEP 71,
SEP 71 337P BOEHMER,ROBERT P. ;
REPT. NO. UDRI-TR-71-48
CONTRACT: F33615-71-C-1075

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-742 096.

DESCRIPTORS: (*LANDING FIELDS, *SHORT TAKE-OFF PLANES), (*SOUTHEAST ASIA: LANDING FIELDS), (*SOUTH AMERICA, LANDING FIELDS), (*AFRICA, LANDING FIELDS), (*EASTERN EUROPE, LANDING FIELDS), RUNWAYS, MAPPING, ADVANCED PLANNING, POSITION FINDING, TERRAIN INTELLIGENCE (U)
IDENTIFIERS: FOB(FORWARD OPERATING BASES), FORWARD OPERATING BASES, MOB(MAIN OPERATING BASES), MAIN OPERATING BASES, COMPUTER AIDED ANALYSIS (U)

THE PURPOSE OF THIS STUDY WAS TO ESTABLISH THE DISTRIBUTION OF MAIN OPERATING BASES (MOB) AND FORWARD OPERATING BASES (FOB) WITHIN 44 SELECTED COUNTRIES. EACH COUNTRY WAS DIVIDED INTO CELLS OF EQUAL AREA AND THE DISTRIBUTIONS OF THE RUNWAYS ARE WITH RESPECT TO THE MIDPOINTS OF THE CELLS. THE REPORT GRAPHICALLY PRESENTS THE AIRFIELD DISTRIBUTIONS GENERATED BY THIS STUDY. THE RESULTS ARE TO BE USED IN CONJUNCTION WITH AN AIRLIFT STUDY TO DETERMINE THE EFFECTIVENESS OF STOL AND VTOL AIRCRAFT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-742 096 1/5 8/6
DAYTON UNIV OHIO RESEARCH INST

RUNWAY DISTRIBUTION STUDY (EUROPEAN COUNTRIES). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 72 173P BOEHMER,ROBERT P. ;
REPT. NO. UDRI-TR-72-22
CONTRACT: F33615-72-C-1049

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-742 093.

DESCRIPTORS: (*LANDING FIELDS, *WESTERN EUROPE), (*SHORT TAKE-OFF PLANES, LANDING FIELDS), RUNWAYS, MAPPING, ADVANCED PLANNING, POSITION FINDING, TERRAIN INTELLIGENCE (U)
IDENTIFIERS: FOB(FORWARD OPERATING BASES), FORWARD OPERATING BASES, MOB(MAIN OPERATING BASES), MAIN OPERATING BASES, COMPUTER AIDED ANALYSIS (U)

THE PURPOSE OF THIS STUDY WAS TO ESTABLISH THE DISTRIBUTION OF MAIN OPERATING BASES (MOB) AND FORWARD OPERATING BASES (FOB) WITHIN 18 EUROPEAN COUNTRIES. EACH COUNTRY WAS DIVIDED INTO CELLS OF EQUAL AREA AND THE DISTRIBUTIONS OF THE RUNWAYS ARE WITH RESPECT TO THE MIDPOINTS OF THE CELLS. THE REPORT GRAPHICALLY PRESENTS THE AIRFIELD DISTRIBUTIONS GENERATED BY THIS STUDY. THE RESULTS ARE TO BE USED IN CONJUNCTION WITH AN AIRLIFT STUDY TO DETERMINE THE EFFECTIVENESS OF STOL AND VTOL AIRCRAFT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-742 314 1/3
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

DESIGN OF A LONGITUDINAL FLIGHT CONTROL SYSTEM FOR A STOL TRANSPORT IN THE LANDING CONFIGURATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
MAR 72 121P HAMILTON,EDWIN L. ;
REPT. NO. GE/EE/72-13

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLIGHT CONTROL SYSTEMS, DESIGN), (*SHORT TAKE-OFF PLANES, FLIGHT CONTROL SYSTEMS), PITCH(MOTION), CONTROL SYSTEMS, STABILITY, FLIGHT PATHS, EQUATIONS OF MOTION, AIRCRAFT LANDINGS, THESES (U)
IDENTIFIERS: CONTROL THEORY, COMPUTER AIDED ANALYSIS (U)

THE LONGITUDINAL DYNAMICS OF A MEDIUM STOL TRANSPORT ARE STUDIED TO DETERMINE THE AUGMENTATION NECESSARY TO PROVIDE AN ACCEPTABLE LONGITUDINAL FLIGHT CONTROL SYSTEM, AND A FLIGHT CONTROL SYSTEM IS SYNTHESIZED AND EVALUATED. WIND TUNNEL DATA IS ANALYZED AND AN OPERATING ENVELOPE IS DEFINED. LONGITUDINAL HANDLING QUALITIES OF THE UNAUGMENTED AIRCRAFT ARE COMPARED TO AIR FORCE REQUIREMENTS, AND DESIGN CRITERIA ARE FORMULATED. A LONGITUDINAL FLIGHT CONTROL SYSTEM WHICH UTILIZES PARALLEL ACTUATION OF BOTH ELEVATOR AND DIRECT-LIFT CONTROL SPOILERS THROUGH MOVEMENT OF THE PILOT'S STICK IS SYNTHESIZED USING ROOT LOCUS TECHNIQUES. THE SYSTEM IS BASED UPON CONTROL OF THE FLIGHT PATH. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-742 463 13/2 1/3 1/5
AMERICAN AIRLINES NEW YORK

AIRLINE VIEW OF STOL SYSTEM REQUIREMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.
FEB 72 172P
REPT. NO. AAL-ER/D-56
MONITOR: DOT-OS 10075

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIR TRANSPORTATION, ADVANCED PLANNING), (•SHORT TAKE-OFF PLANES, •TERMINAL FLIGHT FACILITIES), COMMERCIAL PLANES, AIRCRAFT LANDINGS, TAKE-OFF, FLIGHT PATHS, COSTS, SITE SELECTION, MANAGEMENT PLANNING, DECISION MAKING (U)
IDENTIFIERS: •MANAGEMENT INFORMATION SYSTEMS (U)

CONVENTIONAL AIR AND RAIL SYSTEMS ARE INCAPABLE OF PROVIDING NEEDED SHORT-HAUL SERVICE FOR THE INCREASED CAPACITY REQUIREMENTS OF THE NEAR FUTURE. SOME IMPROVEMENTS CAN BE MADE BUT A NEW, INTEGRATED SHORT-HAUL TRANSPORTATION SYSTEM MAY BE NEEDED TO SUPPLEMENT THE PRESENT SYSTEM. THE COMPLEXITY AND MAGNITUDE OF THE PROBLEM REQUIRE SIGNIFICANT LEADERSHIP AND FUNDING BY THE FEDERAL GOVERNMENT. THE AIRLINES' AREAS OF CONCERN INCLUDE THE AIRCRAFT, STOLPORTS, ATC, MARKETING, SAFETY, ECONOMICS, AND ACCEPTANCE BY PASSENGERS AND STOLPORT NEIGHBORS. THIS PAPER ADDRESSES REDUCED TAKEOFF AND LANDING (RTOL), PROPELLER STOL TRANSPORT (PST), JET STOL TRANSPORT (JST), ATC, STOLPORT SITING, ROUTE ANALYSIS, CERTIFICATION AND SAFETY, AIRLINE SERVICE REQUIREMENTS, ECONOMICS, METROFLIGHT DEMONSTRATION NEED, STOLPORT ACCEPTANCE, PUBLIC DEMAND STIMULATION AND STOL DEVELOPMENT SYSTEM MANAGEMENT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-743 257 1/1 20/4
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

AERODYNAMICS OF WING-SLIPSTREAM INTERACTION: A NUMERICAL STUDY. (U)

SEP 71 86P ELLIS.N. D. :
REPT. NO. UTIAS-169
CONTRACT: AF-AFOSR-1885-70
PROJ: AF-9781
TASK: 978102
MONITOR: AFOSR TR-71-3086

UNCLASSIFIED REPORT

DESCRIPTORS: (*THIN WINGS, LIFT), (*SHORT TAKE-OFF PLANES, THIN WINGS), FLOW FIELDS, VERTICAL TAKE-OFF PLANES, VORTICES, PROPELLERS(AERIAL), INTERFERENCE, EQUATIONS OF MOTION, NUMERICAL METHODS AND PROCEDURES, PROGRAMMING(COMPUTERS), THEORY, EXPERIMENTAL DATA, CANADA (U)
IDENTIFIERS: *WING SLIPSTREAM INTERACTIONS (U)

A FUNDAMENTAL THEORY OF WING-SLIPSTREAM INTERACTION ACCOUNTS FOR SLIPSTREAMS OF ARBITRARY CROSS-SECTION BY MEANS OF VORTEX SHEATHS. THESE SHEATHS TOGETHER WITH THE WING CIRCULATION PATTERN ARE DICTATED BY THE BOUNDARY CONDITIONS; THE ANALYSIS LEADS TO SIMULTANEOUS INTEGRAL EQUATIONS FOR THEIR DETERMINATION. IN A MULTIPLE LIFTING LINE APPROXIMATION THESE ARE ULTIMATELY REDUCED TO SIMULTANEOUS LINEAR ALGEBRAIC EQUATIONS FOR MACHINE INVERSION. PROGRAMS FOR DIGITAL COMPUTER HAVE BEEN DEVELOPED FOR THE CASE OF ROUND SLIPSTREAMS DISTRIBUTED WITH LATERAL SYMMETRY ON A RECTANGULAR WING. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-743 555 17/7 1/3
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J

EVALUATION OF STOL MODULAR INSTRUMENT LANDING SYSTEM (MODILS). (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 70-JUL 71,
MAY 72 54P ADAMS,GLEN D. I
REPT. NO. FAA-NA-72-11
PROJ: FAA-320-114-02X
MONITOR: FAA-RD 72-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*GLIDE PATH SYSTEMS; RELIABILITY(ELECTRONICS)), (*SHORT TAKE-OFF PLANES; *INSTRUMENT LANDINGS); C BAND; DISTANCE-MEASURING EQUIPMENT; MICROWAVE EQUIPMENT, TRANSMITTER-RECEIVERS, AIRCRAFT ANTENNAS, PROPORTIONAL NAVIGATION; FLIGHT TESTING (U)
IDENTIFIERS: MODILS(MODULAR INSTRUMENT LANDING SYSTEMS), MODULAR INSTRUMENT LANDING SYSTEMS, EVALUATION (U)

THE FAA PROCURED TWO MODULAR INSTRUMENT LANDING SYSTEM (MODILS) GROUND STATIONS FOR SHORT TAKE-OFF AND LANDING (STOL) OPERATIONAL EVALUATION. MODILS OPERATES AT 5.2 GHZ (C-BAND SOLID-STATE TRANSMITTER), PROVIDING LOCALIZER AND GLIDE SLOPE SIGNALS, FROM A COMMON SITE, FOR APPROACH GUIDANCE TO AIRCRAFT EQUIPPED WITH A MODILS RECEIVER. PROPORTIONAL GUIDANCE IS PROVIDED FROM 3 DEGREES TO 12 DEGREES ELEVATION AND ABOUT PLUS OR MINUS 30 DEGREES IN AZIMUTH. THE PILOT MAY SELECT HIS GLIDE SLOPE ANGLE IN INCREMENTS OF 0.1 DEGREES, AND ONE OF THREE LOCALIZER COURSES; PARALLEL TO RUNWAY CENTERLINE, 2 DEGREES SKEW ONE SIDE AND 6 DEGREES SKEW THE OTHER SIDE. THE PILOT MAY ALSO SELECT HIS INDICATOR SENSITIVITIES. AN INTEGRAL DISTANCE MEASURING EQUIPMENT (DME) IS INCLUDED WHICH PROVIDES READOUTS TO 0.01 NMI. THE SYSTEM PROVIDES GOOD QUALITY GUIDANCE SIGNALS TO ADEQUATELY SUPPORT CATEGORY I TYPE (200-FOOT DECISION HEIGHT) OPERATIONS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-743 829 1/3 1/2
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

STATIC AND DROP TESTS OF A QUARTER SCALE MODEL OF THE CC-115 AIRCRAFT EQUIPPED WITH AN AIR CUSHION LANDING SYSTEM. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.;
JAN 72 44P VAUGHN,JOHN C. , III;
CAMPBELL,SHADE ;POOL,DAVID J. ;
REPT. NO. AFFDL-TM-72-01-FEM

UNCLASSIFIED REPORT

DESCRIPTORS: (•SHORT TAKE-OFF PLANES, •AIRCRAFT LANDINGS), AIRPLANE MODELS, DROP TESTING, GROUND EFFECT MACHINES, HOVERING, TEST EQUIPMENT, TEST METHODS (U)
IDENTIFIERS: CC-115 AIRCRAFT, ACLS(AIR CUSHION LANDING SYSTEMS), AIR CUSHION LANDING SYSTEMS (U)

STATIC LOAD DEFLECTION TESTS AND VERTICAL DROP TESTS WERE PERFORMED ON A QUARTER SCALE MODEL OF A CANADIAN CC-115 (BUFFALO) AIRCRAFT EQUIPPED WITH AN AIR CUSHION LANDING SYSTEM (ACLS). THE MODEL WEIGHED 610 LBS AND THE ACLS AIR SUPPLY WAS FURNISHED BY TWO ELECTRIC FANS. THE STATIC LOAD DEFLECTION TESTS SHOWED THAT THE MODEL WEIGHT COULD BE INCREASED FROM 610 LBS TO 1310 LBS BEFORE THE FANS STALLED. THE MODEL DEFLECTION ONE INCH WHEN 560 LBS WERE ADDED TO IT DURING HOVER OVER A SOLID SURFACE. THE PORTION OF THE WEIGHT SUPPORTED BY THE TRUNK (INSTEAD OF THE CUSHION) INCREASED FROM 3% AT 610 LBS TO 24% AT 1310 LBS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-744 104 1/3
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

A STUDY OF THE EFFECTS OF PARAMETER VARIATION ON THE FLYING QUALITIES OF THE XV-4B V/STOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., OCT 67-OCT 69, MAR 72 133P JONES, ARTHUR G. ;
REPT. NO. AFFDL-TR-72-44
PROJ: AF-82190712

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), HOVERING, PITCH(MOTION), STABILITY, ROLL, AERODYNAMIC CHARACTERISTICS, MATHEMATICAL ANALYSIS (U)
IDENTIFIERS: V-4 AIRCRAFT, XV-4B AIRCRAFT, TRANSITION FLIGHT (U)

THE DOMINATING INFLUENCE OF THE PROPULSION SYSTEM ON THE DYNAMIC MOTION OF A V/STOL AIRCRAFT OPERATING IN THE HOVER OR LOW-VELOCITY FLIGHT MODES HAS GREATLY INCREASED THE DIFFICULTY OF DEVELOPING SUCH AN AIRCRAFT TO BE STABLE AND CONTROLLABLE DURING THESE MODES. SMALL VARIATIONS IN STABILITY DERIVATIVES CAUSED BY EITHER CHANGES IN THE PROPULSIVE SYSTEM OR ERRORS IN MEASUREMENT OR ANALYTICAL PREDICTION PROGRAMS HAVE BEEN SHOWN TO CAUSE SIGNIFICANT CHANGES IN THE DYNAMIC CHARACTERISTICS OF SUCH AIRCRAFT. TO BETTER UNDERSTAND RELATIONSHIPS, A PROGRAM WAS PERFORMED USING THE LOCKHEED XV-4B JET-LIFT AIRCRAFT AS A SUBJECT CONFIGURATION. DURING THIS PROGRAM, THE MAGNITUDES OF TEN OF THE STABILITY DERIVATIVES USED TO DESCRIBE THE AIRCRAFT WERE VARIED INDIVIDUALLY, AND THE CHANGE IN THE ROOTS OF THE LINEARIZED, UNCOUPLED EQUATIONS OF MOTION NOTED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD 807 591 1/4
... SIEGLER INC GRAND RAPIDS MICH INSTRUMENT DIV

RESEARCH AND DEVELOPMENT OF A CONTROL-DISPLAY SUBSYSTEM FOR A TACTICAL V/STOL WEAPON SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 65-MAY 66, DEC 66 86P FELLINGER,JERRY G. ; HARDWICKE,ROGER M. ;
REPT. NO. GRR-66-1221
CONTRACT: AF 33(615)-2540
PROJ: AF-6193
TASK: 619011
MONITOR: AFFDL TR-66-118

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, FLIGHT INSTRUMENTS), (*SHORT TAKE-OFF PLANES, FLIGHT INSTRUMENTS), FEASIBILITY STUDIES, FLIGHT SIMULATORS, DISPLAY SYSTEMS, INSTRUMENT PANELS, PROGRAMMING(COMPUTERS), COMPUTER LOGIC, ATTITUDE INDICATORS, COURSE INDICATORS, HOVERING, CATHODE RAY TUBES, TACTICAL WEAPONS, FLIGHT CONTROL SYSTEMS, INSTRUMENT LANDINGS, FLIGHT SPEED INDICATORS (U)
IDENTIFIERS: LIFT ENGINES, CRUISE ENGINES (U)

THIS REPORT DESCRIBES A 12-MONTH STUDY EFFORT TO INVESTIGATE THE REQUIREMENTS OF V/STOL CONTROL-DISPLAY SYSTEMS. DURING THE EVALUATION PHASE A FIXED-BASE, DYNAMIC SIMULATOR WAS USED TO REPRESENT A V/STOL AIRCRAFT WITH FOUR LIFT ENGINES AND TWO CRUISE ENGINES. THE LOW SPEED FLIGHT REGIMES, PARTICULARLY THE LANDING TRANSITION, RECEIVED PRIMARY EMPHASIS. CONTROLLED EXPERIMENTS WERE CONDUCTED TO EVALUATE FOUR SEPARATE HOVER INDICATOR CONCEPTS INCLUDING HORIZONTAL SITUATION INDICATOR, CATHODE RAY TUBE, ATTITUDE DIRECTOR INDICATOR, AND ELECTROLUMINESCENT CROSS-GRID DISPLAYS. THESE EXPERIMENTS INDICATED THAT IFR APPROACHES WITH V/STOL AIRCRAFT CAN BE MADE SAFELY AND EFFICIENTLY AND THAT THE CONTROL-DISPLAY SYSTEM HAS A SIGNIFICANT EFFECT OF FUEL CONSUMPTION, LANDING SITE REQUIREMENTS, AND PILOT PERFORMANCE IN MAKING LANDING APPROACHES. RESULTS OF INTEGRATED FLIGHT CONTROL SYSTEM REQUIREMENTS ANALYSIS ARE DISCUSSED AND PRELIMINARY DESIGNS OF FLIGHT DIRECTOR AND AUTOPILOT SYSTEMS ARE DESCRIBED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-807 697 1/4
HONEYWELL INC MINNEAPOLIS MINN SYSTEMS AND RESEARCH CENTER

DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL TACTICAL AIRCRAFT. VOLUME I. ANALYSES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUN 65-1 JUN 66.
DEC 66 139P OLSON, BERNARD A.
REPT. NO. 12512-FR1-VOL-1
CONTRACT: AF 33(615)-2527
PROJ: AF-6190
TASK: 6190011
MONITOR: AFFDL TR-66-114-VOL-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, DISPLAY SYSTEMS), (*VERTICAL TAKE-OFF PLANES, DISPLAY SYSTEMS), FLIGHT INSTRUMENTS, TACTICAL WEAPONS, SIMULATION, LEVEL FLIGHT, HOVERING, AIRCRAFT LANDINGS, PROGRAMMING(COMPUTERS), TAKE-OFF, DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS, PROGRAMMING LANGUAGES, INSTRUMENT LANDINGS. (U)
IDENTIFIERS: FORTRAN (U)

A STUDY OF THE DISPLAY/CONTROL REQUIREMENTS FOR A TACTICAL V/STOL AIRCRAFT WAS CONDUCTED USING ANALYTICAL AND SIMULATION TECHNIQUES. WORKLOAD LEVELS WERE CALCULATED BY THE DISCONTINUOUS CONTROL ANALYSIS TECHNIQUE FOR THE V/STOL CREW'S DISCRETE TASKS. PILOT WORKLOAD LEVELS WERE EMPIRICALLY ESTABLISHED FOR LEVEL AERODYNAMIC FLIGHT, TRANSITION TO HOVER, HOVER, AND LANDING FROM HOVER. A SCIENTIFIC DATA SYSTEMS 9300 HYBRID COMPUTER WAS USED TO SIMULATE THE UNIQUE MISSION PHASES OF A V/STOL AIRCRAFT. THE STOL LANDING AND TAKEOFF MISSION PHASES WERE ALSO SIMULATED. THREE LANDING DISPLAY FORMATS, TWO MANUAL CONTROL MODES, THREE THRUST-TO-WEIGHT RATIOS AND THREE WIND CONDITIONS WERE EVALUATED. A LANDING DISPLAY FORMAT WAS DEVELOPED THAT WAS DEMONSTRATED ON THE HYBRID SIMULATION TO BE FEASIBLE FOR OPERATING A V/STOL IFR WITH MINIMUM ELECTRONIC AIDS ON THE GROUND AND LESS THAN 100 PERCENT PILOT WORKLOAD. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-807 698 1/4
HONEYWELL INC MINNEAPOLIS MINN SYSTEMS AND RESEARCH CENTER

DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL TACTICAL AIRCRAFT. VOLUME II. APPENDIXES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUN 65-1 JUN 66,
DEC 66 203P OLSON,BERNARD A. ;
REPT. NO. 12512-FR1-VOL-2
CONTRACT: AF 33(615)-2527
PROJ: AF-6190
TASK: 6190011
MONITOR: AFFDL TR-66-114-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, DISPLAY SYSTEMS), (*VERTICAL TAKE-OFF PLANES, DISPLAY SYSTEMS), FLIGHT INSTRUMENTS, INSTRUMENT LANDINGS, SIMULATION, LEVEL FLIGHT, HOVERING, AIRCRAFT LANDINGS, PROGRAMMING(COMPUTERS), TAKE-OFF, DIGITAL COMPUTERS, DATA PROCESSING SYSTEMS, TACTICAL WEAPONS, PROGRAMMING LANGUAGES (U)
IDENTIFIERS: FORTRAN (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-809 185 1/3 20/4
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

AN ANALYTICAL METHOD OF DETERMINING GENERAL DOWNWASH FLOW FIELD PARAMETERS FOR V/STOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. APR-AUG 66,
NOV 66 61P HOHLER,DAVID J. I
REPT. NO. AFAPL-TR-66-90
PROJ: AF-8174
TASK: 817401

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, DOWNWASH), (*SHORT TAKE-OFF PLANES, DOWNWASH), EXHAUST GASES, GRAPHICS, EQUATIONS, FLOW FIELDS, PERFORMANCE(ENGINEERING), MATHEMATICAL ANALYSIS, VELOCITY, EXPERIMENTAL DATA, TERRAIN, PRESSURE, MATHEMATICAL PREDICTION, HAZARDS (U)

THIS REPORT PRESENTS A METHOD OF ANALYTICALLY DETERMINING THE GENERAL DOWNWASH FLOW FIELD PARAMETERS OF VARIOUS TYPES OF V/STOL AIRCRAFT. THE BASIC DIFFERENCE BETWEEN THE OPERATION OF V/STOL AIRCRAFT AND CONVENTIONAL AIRCRAFT IS THEIR METHOD OF TAKE-OFF AND LANDING. DURING THESE OPERATIONS, V/STOL AIRCRAFT PRODUCE HIGH DOWNWASH AIR VELOCITIES THAT IMPINGE AND SPREAD OUT OVER THE SURFACE OF THE GROUND. DEPENDING ON THE SIZE, TYPE, AND NUMBER OF ENGINES ON THE AIRCRAFT, THIS DOWNWASH CAN CAUSE DAMAGE TO NEARBY AIRCRAFT, EQUIPMENT, OR PERSONNEL. PAST THEORETICAL METHODS BASED ON INCOMPRESSIBLE FLOW THEORY HAVE BEEN UNSUCCESSFUL IN ESTABLISHING A MEANS OF COMPUTING THIS DOWNWASH FLOW FIELD. A COMBINED METHOD, HOWEVER, OF PROVEN EXPERIMENTAL DATA AND CERTAIN ANALYTICAL APPROACHES HAVE YIELDED A USEFUL MEANS OF PREDICTING THE GENERAL DOWNWASH FLOW FIELD PARAMETERS. THIS REPORT PRESENTS THESE APPROACHES AND DEMONSTRATES THEIR USEFULNESS. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-818 980 1/3 1/5
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

PILOT STUDY OF RESPONSE OF CV-2 AIRCRAFT TO IRREGULAR TERRAIN. (U)

DESCRIPTIVE NOTE: FINAL REPT. SEP-OCT 65, JUL 67 108P GREEN,ANDREW J. , JR.;
RUSH,EDGAR S. ;
REPT. NO. AEWES-TR-3-790
PROJ: DA-1-V-0-21701-A-047

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *LANDING FIELDS), CANADA, TERRAIN, SURFACE ROUGHNESS, TAKE-OFF, AIRCRAFT LANDINGS, TAXIING, MATHEMATICAL PREDICTION, COMPUTER PROGRAMS, MATHEMATICAL MODELS, FLIGHT TESTING, LANDING GEAR, RESPONSES, ARMY AIRCRAFT (U)
IDENTIFIERS: V-2 AIRCRAFT (U)

THE INVESTIGATION REPORTED HEREIN WAS A PILOT STUDY UNDERTAKEN TO DEVELOP MEANS OF PREDICTING THE PERFORMANCE OF A CV-2 AIRCRAFT ON IRREGULAR TERRAIN AND OF QUANTIFYING SURFACE ROUGHNESS. SPECIAL TESTS WERE CONDUCTED TO ASCERTAIN THE NATURAL FREQUENCY AND DAMPING CHARACTERISTICS IN BOTH THE VERTICAL AND HORIZONTAL DIRECTIONS OF THE ELEMENTS OF THE AIRCRAFT. LANDING, TAKEOFF, AND TAXI TESTS WERE CONDUCTED AT 15 FIELD SITES IN THREE GENERAL AREAS; ACCELEROMETERS AND STRAIN GAGES WERE USED TO RECORD RESPONSES OF 12 CRITICAL COMPONENTS OF THE AIRCRAFT. SIMPLE MATHEMATICAL MODELS TO PREDICT THE DYNAMIC RESPONSES OF CERTAIN OF THE AIRCRAFT COMPONENTS WERE DEVELOPED FOR SOLUTION BY BOTH ANALOG AND DIGITAL COMPUTERS AND WERE VERIFIED BY COMPARISON WITH MEASURED DATA. BECAUSE OF CERTAIN ASSUMPTIONS USED IN THE DEVELOPMENT OF THE MODELS, THE PREDICTED DATA DID NOT AGREE EXACTLY WITH THE ACTUAL DATA. ALTHOUGH THE PREDICTIONS WERE OF USEFUL ACCURACY, IT IS RECOMMENDED THAT AN ANALOG MODEL, EXCITED BY MEASURED TERRAIN DATA, BE USED TO DETERMINE THE ADEQUACY OF A SURFACE FOR LANDINGS OF THE CV-2 AIRCRAFT. TO OBTAIN THE TERRAIN INPUT, AN OUTRIGGER TRAILER DYNAMOMETER WITH AN ACTUAL PROTOTYPE AIRCRAFT TIRE AS THE TERRAIN FOLLOWER IS PROPOSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-819 971 1/3 20/4 5/5
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL II. DYNAMIC LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT, JUNE 26-28, BUFFALO, N.Y. (U)

63 291P

UNCLASSIFIED REPORT

DESCRIPTORS: (*HELICOPTERS, AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC LOADING), (*SHORT TAKE-OFF PLANES, SYMPOSIA), ARMY AIRCRAFT, WIND TUNNEL MODELS, AIRPLANE MODELS, FLIGHT TESTING, STRESSES, LEVEL FLIGHT, TRANSPORT PLANES, TILT WINGS, STRUCTURAL PROPERTIES, PROPELLERS(AERIAL), FLUTTER, MILITARY REQUIREMENTS, DRIVE SHAFTS, VIBRATION, DATA PROCESSING SYSTEMS, ROTOR BLADES(ROTARY WINGS), ROTARY WINGS, MAN-MACHINE SYSTEMS, HUMAN ENGINEERING, GUST LOADS, LOADING(MECHANICS), AIRCRAFT LANDINGS (U)
IDENTIFIERS: C-142 AIRCRAFT, GUST ALLEVIATION (U)

CONTENTS: A REVIEW OF THE STRUCTURAL DYNAMIC CHARACTERISTICS OF THE XC-142A AIRCRAFT; PROPELLER WHIRL FLUTTER CONSIDERATIONS FOR V/STOL AIRCRAFT; HIGH-SPEED SHAFTING FOR POWER TRANSMISSION IN AIRCRAFT; DYNAMIC TORSIONAL PROBLEMS IN VTOL DRIVE TRAINS WITH UNIVERSAL JOINTS; RECENT WORK AT THE ROYAL AIRCRAFT ESTABLISHMENT ON HELICOPTER DYNAMIC LOADS, WITH PARTICULAR REFERENCE TO HIGH BLADE INCIDENCE PROBLEMS; SOME RESULTS FROM THE ARMY LOW ALTITUDE, HIGH-SPEED FLIGHT PROGRAM (MAN-MACHINE); HUMAN FACTOR PROBLEMS ASSOCIATED WITH LOW ALTITUDE HIGH-SPEED (LAHS) FLIGHT; EFFECT OF GUST ALLEVIATION SYSTEM ON DYNAMIC AIRLOADS; AND AN ANALYTICAL INVESTIGATION OF AIRCRAFT LOADS INDUCED BY ROUGH TERRAIN LANDINGS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-819 972 1/3 20/4
ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL III. DYNAMIC LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT, JUNE 26-28, BUFFALO, N.Y. (U)

63 101P

UNCLASSIFIED REPORT

DESCRIPTORS: (*HELICOPTERS, AERODYNAMIC CHARACTERISTICS), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC LOADING), (*SHORT TAKE-OFF PLANES, SYMPOSIA), ARMY AIRCRAFT, DUCTED FANS, AXIAL-FLOW FANS, RESEARCH PLANES, TRANSPORT PLANES, STRESSES, AIRCRAFT INDUSTRY, WING-BODY CONFIGURATIONS, ROTOR BLADES(ROTARY WINGS), ROTARY WINGS, STRUCTURAL PROPERTIES, VIBRATION, HELICOPTER ROTORS, BLADE AIRFOILS, HARMONIC ANALYSIS, LOADING(MECHANICS), DRIVE SHAFTS, TILT WINGS, FUSELAGES, FLUTTER, PROPELLERS(AERIAL), VECTOR ANALYSIS (U)
IDENTIFIERS: LIFT ENGINES, C-130 AIRCRAFT, V-4 AIRCRAFT, V-5 AIRCRAFT, TRANSITION FLIGHT, HELICOPTER BLADE TIPS, C-142 AIRCRAFT, H-21 AIRCRAFT (U)

CONTENTS: PRESENT AND FUTURE HELICOPTER DYNAMIC LOADS RESEARCH; DYNAMIC LOADS PROBLEMS; STATUS OF HELICOPTER DYNAMIC LOAD PROBLEMS AT HILLER AIRCRAFT COMPANY; DYNAMIC LOADS RESEARCH; HELICOPTER DYNAMIC LOADS RESEARCH REQUIREMENTS; DYNAMIC LOAD PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT; UNRESOLVED DYNAMIC LOADS PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT OF CONVENTIONAL STRUCTURAL CONFIGURATIONS; DYNAMIC LOAD PROBLEMS ASSOCIATED WITH V/STOL AIRCRAFT; TWO XV-5A DYNAMIC LOAD CHARACTERISTICS; AND DYNAMIC LOAD PROBLEMS OF V/STOL AIRCRAFT. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMOB

AD-825 451 1/3 20/4
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

THE RESPONSE OF A HOVERING V/STOL AIRCRAFT TO DISCRETE TURBULENCE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 67 116P GOGOSHA,OREST R. ;MORIARTY, THOMAS E. ;
REPT. NO. GGC/EE/67-7

UNCLASSIFIED REPORT

DESCRIPTORS: (*TRANSPORT PLANES, PERFORMANCE(ENGINEERING)), (*VERTICAL TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*SHORT TAKE-OFF PLANES, HOVERING), TURBULENCE, RESPONSE, VORTICES, SHEAR STRESSES, STABILITY, MATHEMATICAL MODELS, DIGITAL COMPUTERS, TILT WINGS, GUST LOADS, CONTROL SYSTEMS, PILOTS, TRANSFER FUNCTIONS (U)
IDENTIFIERS: C-142 AIRCRAFT (U)

THE REPORT ANALYZES THE PERFORMANCE OF THE XC-142A V/STOL AIRCRAFT IN HOVER WHEN SUBJECTED TO DISCRETE TURBULENCE INPUTS IN THE FORM OF VORTICES AND WIND SHEAR. THE AIRCRAFT AND TURBULENCE ARE REPLACED BY APPROXIMATE MATHEMATICAL MODELS AND THE RESPONSE OF THE AIRCRAFT IS CALCULATED USING A DIGITAL COMPUTER. BY USING THE RESULTS OF A SEPARATE ANALOG SIMULATION, TWO PILOT TRANSFER FUNCTIONS ARE DEVELOPED WHICH SATISFACTORILY PERFORM THE ASSIGNED STATION KEEPING TASK. CONTROL SENSITIVITIES ARE COMPUTED AND COMPARED TO MAXIMUM AVAILABLE VALUES. IT IS CONCLUDED THAT CONTROL POWER IS NOT A LIMITING FACTOR IN THE PERFORMANCE OF THE XC-142A IN HOVER. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-835 232 4/1 1/3
TRAVELERS RESEARCH CENTER INC HARTFORD CONN

TAKE-OFF AND LANDING CRITICAL ATMOSPHERIC TURBULENCE (TOLCAT) ANALYTICAL INVESTIGATION. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 67-MAR 68, MAR 68 93P BOWNE,NORMAN E. ;ANDERSON, GERALD E. ;
CONTRACT: F33615-67-C-1557
PROJ: AF-7235
MONITOR: AFFDL TR-68-23

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *CLEAR AIR TURBULENCE), ATMOSPHERIC MOTION, TAKE-OFF, AIRCRAFT LANDINGS, BOUNDARY LAYER, HANDLING, PROBABILITY, NAVIER-STOKES EQUATIONS, STRESSES, VISCOSITY, DIFFUSION, HEAT, STABILITY, VELOCITY, MODELS(SIMULATIONS), ANEMOMETERS, MEASUREMENT, LOW ALTITUDE, VERTICAL TAKE-OFF PLANES (U)
IDENTIFIERS: TOLCAT(TAKE OFF AND LANDING CRITICAL ATMOSPHERIC TURBULENCE) (U)

A REVIEW AND ANALYSIS OF CURRENT KNOWLEDGE OF TURBULENCE IN THE ATMOSPHERIC BOUNDARY LAYER IS PRESENTED. PARTICULAR EMPHASIS IS ON IDENTIFYING AND ANALYZING THE ASPECTS OF LOW ALTITUDE TURBULENCE THAT HAVE THE GREATEST INFLUENCE ON THE DESIGN AND OPERATION OF V/STOL AIRCRAFT IN THE ATMOSPHERIC BOUNDARY LAYER. THE NATURE, QUALITY AND APPLICABILITY OF REPORTED TURBULENCE MEASUREMENTS IS DISCUSSED, AND SEVERAL RESULTING EMPIRICAL DESCRIPTIONS OF THE BOUNDARY LAYER ARE COMPARED. DEFICIENCIES IN THE DATA ARE SPECIFICALLY IDENTIFIED AND DISCUSSED. THE FOUNDATIONS, ASSUMPTIONS, AND LIMITATIONS OF THE STATISTICAL ANALYSES OF BOUNDARY LAYER TURBULENCE WHICH ARE NOW IN USE ARE IDENTIFIED AND DISCUSSED. THE NATURE OF ATMOSPHERE-VEHICLE INTERACTIONS AND CURRENT AND POTENTIAL METHODS OF ANALYZING THESE INTERACTIONS ARE DISCUSSED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-838 391 1/3 12/1
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

A SIMPLE GRAPHICAL METHOD FOR EVALUATING THE EFFECT OF THRUST VECTOR TILT ON THE AIRCRAFT PERFORMANCE. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUL 68 34P BIELKOWICZ,PETER ;
MONITOR: AFIT TR-68-6

UNCLASSIFIED REPORT

DESCRIPTORS: (•VERTICAL TAKE-OFF PLANES, THRUST), (•SHORT TAKE-OFF PLANES, TILT WINGS), VECTOR ANALYSIS, ANGLE OF ATTACK, JET MIXING FLOW, DEFLECTION, NUMERICAL METHODS AND PROCEDURES, EQUATIONS OF MOTION, AERODYNAMIC CHARACTERISTICS, FLIGHT PATHS, VELOCITY (U)
IDENTIFIERS: •THRUST VECTOR TILT, GRAPHS(CHARTS) (U)

THE SEMI-GRAPHICAL METHOD PRESENTED IN THE REPORT MAY BE USEFUL FOR THE PRELIMINARY PERFORMANCE COMPUTATION FOR AN AIRCRAFT WITH THE VARIABLE THRUST AXIS TILT. APPLICATION TO DIFFERENT FLIGHT PROBLEMS IS SHOWN. OPTIMIZATION OF SOME FLIGHT PARAMETERS CAN BE ACHIEVED BY SIMPLE GRAPHICAL CONSTRUCTION. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-838 777 1/3 20/4 9/2
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

A PRELIMINARY ANALYSIS OF THE XV-4B VTOL AIRCRAFT COMPUTER SIMULATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
MAR 68 223P KELLAR,ROBERT P. ;GREEN, DONALD C. ;
REPT. NO. GAM/AE-68-4

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), RESEARCH PLANES, MATHEMATICAL MODELS, SIMULATION, STABILITY, CONTROL, ELEVATORS, AERIAL RUDDERS, HANDLING, VERTICAL TAKE-OFF PLANES, AILERONS, PITCH(MOTION), THESES, FLOW CHARTING, GROUND EFFECT (U)
IDENTIFIERS: COMPUTER SIMULATION, XV-4B AIRCRAFT, DEGREES OF FREEDOM (U)

THIS STUDY WAS A PRELIMINARY ANALYSIS TO DETERMINE THE EFFECT UPON STABILITY AND CONTROL OF THE XV-4B VTOL AIRCRAFT, DUE TO A VARIATION OF AERODYNAMIC DERIVATIVES. SOME INFORMATION IS PRESENTED ON A HYBRID COMPUTER SYSTEM WHICH WAS USED. A PITCHING MOMENT ANALYSIS WAS MADE WITH AN ELEVATOR STEP INPUT. A LATERAL-DIRECTIONAL ANALYSIS WAS MADE WITH A RUDDER AND AILERON IMPULSE. VARIATIONS WERE MADE FOR FOUR DIFFERENT FLIGHT CONDITIONS. THE AIRCRAFT WAS TRIMMED AT EACH FLIGHT CONDITION AND A NOMINAL RUN WAS RECORDED. THEN EACH DERIVATIVE WAS VARIED, ONE AT A TIME, AND THE RESULTS RECORDED. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDH08

AD-838 823 1/3 20/4
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

THE AERODYNAMIC CHARACTERISTICS OF NON-AERODYNAMIC SHAPES. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 68 66P LEHMANN,MAURICE JOHN WILLIAM
;
REPT. NO. GAM/AE/68-6

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, EXTERNAL STORES), (*EXTERNAL STORES, AERODYNAMIC CHARACTERISTICS), HELICOPTERS, RECTANGULAR BODIES, CYLINDRICAL BODIES, BLUNT BODIES, LIFT, DRAG, PITCH(MOTION), ANGLE OF ATTACK, VERTICAL TAKE-OFF PLANES, FAIRINGS, STABILITY, FLOW VISUALIZATION, WIND TUNNEL MODELS, MODEL TESTS, REYNOLDS NUMBER (U)
IDENTIFIERS: NONAERODYNAMIC SHAPES, GRAPHS(CHARTS), DYNAMIC PRESSURE, LIFT DRAG RATIO (U)

A WIND TUNNEL INVESTIGATION OF THREE BASIC SHAPES (CUBES, RECTANGLES, AND CYLINDERS) WAS CONDUCTED TO DETERMINE THE AERODYNAMIC CHARACTERISTICS OF SIMILAR SHAPED CARGOS CARRIED EXTERNALLY BY HELICOPTERS OR V/STOL AIRCRAFT. THE RATIO OF SIDE AREA TO FRONTAL AREA WAS USED AS A PARAMETER TO PLOT THE LIFT, DRAG, AND PITCHING MOMENT VERSUS ANGLE OF ATTACK FOR THE THREE SHAPES. THE LIFT, DRAG, AND PITCHING MOMENT COEFFICIENTS WERE PLOTTED FOR ANGLES OF ATTACK FROM +5 DEGREES TO -90 DEGREES. THE CHANGE IN SLOPES OF THE PITCHING MOMENT OF BOTH RECTANGLES AND CYLINDERS WAS SMOOTH AND GRADUAL INDICATING NO RAPID CHANGES IN STATIC STABILITY. BY USING A VERY FLAT NOSE FAIRING, IT WAS POSSIBLE TO REDUCE THE DRAG BY 30% AT 0 DEGREES ANGLE OF ATTACK WITHOUT INCREASING THE FORCES AT THE LARGER ANGLES OF ATTACK. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-844 579 1/2 1/3
PRINCETON UNIV N J

THE PRINCETON PENNSYLVANIA ARMY AVIONICS RESEARCH PROGRAM. (U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 2, 1 JUN 67-30 JUN 68,
NOV 68 114P BORN,GERARD J. !DUKES, THEODOR A. !DURBIN,ENOCH J. !GRAHAM,FRANK D. !SCHMITZ,FREDERIC H. !
CONTRACT: DA-28-043-AMC-02412(E)
PROJ: DA-1-H-162202-A-219
TASK: 1-H-162202-A-21907
MONITOR: ECOM 02412-2

UNCLASSIFIED REPORT

DESCRIPTORS: (*HELICOPTERS, FORMATION FLIGHT), (*VERTICAL TAKE-OFF PLANES, TURNING FLIGHT), (*SHORT TAKE-OFF PLANES, EQUATIONS OF MOTION), APPROACH, AIRCRAFT LANDINGS, FLIGHT PATHS, MATHEMATICAL MODELS, TRANSFORMATIONS(MATHEMATICS), GLIDE PATH SYSTEMS, TAKE-OFF, INSTRUMENTATION, ELECTROSTATIC FIELDS (U)
IDENTIFIERS: STATION KEEPING, *MANAGEMENT INFORMATION SYSTEMS (U)

THIS SECOND ANNUAL REPORT OF WORK DONE UNDER CONTRACT DA 28-043 AMC-02412(E) IN SUPPORT OF THE USAECOM AVIONICS LABORATORY PROGRAM COVERS FIVE TASKS: (1) SIMPLE MODELING AND FUNDAMENTAL CONSIDERATIONS OF THE STATION KEEPING CONTROL LOOP ARE PRESENTED. (2) IN THIS REPORT, A PROBLEM OF CONSIDERABLE INTEREST TO PEOPLE INVOLVED WITH IMPROVING EXISTING STEADY-STATE STOL TAKE-OFF TECHNIQUES IS DISCUSSED THEORETICALLY: MINIMUM DISTANCE TO CLEAR AN OBSTACLE OF A GIVEN FIXED HEIGHT. (3) A SYSTEM STUDY OF LOW VISIBILITY APPROACH AND LANDING IS A SIMULATION OF THE CONTROL CHARACTERISTICS OF HELICOPTERS COMBINED WITH MODELED CHARACTERISTICS OF THE PILOT TO DETERMINE GUIDANCE PARAMETERS NEEDED FOR LOW VISIBILITY APPROACHES. (4) AN EXAMINATION OF INSTRUMENTATION REQUIREMENTS TO PERMIT CONTROL OF HELICOPTER AND VTOL FLIGHT PERFORMANCE. (5) RESULTS OF A PRELIMINARY SURVEY OF THE PHENOMENON OF TRIBOELECTRICITY AS IT APPLIES TO THE PROBLEM OF HELICOPTER ELECTRICAL CHARGING ARE REPORTED. (AUTHOR)
144 (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-857 455 21/5 1/3
RYAN AERONAUTICAL CO SAN DIEGO CALIF

SUGGESTED SPECIFICATION FOR A LIFT FAN PROPULSION SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 JUL 65-1 MAR 66,
MAY 69 48P DAVIS,WALTER B. ;ELA, BENJAMIN W. ;
REPT. NO. 29469-3
CONTRACT: DA-44-177-AMC-345(T)
PROJ: DA-1-F-131201-D-161
MONITOR: USAAVLABS TR-69-22

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, DUCTED FANS), (*DUCTED FANS, LIFT), TURBOJET ENGINES, SPECIFICATIONS, WINGS, DESIGN, INTERFACES (U)
IDENTIFIERS: *LIFT FANS (U)

THE REPORT PRESENTS PROPULSION SYSTEM COMPONENT DESIGN REQUIREMENTS BELIEVED TO BE NECESSARY FOR SUCCESSFUL DEVELOPMENT OF OPERATIONAL LIFT FAN AIRCRAFT. THE WORK WAS DONE FOR THE PURPOSE OF IDENTIFYING LIFT FAN AIRFRAME AND PROPULSION SYSTEM PERFORMANCE AND INSTALLATION INTERFACES. THE REQUIREMENTS PRESENTED IN THE REPORT REFLECT EXPERIENCE GAINED FROM THE XV-5A LIFT FAN AIRCRAFT FLIGHT TEST PROGRAM. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM08

AD-857 [illegible]52 1/3
AEROPHYSICS CO WASHINGTON D C

REVIEW AND PRELIMINARY EVALUATION OF LIFTING HORIZONTAL-AXIS ROTATING-WING AERONAUTICAL SYSTEMS (HARWAS). (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 69 420P FOSHAG,WILLIAM F. ;BOEHLER, GABRIEL D. ;
CONTRACT: DAAJ02-67-C-0046
PROJ: DA-1-F-162204-A-142
TASK: 1-F-162204-A-14231
MONITOR: USAAVLABS TR-69-13

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, *REVIEWS); (*ROTARY WINGS, SHORT TAKE-OFF PLANES); VERTICAL TAKE-OFF PLANES, LIFT, ROTATION, MAGNUS FORCE, AUTOROTATION, PROPELLERS(AERIAL), TURBINES, DESIGN, MARINE PROPULSION, AIRFOILS, FLAPS, GLIDERS, DECELERATION, RESEARCH PLANES (U)
IDENTIFIERS: HARWAS(HORIZONTAL AXIS ROTATING WING AERONAUTICAL SYSTEMS), *HORIZONTAL AXIS ROTATING WING AERONAUTICAL SYSTEMS, ROTARY WING AIRCRAFT, WINDMILLS, DHC-5 AIRCRAFT, C-5 AIRCRAFT, CYCLOGIRO AIRCRAFT, HELICOPLANES, X-19 AIRCRAFT, X-100 AIRCRAFT, MAGNUS EFFECT AIRFOILS (U)

AMONG THE PURELY AERONAUTICAL APPLICATIONS, NEAR-HORIZONTAL AXIS AS WELL AS HORIZONTAL AXIS DEVICES ARE CONSIDERED. THE FORMER COVER THE RADIAL-LIFT PROPELLER OR 'SELF-PROPELLING' WING; THE LATTER COVER MAGNUS EFFECT AND RELATED SYSTEMS; CYCLOGIRO SYSTEMS AND HORIZONTAL-AXIS PROPELLER SYSTEMS WITH CYCLIC PITCH. A LIMITED INVESTIGATION OF NON-AERONAUTICAL APPLICATIONS OF HARWAS IS ALSO MADE, WHICH COVERS WING-ROTOR TYPE WINDMILLS, CYCLOGIRO WINDMILL TURBINES, MAGNUS EFFECT SHIP PROPULSION AND CYCLOIDAL SHIP PROPULSION. APPROXIMATELY 1200 REFERENCES ARE LISTED. A SERIES OF CROSS-INDEX TABLES IS ALSO INCLUDED TO PROVIDE A QUICK MEANS FOR THE READER TO DETERMINE THE CONTENT AND AVAILABILITY OF THE REFERENCES. AN ANALYSIS OF THE VARIOUS LIFT SYSTEMS PERTINENT TO THE HARWAS FIELD IS MADE WITH A VIEW TO POTENTIAL AIR VEHICLE APPLICATIONS. OVER 20 ORIGINAL AERONAUTICAL APPLICATIONS ARE IDENTIFIED AND EVALUATED IN THE LIGHT OF RECENT ADVANCES IN POWER PLANTS. (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-862 843 1/3 20/4 21/5
LOCKHEED-CALIFORNIA CO BURBANK

PROPULSION STUDY FOR STOL AIR-SEA CRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT. 16 DEC 68-15 SEP 69,
SEP 69 149P ANDERSON,ARTHUR B. !BROWN,
ALAN C. !HOHMAN,EDWARD H. !
REPT. NO. LR-22620
CONTRACT: N00014-69-C-0024
PROJ: NR-212-191

UNCLASSIFIED REPORT

DESCRIPTORS: (*SHORT TAKE-OFF PLANES, AERODYNAMIC CHARACTERISTICS), (*AMPHIBIAN PLANES, *PROPULSION), OPTIMIZATION, ADVANCED PLANNING, CANARD CONFIGURATION, LIFT, PROGRAMMING(COMPUTERS), TURBOFAN ENGINES, AERODYNAMIC CONTROL SURFACES, WEIGHT, DUCTS (U)

THE PURPOSE OF THE STUDY WAS TO INVESTIGATE AERODYNAMIC-PROPULSION CONCEPTS APPLICABLE TO THE CANARD CONFIGURATION STOL AIR-SEA CRAFT, AND IN PARTICULAR TO DEVELOP AND USE A METHODOLOGY FOR OPTIMIZING COMBINATIONS OF DIRECT LIFT AND AUGMENTED WING LIFT. A COMPUTER PROGRAM WAS DEVELOPED THAT OPTIMIZED THE PROPULSION SYSTEM BY MAXIMIZING THE AIRPLANE RADIUS FOR A GIVEN MISSION AND A FIXED INITIAL AIRPLANE WEIGHT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-863 963 1/3
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THE EXHIBITION OF NEW SOVIET FIGHTERS AND FIGHTER-BOMBERS. (U)

AUG 69 14P RENDULIC,ZLATKO I
REPT. NO. FTD-HT-23-169-69
PROJ: FTD-7230178

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF VAZDUHOPLOVNI GLASNIK (YUGOSLAVIA) NI P24-34 1968.

DESCRIPTORS: (*JET FIGHTERS, USSR), (*ATTACK BOMBERS, USSR), AERODYNAMIC CHARACTERISTICS, SWEPT-BACK WINGS, DELTA WINGS, SUPERSONIC PLANES, SHORT TAKE-OFF PLANES, VERTICAL TAKE-OFF PLANES, VARIABLE-SWEEP WINGS, STATISTICAL ANALYSIS, YUGOSLAVIA (U)
IDENTIFIERS: TRANSLATIONS (U)

THIS ARTICLE DEALS WITH MATERIAL WHICH APPEARED IN FLUGWELT (NO. 12, 1967) AND INTERAVIA (NO 9, 1967) AND COVERS SOVIET FIGHTERS AND FIGHTER-BOMBERS FROM 1950 TO 1965. ILLUSTRATED ARE THE E-166 (EXPERIMENTAL PLANE FROM THE MILOYAN DESIGN GROUP), A SUKHOY SINGLE-ENGINE JET FIGHTER (MIG 21), A SUKHOY TWIN-ENGINE JET PURSUIT PLANE, A PLANE WITH VARIABLE WINGS BASED ON THE SU-7B, A LATER VERSION OF THE SAME, AND A LONG-RANGE TWIN-JET PURSUIT PLANE FLYING AT 2.8-3 TIMES THE SPEED OF SOUND. THESE PLANES ARE COMPARED IN AVAILABLE DETAIL WITH PLANES OF WESTERN MANUFACTURE. STOL AND VTOL TYPES ARE ALSO MENTIOND. THE AUTHOR NOTES THE UNUSUALLY LARGE NUMBER OF PLANES PROJECTED IN THE USSR, HE MENTIONS THE HAWKER-SIDDELEY P-1127 AS THE MOST SUCCESSFUL PLANE OF ITS TYPE AND DISCUSSES THE F-111, MIRAGE G, AND YF-11. HE CONCLUDES THAT THE LARGE NUMBER OF NEW SOVIET PROTOTYPES INDICATES THAT THE USSR IS AGAIN LAYING GREAT STRESS ON SUPPORTING AIRCRAFT. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMO8

AD-873 264 1/3
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS

PRELIMINARY INVESTIGATION OF THE COUNTER-FLOW JET FLAP. (U)

DESCRIPTIVE NOTE: FINAL ENGINEERING REPT. 2 JUN 69-1 FEB 70,
MAR 70 57P FINK,MARTIN R. ISTOEFFLER, RICHARD C. ;
REPT. NO. UACRL-J910843-3
CONTRACT: N00019-69-C-0559

UNCLASSIFIED REPORT

DESCRIPTORS: (*JET FLAPS, DESIGN), (*SHORT TAKE-OFF PLANES, JET FLAPS), LIFT, FLOW VISUALIZATION, TRAILING EDGE, MODELS(SIMULATIONS), PITCH(MOTION), JET PUMPS, WINGS (U)

PRELIMINARY EXPERIMENTAL STUDIES WERE CONDUCTED TO PROVIDE DESIGN INFORMATION FOR A THREE-DIMENSIONAL WING MODEL CONTAINING A COUNTER-FLOW JET FLAP. THIS HIGH-LIFT DEVICE USES A FORWARD-FACING EJECTOR TO INDUCE AIRFLOW INTO A BLUNT, OPENED TRAILING EDGE. THAT FLOW, MIXED WITH THE EJECTOR PRIMARY FLOW, IS DIRECTED DOWNWARD AT APPROXIMATELY MID-CHORD OF THE WING LOWER SURFACE, JUST DOWNSTREAM OF A SHORT RIGID SPLIT FLAP. THE JET FLAP LOCATION AT MID-CHORD IS EXPECTED TO PRODUCE SMALL PITCHING MOMENTS ABOUT THE QUARTER-CHORD. PRELIMINARY TESTS OF A TWO-DIMENSIONAL AIRFOIL IN A SMOKE TUNNEL WERE PERFORMED TO OBTAIN QUALITATIVE AERODYNAMIC PERFORMANCE DATA AND MEASUREMENTS OF EJECTOR OPERATING ENVIRONMENT. TWO-DIMENSIONAL TESTS OF THE JET PUMP, DUCT, AND TURNING VANES WERE CONDUCTED TO ASSIST IN SELECTING A SATISFACTORY EJECTOR CONFIGURATION. RESULTS OF THESE TESTS WERE USED IN THE DESIGN AND CONSTRUCTION OF AN UNTWISTED 10-FT SPAN RECTANGULAR WING OF ASPECT RATIO 8.4 EQUIPPED WITH A COUNTER-FLOW JET FLAP. (AUTHOR) (U)

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM08

AD-684 439 1/3
CORNELL AERONAUTICAL LAB INC BUFFALO N Y FLIGHT RESEARCH DEPT

BACKGROUND INFORMATION AND USER GUIDE FOR MIL-F-83300-MILITARY SPECIFICATION -- FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 71 469P CHALK,CHARLES R. ;KEY, DAVID L. ;KROLL,JOHN , JR.;WASSERMAN,RICHARD ;RADFORD,ROBERT C. ;
CONTRACT: AF 33(615)-3736, F33615-70-C-1322
PROJ: AF-698DC
MONITOR: AFFDL TR-70-88

UNCLASSIFIED REPORT

DESCRIPTORS: (*VERTICAL TAKE-OFF PLANES, PERFORMANCE(ENGINEERING)), (*SHORT TAKE-OFF PLANES, SPECIFICATIONS), MILITARY REQUIREMENTS, STATE-OF-THE-ART REVIEWS, FLIGHT TESTING, HOVERING (U)

THE SPECIFICATION WAS COMPILED AFTER AN EXTENSIVE LITERATURE REVIEW AND MANY MEETINGS AND DISCUSSIONS WITH PERSONNEL FROM ESSENTIALLY ALL CONCERNED CIVILIAN AND GOVERNMENTAL ORGANIZATIONS. THE REPORT ATTEMPTS TO EXPLAIN THE CONCEPT AND PHILOSOPHY UNDERLYING THE V/STOL SPECIFICATION AND TO PRESENT SOME OF THE DATA AND ARGUMENTS UPON WHICH THE REQUIREMENTS WERE BASED. THE DOCUMENT SHOULD ALSO SERVE AS A SUMMARY OF THE STATE OF THE V/STOL FLYING QUALITIES ART AS DETERMINED FROM FLIGHT TEST, SIMULATION, ANALYSIS, AND THEORY. (AUTHOR) (U)

CORPORATE AUTHOR - MONITORING AGENCY

*ADCOLE CORP WALTHAM MASS

• • •

V/STOL APPROACH SYSTEM.
(FAA-RD-66-56)
AD-659 510

*ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT PARIS (FRANCE)

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358
FACTORS LIMITING THE LANDING APPROACH SPEED OF AIRPLANES FROM THE VIEWPOINT OF A PILOT
AD-276 616

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AGARD-303
TUNNEL-WALL EFFECTS ASSOCIATED WITH VTOL-STOL MODEL TESTING.
AD-661 991

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AGARD-317
FLIGHT TEST INSTRUMENTATION FOR V/STOL AIRCRAFT.
AD-652 926

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AGARD-371
METHODES UTILISEES POUR LA MISE AU POINT DE L'AVION BREGUET 940 A AILES SOUFFLEES (METHODS USED FOR THE FINAL DESIGN ANALYSIS OF THE BREGUET 940 'BLOWER-WING' PLANE).
AD-652 998

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AGARD-408A
RECOMMENDATIONS FOR V/STOL HANDLING QUALITIES WITH AN ADDENDUM CONTAINING COMMENTS ON THE RECOMMENDATIONS.
AD-661 748

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AGARD-414
AERODYNAMIC ASPECTS OF BOUNDARY LAYER CONTROL FOR HIGH LIFT AT LOW SPEEDS.
AD-426 377

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AGARD-OGRAPH-46
PARAMETRIC INVESTIGATION OF STOL AIRCRAFT.
AD-687 167

*ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

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AGARD-377
V/STOL HANDLING. I. CRITERIA AND DISCUSSION.
AD-715 593

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AGARD-LS-43-71
ASSESSMENT OF LIFT AUGMENTATION DEVICES.
AD-720 259

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AGARDOGRAPH-126
THE AERODYNAMICS OF V/STOL AIRCRAFT.
AD-688 921

*AEROPHYSICS CO WASHINGTON D C

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REVIEW AND PRELIMINARY EVALUATION OF LIFTING HORIZONTAL-AXIS ROTATING-WING AERONAUTICAL SYSTEMS (HARWAS).
(USAAVLABS-TR-69-13)
AD-697 462

*AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

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ARL-69-0182
THRUST AUGMENTATION CONSIDERATIONS FOR STOL AND EXTENDED CRUISE PROPULSION.
AD-701 728

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ARL-71-0140
WHY EJECTORS FOR AIRCRAFT PROPULSION-LIFT SYSTEMS AND WHERE WE STAND.
AD-732 842

*AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

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AFAPL-TR-66-90
AN ANALYTICAL METHOD OF DETERMINING GENERAL DOWNWASH FLOW FIELD PARAMETERS FOR V/STOL AIRCRAFT.
AD-809 185

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AFAPL-TR-70-80
PERFORMANCE AND ACOUSTIC TESTING OF A VARIABLE CAMBER PROPELLER.
AD-724 145

*AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

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AFFDL-TDR-64-44
STRUCTURAL DYNAMIC RESPONSE OF LARGE LOGISTIC V/STOL VEHICLES.
AD-601 051

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AFFDL-TDR-64-146
PRELIMINARY DESIGN CONSIDERATIONS FOR A V/STOL WIND TUNNEL.
AD-612 906

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AFFDL-TM-72-01-FEM
STATIC AND DROP TESTS OF A QUARTER SCALE MODEL OF THE CC-115 AIRCRAFT EQUIPPED WITH AN AIR CUSHION LANDING SYSTEM.
AD-743 829

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AFFDL-TR-65-73
AN ANALYTICAL STUDY OF V/STOL HANDLING QUALITIES IN HOVER AND TRANSITION.
AD-625 599

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AFFDL-TR-66-114-VOL-1
DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL TACTICAL AIRCRAFT. VOLUME I. ANALYSES.
AD-807 697

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AFFDL-TR-66-114-VOL-2
DISPLAY AND CONTROL REQUIREMENTS STUDY FOR A V/STOL TACTICAL AIRCRAFT. VOLUME II. APPENDIXES.
AD-807 698

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AFFDL-TR-66-118
RESEARCH AND DEVELOPMENT OF A CONTROL-DISPLAY SUBSYSTEM FOR A TACTICAL V/STOL WEAPON SYSTEM.
AD-807 591

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AFFDL-TR-67-119
DEVELOPMENT AND EXPERIMENTAL EVALUATION OF A RETRIEVAL SYSTEM FOR AIR FORCE CONTROL-DISPLAY INFORMATION.
AD-663 756

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AFFDL-TR-68-23
TAKE-OFF AND LANDING CRITICAL ATMOSPHERIC TURBULENCE (TOLCAT) ANALYTICAL INVESTIGATION.
AD-835 272

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AFFDL-TR-70-88
BACKGROUND INFORMATION AND USER GUIDE FOR MIL-F-83300-MILITARY SPECIFICATION -- FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT.
AD-884 439

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THE GENERATION OF A MILITARY SPECIFICATION FOR FLYING QUALITIES OF PILOTED V/STOL AIRCRAFT-MIL-F-83300.
AD-725 746

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AFFDL-TR-71-26-VOL-1
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AD-724 195

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AFFDL-TR-71-26-VOL-2
STOL HIGH-LIFT DESIGN STUDY. VOLUME II. BIBLIOGRAPHY.
AD-724 186

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AFFDL-TR-71-66
A JET FLAP DIFFUSER EJECTOR.
AD-726 596

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AFFDL-TR-71-169
METHOD FOR THE PREDICTION OF PERFORMANCE OF STOL HIGH LIFT SYSTEMS NEAR MAXIMUM LIFT COEFFICIENT.
AD-740 476

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AFFDL-TR-72-44
A STUDY OF THE EFFECTS OF PARAMETER VARIATION ON THE FLYING QUALITIES OF THE XV-4B V/STOL AIRCRAFT.
AD-744 104

*AIR FORCE FLIGHT TEST CENTER EDWARDS AFB CALIF

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AFFTC-SP-67-1001
THE REPORT OF THE AD HOC COMMITTEE ON VSTOL TERMINOLOGY.
AD-658 545

*AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

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AFIT-TR-68-6
A SIMPLE GRAPHICAL METHOD FOR EVALUATING THE EFFECT OF THRUST VECTOR TILT ON THE AIRCRAFT PERFORMANCE.
AD-838 391

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GAM/AE-68-4
A PRELIMINARY ANALYSIS OF THE XV-4B VTOL AIRCRAFT COMPUTER SIMULATION.
AD-838 777

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GAM/AE/68-6
THE AERODYNAMIC CHARACTERISTICS OF NON-AERODYNAMIC SHAPES.
AD-838 823

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GE/EE/72-13
DESIGN OF A LONGITUDINAL FLIGHT CONTROL SYSTEM FOR A STOL TRANSPORT IN THE LANDING CONFIGURATION.
AD-742 319

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GGC/EE/67-7
THE RESPONSE OF A HOVERING V/STOL AIRCRAFT TO DISCRETE TURBULENCE.
AD-825 451

*AIR FORCE OFFICE OF SCIENTIFIC RESEARCH ARLINGTON VA

• • •

AFOSR-TR-71-3086
AERODYNAMICS OF WING-SLIPSTREAM INTERACTION: A NUMERICAL STUDY.
AD-742 257

*AIR VEHICLE CORP LA JOLLA CALIF

• • •

355
LINEARIZED INVISCID-FLOW THEORY OF TWO-DIMENSIONAL THIN JET PENETRATION INTO A STREAM.
(AROD-5274:4-E)
AD-667 427

*AL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)

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NRC-10609
NOISE STUDIES FROM THE FAN-IN-WING MODEL.
AD-684 964

*AMERICAN AIRLINES NEW YORK

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TECHNICAL FEASIBILITY OF FLOATING INTERIM MANHATTAN STOLPORT.
(FAA-RD-70-67)
AD-715 223

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AAL-ER/D-56
AIRLINE VIEW OF STOL SYSTEM REQUIREMENTS.
(DOT-OS-10075)
AD-742 462

*AMERICAN HELICOPTER SOCIETY NEW YORK

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PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM (1ST), 3-4 NOVEMBER 1965, WRIGHTPATTERSON AFB, OHIO.
AD-626 360

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PROCEEDINGS OF NATIONAL V/STOL AIRCRAFT SYMPOSIUM (1ST), SUPPLEMENT, HELD 3-4 NOVEMBER 1965 AT WRIGHT-PATTERSON AFB, OHIO.
AD-634 548

•ARMY AIR MOBILITY RESEARCH AND DEVELOPMENT LAB FORT EUSTIS VA EUSTIS DIRECTORATE

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USAAMRDL-TR-71-62
DYNAMIC RESPONSE OF THE OV-1A AIRCRAFT TO SOFT FIELD LANDINGS.
AD-737 752

•ARMY AIRBORNE ELECTRONICS AND SPECIAL WARFARE BOARD FORT BRAGG N C

• • •

AB5563
INTEGRATED ENGINEERING/SERVICE TEST OF LOW LEVEL EXTRACTION TECHNIQUES (LOLEX) FROM CV-2B AIRCRAFT.
AD-452 582

•ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

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USAAVLABS-TR-65-46
SUGGESTED REQUIREMENTS FOR V/STOL FLYING QUALITIES.
AD-617 748

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USAAVLABS-TR-65-80
INVESTIGATION OF AN ISOLATED MONOCYCLIC V/STOL PROPELLER PERFORMANCE AND OSCILLATORY STRESS.
AD-629 647

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USAAVLABS-TR-65-81
AN INVESTIGATION OF PROPELLER SLIPSTREAM EFFECTS ON V/STOL AIRCRAFT PERFORMANCE AND STABILITY.
AD-629 637

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USAAVLABS-TR-66-39
PRINCIPLES FOR IMPROVING STRUCTURAL CRASHWORTHINESS FOR STOL AND CTOL AIRCRAFT.
AD-637 133

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USAAVLABS-TR-66-73
GENERAL DESCRIPTION OF THE PRINCETON DYNAMIC MODEL TRACK.
AD-645 883

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USAAVLABS-TR-67-21
XV-11A DESCRIPTION AND PRELIMINARY FLIGHT TEST.
AD-654 469

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USAAVLABS-TR-67-55
V/STOL GROUND-BASED SIMULATION TECHNIQUES.
AD-665 425

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USAAVLABS-TR-69-13
REVIEW AND PRELIMINARY EVALUATION OF LIFTING HORIZONTAL-AXIS ROTATING-WING AERONAUTICAL SYSTEMS (HARWAS).
AD-857 462

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USAAVLABS-TR-69-22
SUGGESTED SPECIFICATION FOR A LIFT FAN PROPULSION SYSTEM.
AD-857 455

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USAAVLABS-TR-70-37
XV-11A FLIGHT TEST PROGRAM.
AD-724 124

•ARMY AVIATION MATERIEL LABS FORT EUSTIS VA

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USAAVLABS-TR-66-6
OV-1A MOHAWK FLIGHT LOADS INVESTIGATION PROGRAM.
AD-629 622

•ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

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ECOM-02412-2
THE PRINCETON PENNSYLVANIA ARMY AVIONICS RESEARCH PROGRAM.
AD-844 579

•ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS

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AEWES-TR-3-790
PILOT STUDY OF RESPONSE OF CV-2 AIRCRAFT TO IRREGULAR TERRAIN.
AD-818 980

•ARMY RESEARCH OFFICE DURHAM N C

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AROD-4506:2-E
LIMITS ON MINIMUM-SPEED V/STOL WIND-TUNNEL TESTS.
AD-656 810

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AROD-5274:4-E
LINEARIZED INVISCID-FLOW THEORY OF TWO-DIMENSIONAL THIN JET PENETRATION INTO A STREAM.
AD-667 427

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AROD-T-2:2-E
EXPERIMENTAL AND ANALYTICAL INVESTIGATIONS OF JETS EXHAUSTING INTO A DEFLECTING STREAM.
AD-690 041

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AROD-T-2:17-E
AN EXPERIMENTAL INVESTIGATION OF A TURBULENT JET IN A CROSS FLOW.
AD-718 798

•ARMY TRANSPORTATION RESEARCH COMMAND FORT EUSTIS VA

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CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL II. DYNAMIC LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT, JUNE 26-28, BUFFALO, N.Y.
AD-819 971

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CAL/TRECOM SYMPOSIUM PROCEEDINGS VOL III. DYNAMIC LOAD PROBLEMS ASSOCIATED WITH HELICOPTERS AND V/STOL AIRCRAFT, JUNE 26-28, BUFFALO, N.Y.
AD-819 972

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TRECOM-TR-60-62
U. S. ARMY AC-1 DE HAVILLAND 'CARIBOU' EVALUATION, FT. RUCKER, ALABAMA, 21 JANUARY 1960.
AD-664 155

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TRECOM-TR-61-13-VOL-2
RESULTS OF WIND TUNNEL TESTS OF A FULL SCALE FUSELAGE MOUNTED, TIP TURBINE DRIVEN LIFT FAN. VOLUME 2. ADDITIONAL 30 HOURS OF WIND TUNNEL TESTS. SEPTEMBER-DECEMBER 1960
AD-263 450

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TRECOM-TR-61-41
ACHIEVING CONSISTENCY IN MAXIMUM PERFORMANCE STOL LANDINGS
AD-257 882

• • •

TRECOM-TR-61-93
THE INFLUENCE OF TWO-DIMENSIONAL STREAM SHEAR ON AIRFOIL MAXIMUM LIFT
AD-263 597

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