AD-756 600

HOLOGRAPHY

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MARCH 1973

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Photographic Images						

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HOLOGRAPHY

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F O R E W O R D

This bibliography consists of 139 unclassified and unlimited reports on *Holography*. These references were selected from entries processed into the Defense Documentation Center's data bank during the period of January 1970 through December 1972. This bibliography is an update of AD-704 950, DDC-TAS-70-15-1, dated May 1970.

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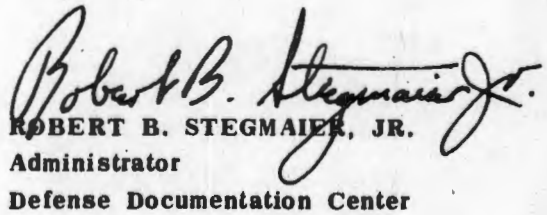

ROBERT B. STEGMAIER, JR.
Administrator
Defense Documentation Center

C O N T E N T S

AD-913 724 17/1 20/1 17/7
BENDIX CORP SOUTHFIELD MICH BENDIX RESEARCH LABS

OPERATION MANUAL: HOLOGRAPHIC UNDERWATER VIEWING SYSTEM. (U)

DESCRIPTIVE NOTE: INTERIM REPT. 27 AUG 68-30 OCT 70,
DEC 70 119P KOPPELMANN,ROGER F. ;
REPT. NO. BRL-5362
CONTRACT: N00014-68-C-0338
PROJ. NR-261-170

UNCLASSIFIED REPORT

DESCRIPTORS: (*ACOUSTIC DETECTORS, *STEREOSCOPIC DISPLAY SYSTEMS), UNDERWATER, INSTRUCTION MANUALS, CATHODE RAY TUBES, VIEWING SCREENS, DESIGN, MANUFACTURING METHODS, TRANSMITTER-RECEIVERS, LOGIC CIRCUITS, DIGITAL-TO-ANALOG CONVERTERS, UNDERWATER NAVIGATION, WIRING DIAGRAMS, IMAGES, SOUND SIGNALS, ACOUSTICS (U)

IDENTIFIERS: *ACOUSTIC HOLOGRAPHY, HOLOGRAPHY, ACOUSTIC IMAGES, UNDERWATER VIEWING SYSTEMS (U)

THIS REPORT DESCRIBES THE ELECTRONICS PORTION OF AN HOLOGRAPHIC UNDERWATER VIEWING SYSTEM. THE CONTENTS INCLUDE A GENERAL SYSTEM DESCRIPTION, A DETAILED DESCRIPTION OF THE INDIVIDUAL SUBSYSTEMS, AND SCHEMATICS FOR THE ENTIRE ELECTRONIC SYSTEM. (U)

AD-513 812 17/1 20/6 20/1 9/1
BENDIX CORP SOUTHFIELD MICH BENDIX RESEARCH LABS

INTERIM TECHNICAL REPORT. (U)

DESCRIPTIVE NOTE: REPT. FOR JAN-DEC 70,
JAN 71 31P STEINBERG,RONALD F. ;
REPT. NO. BRL-3406
CONTRACT: N00014-68-C-0338
PROJ. NR-261-170

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC DISPLAY SYSTEMS, SONAR SOUND ANALYZERS), (*SOUND SIGNALS, IMAGES), (*IMAGE TUBES, RESOLUTION), (*ELECTRON TUBE TARGETS, SINGLE CRYSTALS), ELECTROOPTICS, PIEZOELECTRIC CRYSTALS, HYDROPHONES, ULTRASONIC RADIATION, UNDERWATER SOUND GENERATORS, PHASE MODULATION, LIGHT TRANSMISSION, STABILITY, MICROSCOPES, DEGRADATION, COLOR CENTERS, SONAR SIGNALS, INFORMATION THEORY, OPTICAL COATINGS, BARRIER COATINGS, SONAR ARRAYS, PHOTOCHROMISM, STEREOSCOPIC PHOTOGRAPHY, COHERENT RADIATION, INTERFERENCE (U)

IDENTIFIERS: *ACOUSTIC IMAGES, *LIGHT MODULATION, CATHODOCHROMIC DISPLAY SYSTEMS, PHOTOCHROMIC DISPLAY SYSTEMS, OPTICAL APERTURES, HOLOGRAPHY, SYNTHETIC APERTURE SONAR, IMAGE PROCESSING, SIGNAL PROCESSING, ACOUSTIC APERTURES, CURIE TEMPERATURE (U)

CONTENTS: UNDERWATER VIEWING SYSTEM -- ACOUSTIC PROJECTOR, RECEIVING ARRAY, PROCESSING ELECTRONICS AND SYSTEM OPERATION; HOLOGRAM RECONSTRUCTIONS -- SYNTHETIC APERTURE ANALYSIS, COHERENT LIGHT AREA MODULATOR. (U)

AD-702 420 14/2 14/5 21/5
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS

INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 29 JAN 69-29 JAN 70, FEB 70 111P WATERS,J. P. ;AAS,H. G. ;ERF,R. K. ;
REPT. NO. UACRL-J990798-13
CONTRACT: N00019-69-C-0271

UNCLASSIFIED REPORT

DESCRIPTORS: (*TURBINE BLADES, NON-DESTRUCTIVE TESTING), (*STEREOSCOPIC PHOTOGRAPHY, *INTERFEROMETERS), LASERS, STRESSES, STRAIN(MECHANICS), OPTICAL ANALYSIS (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAMS, *INTERFEROMETRIC HOLOGRAPHY (U)

THE PRIMARY RESULTS OF A RESEARCH INVESTIGATION TO DETERMINE THE FEASIBILITY OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS ARE REPORTED AND MAY BE BRIEFLY SUMMARIZED AS FOLLOWS: (1) IT HAS BEEN DEMONSTRATED THAT THE STRAIN AT THE SURFACE OF A TURBINE BLADE, EXCITED IN DYNAMIC FLEXURE, CAN BE CALCULATED FROM INTERFEROMETRIC HOLOGRAPHIC FRINGE INFORMATION. (2) INTERFEROMETRIC HOLOGRAPHY APPEARS TO OFFER SOME PROMISE IN THE DETECTION OF WEAKNESSES, UNUSUAL WEAR OR FATIGUE IN TURBINE BLADES, HOWEVER EXPERIMENTAL IMPLEMENTATION AND FRINGE INTERPRETATION WOULD BE A SOMEWHAT TIME CONSUMING PROCESS. (3) THE INTRODUCTION OF ELEVATED TEMPERATURES TO THE TURBINE BLADE STRESS ANALYSIS PROBLEM REQUIRES THE USE OF PULSED HOLOGRAPHIC TECHNIQUES FOR BEST RESULTS, BUT OTHERWISE IT APPEARS TO PRESENT NO INSURMOUNTABLE PROBLEMS. (4) PULSED INTERFEROMETRIC HOLOGRAMS OF TRANSIENT AND CYCLICALLY EXCITED TURBINE BLADES HAVE BEEN SUCCESSFULLY AND READILY CONSTRUCTED, DEMONSTRATING THAT THE DEVELOPED PULSED LASER SYSTEM POSSESSES MORE THAN SUFFICIENT PULSE REPRODUCIBILITY, COHERENCE AND INTENSITY FOR RECORDING REFLECTED LIGHT HOLOGRAMS. (AUTHOR) (U)

AD-702 499 8/1 6/6 14/5

TRW SYSTEMS REDONDO BEACH CALIF PHYSICAL RESEARCH CENTER

ECOLOGICAL STUDIES OF MARINE PLANKTON. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 70 36P SRINIVASAN,VAKULA S. ;SILVERMAN, HERBERT P. ;

REPT. NO. 07966-6002-R000

CONTRACT: N00014-67-C-0316

UNCLASSIFIED REPORT

DESCRIPTORS: (*ECOLOGY, PLANKTON), (*PLANKTON, STEREOSCOPIC PHOTOGRAPHY), MARINE BIOLOGY, RECORDING SYSTEMS, LASERS, ILLUMINATION, OPTICAL EQUIPMENT (U)

IDENTIFIERS: *HOLOGRAPHY (U)

HOLOGRAPHIC TECHNIQUES FOR THE ECOLOGICAL STUDY OF MARINE PLANKTON WERE EXAMINED. HOLOCAMERA DESIGN, LASER ILLUMINATION SOURCES AND RECORDING EMULSION REQUIREMENTS WERE INVESTIGATED. EXPLORATORY WORK ON PHOTOTACTIC RESPONSES OF MARINE ORGANISMS AND HOLOGRAPHIC MOVIES FOR THE LOCOMOTION OF COPEPODS WERE PERFORMED. IMAGE REDUCTION TECHNIQUES FOR THE STUDY OF LARGE VOLUMES WERE INVESTIGATED. A TECHNIQUE FOR RECORDING LARGE VOLUME SCENES WAS SUCCESSFULLY DEMONSTRATED. (AUTHOR) (U)

AD-702 539 20/6
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY

INVESTIGATIONS BY ANALYTIC AND THEORETICAL PROCEDURE OF VISIBILITY FUNCTIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 DEC 65-31 DEC 69, JAN 70 28P WOLF,EMIL ;
CONTRACT: AF 19(628)-4771
PROJ. AF-8603, AF-5634
TASK: 860303, 563407
MONITOR: AFCRL 70-0104

UNCLASSIFIED REPORT

DESCRIPTORS: (*COHERENT RADIATION, REVIEWS), PHOTONS, PHOTOELECTRIC EFFECT, SCATTERING, VISIBILITY (U)

IDENTIFIERS: HOLOGRAPHY, VISIBILITY FUNCTIONS (U)

THE WORK WAS CHIEFLY CONCERNED WITH PROCEDURES OF RECOVERING SPECTRAL AND OTHER INFORMATION FROM VISIBILITY FUNCTIONS AND WITH A NUMBER OF CLOSELY RELATED QUESTIONS OF OPTICAL COHERENCE THEORY. (AUTHOR) (U)

AD-703 299 20/6 14/5 20/5
TENNESSEE UNIV SPACE INST TULLAHOMA

OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA. (U)

DESCRIPTIVE NOTE: FINAL REPT. SEP 68-SEP 69,
FEB 70 80P SHOFNER,FREDERICK M. ;WEBB,
RONALD O. ;MENZEL,REINHARD W. ;HEIFNER,ROY L. ;
CONTRACT: F33615-69-C-1007
PROJ. AF-8219
TASK: 821907
MONITOR: AFFDL TR-69-100

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLUID FLOW, VELOCITY), (*PHOTOGRAPHIC TECHNIQUES, FLUID FLOW), (*STEREOSCOPIC PHOTOGRAPHY, LASERS), INTENSITY, ACCURACY, OPTICAL FILTERS, BESSEL FUNCTIONS, DATA PROCESSING SYSTEMS (U)

IDENTIFIERS: *HOLOGRAPHY, OPTICAL DATA PROCESSING (U)

THE APPLICATION OF HOLOGRAPHIC VELOCIMETRY (HV) TO TWO SIMPLE WATER FLOW PROBLEMS HAS EMPHASIZED THE NEED TO INVESTIGATE FURTHER THE DELTA Z ACCURACY PROBLEM. ATTEMPTS TO IMPROVE UPON THE PLUS OR MINUS 1 MM DELTA Z ACCURACY USING SPHERICAL WAVE RECORDING AND DIRECT PROCESSING LED TO THE THEORETICAL DEVELOPMENT OF THE SPHERICAL INTENSITY EQUATION AND THE ACCURACY ENHANCEMENT PROVIDED BY USING SPHERICAL WAVES IN THE RECORDING PHASE. IT APPEARS CONCLUSIVE THAT THE MILLIMETER BARRIER WILL BE DIFFICULT TO BREAK USING DIRECT PROCESSING. ASSUMING THE IN-LINE FRAUNHOFER HOLOGRAM IS NO BETTER IN FOCUSING THAN A THIN LENS, IT IS SHOWN THAT THE SAME LIMITATION IN ACCURACY EXISTS FOR HOLOGRAPHIC RECONSTRUCTION PROCESSING SCHEMES APPROPRIATE TO HV. OPTICAL DATA PROCESSING TECHNIQUES, ALTHOUGH NOT RESEARCHED TO THE DEGREE OF DIRECT AND RECONSTRUCTION SCHEMES, APPEAR TO OFFER PROMISE FOR BETTER DELTA Z RESOLUTION. TWO IMPORTANT EXPLORATORY EXPERIMENTS ON THE SELECTIVITY CHARACTERISTICS OF OPTICAL MATCHED FILTERS ARE REPORTED. (AUTHOR) (U)

AD-703 984 14/5 7/5
HUGHES RESEARCH LABS MALIBU CALIF CHEMICAL PHYSICS DEPT

RAPID ACCESS PHOTOPOLYMERIZATION IMAGING, (U)

APR 70 21P BRAULT,R. G. ;JENNEY ,J. A. ;
MARGERUM,J. D. ;MILLER,L. J. ;RUST,J. B. ;
CONTRACT: F44620-68-C-0043
PROJ. AF-9540
MONITOR: AFOSR 70-0991TR

UNCLASSIFIED REPORT

DESCRIPTORS: (•PHOTOGRAPHIC IMAGES, •POLYMERIZATION), (•DYES, POLYMERIZATION), (•METHYLENE BLUE, PHOTOGRAPHIC IMAGES), PHOTOCHEMISTRY, ACRYLIC RESINS, STEREOSCOPIC PHOTOGRAPHY, LASERS, OXIDATION-REDUCTION REACTIONS, SCATTERING, FREE RADICALS, CATALYSTS (U)

IDENTIFIERS: •PHOTOPOLYMERIZATION IMAGING, •HOLOGRAMS, SULFINATES, TOLUENE SULFINATES (U)

RAPID ACCESS PHOTOPOLYMERIZATION TECHNIQUES AND APPLICATIONS ARE DESCRIBED. DYE SENSITIZED POLYMERIZATION OF AQUEOUS ACRYLIC SOLUTIONS CAN BE USED FOR THE DIRECT FORMATION OF EITHER LIGHT SCATTERING OR SURFACE PERTURBATION IMAGES, DEPENDING UPON THE FORMULATION AND PROCESSING. THE RAPID FIXING METHODS ARE BASED ON PHOTOCHEMICAL, THERMAL, OR DRYING PROCESSING. APPLICATIONS OF TRANSPARENT PERTURBATION-TYPE PHOTOPOLYMERS ARE DESCRIBED IN THE REAL-TIME RECORDING OF HOLOGRAMS AND IN A RAPID-ACCESS LARGE SCREEN DISPLAY SYSTEM. (AUTHOR) (U)

AD-704 199 20/1
TEMPLE UNIV PHILADELPHIA PA DEPT OF PHYSICS

EXPERIMENTAL VERIFICATION AND VISUALIZATION OF CREEPING WAVES FOR ACOUSTIC SCATTERING BY RIGID BODIES IN AIR. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
FEB 70 46P STEINBERG,BRUCE N. ;HARBOLD,MARY L. ;
CONTRACT: NONR-3806(02)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ERRATA SHEET INSERTED.

DESCRIPTORS: (*SOUND, SCATTERING), DIFFRACTION, CYLINDRICAL BODIES, INTERFEROMETERS, LASERS, STEREOSCOPIC PHOTOGRAPHY (U)

IDENTIFIERS: CREEPING WAVES, HOLOGRAPHY, *ACOUSTIC HOLOGRAPHY (U)

APPLICATION OF THE MATHEMATICAL TECHNIQUE KNOWN AS THE SOMMERFELD-WATSON TRANSFORMATION TO THE NORMAL-MODE SOLUTION OF SCATTERING PROBLEMS LED TO THE PHYSICAL INTERPRETATION OF 'CREEPING WAVES' BY FRANZ WHO CALCULATED THEIR PHASE VELOCITY AND ATTENUATION. THE FIRST DIRECT EXPERIMENTAL VERIFICATION OF THESE CONCLUSIONS WAS PERFORMED IN THIS LABORATORY, FOR ACOUSTIC WAVES IN AIR BY USING ACOUSTIC TRANSDUCERS IMBEDDED IN THE SURFACE OF RIGID BODIES. LATER EXPERIMENTS EXTENDED THE TECHNIQUES BY USING COINCIDENCE METHODS WITH OPTICAL DETECTORS FOR LASER BEAMS REFLECTED FROM THE SURFACE. HOLOGRAPHIC STUDIES WERE ALSO ATTEMPTED FOR THE REGION JUST OUTSIDE THE SCATTERER BY USE OF TWO-BEAM INTERFEROMETRY OF THE MACH-ZEHNDER TYPE. (AUTHOR) (U)

AD-705 228 14/2 14/5
MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES. (U)

DESCRIPTIVE NOTE: SEMIANNUAL REPT. NO. 2, 1 JUN-30 NOV 69,
APR 70 78P LEITH,EMMETT N. ;VEST,CHARLES M. ;
REPT. NO. 2420-9-P
CONTRACT: DAAG46-69-C-0017, ARPA ORDER-1245

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO SEMIANNUAL REPT. DATED AUG 69, AD-857 061.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), (*NON-DESTRUCTIVE TESTING, LASERS), STRESS CORROSION, CRACKS, INTERFEROMETERS, SANDWICH CONSTRUCTION, HONEYCOMB CORES, STEEL, VIBRATION (U)

IDENTIFIERS: *HOLOGRAPHY (U)

THE REPORT INCLUDES STUDIES OF INTERFEROMETRIC DETECTION OF STRESS CORROSION CRACKING, TESTING OF HONEYCOMB SANDWICH STRUCTURES, TECHNIQUES DEVELOPED FOR PULSED-LASER CONTOURING AND INTERFEROMETRY, LASER SPECKLE REDUCTION IN INTERFEROMETRY, MODULATED REFERENCE-WAVE HOLOGRAPHY, AND FLAW DETECTION. HOLOGRAPHIC INTERFEROMETRY HAS BEEN USED TO DETECT INITIATION OF STRESS CORROSION, MONITOR THE PROGRESSING OF DELAYED CRACKING, AND DETECT BOND DEFECTS IN AN AIRCRAFT TRIM TAB OF HONEYCOMB STRUCTURE. THE SEVERAL THEORETICAL AND EXPERIMENTAL INVESTIGATIONS CONDUCTED INCLUDE THE DEVELOPMENT OF MULTIPLE-WAVELENGTH HOLOGRAPHIC INTERFEROMETRY, THE STUDY OF TECHNIQUES FOR IMPROVING INTERFEROMETRY OF THREE-DIMENSIONAL TRANSPARENT OBJECTS, THE APPLICATION OF MODULATED REFERENCE-WAVE HOLOGRAPHY TO VIBRATING DIFFUSELY REFLECTING OBJECTS, AND THE APPLICATION OF HOLOGRAM INTERFEROMETRY TO DETECTION OF FLAWS IN CYLINDRICAL STEEL OBJECTS. (AUTHOR) (U)

AD-705 351 20/11
SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE)
WASHINGTON D C

THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 5, MAY 1970. (U)

MAY 70 38P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, NUMBER 4, AD-704 305.
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DESCRIPTORS: (*SHOCK(MECHANICS), REVIEWS), (*VIBRATION, NAVAL RESEARCH), ABSTRACTS, NOISE, TEST EQUIPMENT, FATIGUE(MECHANICS), STRUCTURES, EXPLOSIONS, PROGRAMMING(COMPUTERS), EQUATIONS OF MOTION, MODEL TESTS, MATHEMATICAL ANALYSIS, DAMPING, SHOCK WAVES, SPACECRAFT, IMPELLERS (U)

IDENTIFIERS: HOLOGRAPHY (U)

CONTENTS: FEATURE ARTICLE--OPTIMIZATION OF EQUIPMENT RELIABILITY AND COST FOR SHOCK AND VIBRATION ENVIRONMENTS; PREVIEWS OF MEETINGS; NEWS BRIEFS; ABSTRACTS FROM THE CURRENT LITERATURE (ANALYSIS AND DESIGN METHODS, EXCITATION, PHENOMENOLOGY, EXPERIMENTATION, COMPONENTS, SYSTEMS); BOOK REVIEWS; AND SHORT COURSES. (U)

AD-706 403 14/5 20/6
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

RESOLUTION LIMITS OF FRAUNHOFER HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN-SEP 69,
MAY 70 71P BELZ,RONALD A. ;
REPT. NO. AEDC-TR-70-23
CONTRACT: F40600-69-C-0001
PROJ. AF-4344, ARO-BC5016
TASK: 434432

UNCLASSIFIED REPORT

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

DESCRIPTORS: (*PARTICLES, MEASUREMENT), (*OPTICAL ANALYSIS, RESOLUTION), DIFFRACTION, LASERS, STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC FILM (U)

IDENTIFIERS: *FRAUNHOFER HOLOGRAPHY, *HOLOGRAPHY, FAR FIELD (U)

THE RESOLUTION OF AN IN-LINE HOLOGRAM RECORDED WITH PLANE WAVES IN THE FRAUNHOFER REGION OF A CIRCULAR, OPAQUE, PARTICLE IS EVALUATED. FROM THE DIFFRACTION INTEGRAL FOR THE RECONSTRUCTED, REAL IMAGE THE INTENSITY DISTRIBUTION ABOUT THE IMAGE IS FOUND. CRITERIA FOR DETERMINING THE EDGE OF THE IMAGE IN ADDITION TO DETERMINING THE PLANE OF FOCUS ARE SPECIFIED FROM THE DATA, AND THE MEASUREMENT ACCURACIES ARE FOUND. THE INACCURACIES ARE SHOWN TO BE A RESULT OF THE INABILITY OF THE FILM TO RECORD ALL OF THE LIGHT DIFFRACTED BY THE PARTICLE. THE REASONS FOR THIS, FILM GRAIN NOISE AND ITS CUTOFF FREQUENCY AND DYNAMIC RANGE, ARE EXPLAINED AND THEIR RELATIVE EFFECTS COMPARED FOR THE VARIOUS PARTICLE SIZES AND RECORDING DISTANCES. (AUTHOR) (U)

AD-707 845 20/14 12/1
ILLINOIS UNIV URBANA ANTENNA LAB

INVESTIGATION OF A CLASS OF ELECTROMAGNETIC BOUNDARY VALUE PROBLEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 FEB 69-31 JAN 70, FEB 70 18P MITTRA,RAJ ;
REPT. NO. UIAL-70-4, UILU-ENG-70-204
CONTRACT: F19628-69-C-0015
PROJ. AF-5635
TASK: 563502
MONITOR: AFCRL 70-0266

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTROMAGNETIC WAVES, WAVE TRANSMISSION), (*BOUNDARY VALUE PROBLEMS, INTEGRATION), NUMERICAL ANALYSIS, PHASED ARRAYS, WAVEGUIDES, DIFFRACTION (U)

IDENTIFIERS: IMAGE PROCESSING, HOLOGRAPHY, RESIDUE CALCULUS, FAR FIELD (U)

THE PURPOSE OF THIS PROJECT WAS TO APPLY A CLASS OF NEWLY DEVELOPED TECHNIQUES TO THE SOLUTION OF PROBLEMS INVOLVING WAVEGUIDE DISCONTINUITIES, SCATTERING, AND DIFFRACTION AS WELL AS INVERSE SCATTERING PROBLEMS. ANOTHER OBJECTIVE OF THE PROJECT WAS TO STUDY IMAGE PROCESSING AND INVERSE SCATTERING TECHNIQUES INVOLVING COHERENT FIELDS. A RATHER LARGE NUMBER OF WAVEGUIDE AS WELL AS OPEN-REGION BOUNDARY VALUE PROBLEMS HAS BEEN INVESTIGATED USING THE MODIFIED RESIDUE CALCULUS TECHNIQUE AND EXTENDED VERSIONS OF THE SAME. THE RELATIVE ADVANTAGES OF THESE METHODS OVER CONVENTIONAL NUMERICAL METHODS HAVE BEEN DEMONSTRATED. INVESTIGATION OF THE INVERSE SCATTERING PROBLEM BETWEEN PARALLEL PLANES HAS BEEN COMPLETED. THE INVERSE SCATTERING APPROACH HAS BEEN EXTENDED TO SOLVE THE PROBLEM OF SCATTERING FROM CYLINDERS OF ARBITRARY CROSS SECTION. (AUTHOR) (U)

AD-708 588 20/6 20/5
STANFORD UNIV CALIF STANFORD ELECTRONICS LABS

ANALOGY BETWEEN HOLOGRAPHY AND INTERFEROMETRIC IMAGE FORMATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 70 6P GOODMAN,J. W. ;
REPT. NO. SU-SEL-70-041, TR-6415-1
CONTRACT: NOOO14-67-A-0112-0023

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF THE OPTICAL SOCIETY OF AMERICA, V60 N4 P506-509 APR 70.

DESCRIPTORS: (*INTERFEROMETERS, OPTICAL IMAGES), (*OPTICAL IMAGES, CORRELATION TECHNIQUES), LASERS, SIMULATION, COHERENT RADIATION, OPTICAL ANALYSIS (U)

IDENTIFIERS: INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY (U)

AN ANALOGY IS DRAWN BETWEEN HOLOGRAPHIC IMAGING WITH COHERENT LIGHT AND INTERFEROMETRIC IMAGING WITH INCOHERENT LIGHT, BY MEANS OF A SPATIALLY OFFSET INCOHERENT REFERENCE SOURCE, THE AMPLITUDE AND PHASE OF THE COMPLEX COHERENCE FACTOR OF AN INCOHERENT OBJECT MAY BE ENCODED AS AMPLITUDE AND PHASE MODULATIONS OF A FUNCTION DERIVED FROM CLASSICAL VISIBILITY MEASUREMENTS. THIS IMAGING TECHNIQUE SHARES SEVERAL PROPERTIES WITH HOLOGRAPHY, INCLUDING THE ABILITY TO IMAGE THROUGH A DISTORTING MEDIUM AND THE ABILITY TO FORM THREE-DIMENSIONAL IMAGES. (AUTHOR) (U)

AD-708 641 7/4
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS, (U)

26 JAN 70 7P BECSEY,JULIUS G. ;JACKSON, NATHANIEL R. ;BIERLEIN,JAMES A. ;MADDUX,GENE E. ;
REPT. NO. ARL-70-0086
PROJ. AF-7023
TASK: 702300

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V74 N6 P1401-1403, 19 MAR 70.

DESCRIPTORS: (*LIQUIDS, *DIFFUSION), THERMAL DIFFUSION, INTERFEROMETERS, SOLUTIONS (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY (U)

THE PAPER REPORTS THE APPLICATION OF A HOLOGRAPHIC INTERFEROMETER TO IN SITU STUDIES OF THERMAL DIFFUSION IN BINARY LIQUID SYSTEMS. (U)

AD-708 911 20/6 14/5
RAND CORP SANTA MONICA CALIF

HOLOGRAPHY IN A SPATIALLY INHOMOGENEOUS MEDIUM, (U)

JUN 70 21P YURA,H. T. I
REPT. NO. P-4394

UNCLASSIFIED REPORT

DESCRIPTORS: (*RESOLUTION, MATHEMATICAL ANALYSIS), (*UNDERWATER PHOTOGRAPHY, RESOLUTION), (*LASERS, UNDERWATER PHOTOGRAPHY), SCATTERING, SEA WATER (U)

IDENTIFIERS: *HOLOGRAPHY (U)

A HUYGENS-FRESNEL PRINCIPLE, EXTENDED TO A MEDIUM WHICH EXHIBITS A SPATIAL VARIATION IN THE INDEX OF REFRACTION, IS USED TO CALCULATE THE RESULTING FRINGE PATTERNS IN THE FRESNEL-FRAUNHOFER AND POINT REFERENCE FOURIER-TRANSFORM METHODS OF HOLOGRAPHY. IN PARTICULAR, THE RESOLUTION LIMITS PERTAINING TO THESE TWO METHODS ARE DERIVED. NUMERICAL RESULTS PERTAINING TO UNDERWATER HOLOGRAPHY ARE GIVEN. (AUTHOR) (U)

AD-709 603 14/2 19/6 11/4
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIRECTORATE

APPLICATIONS OF HOLOGRAPHY TO COMPONENT TESTING. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 70 36P IVERSEN,R. J. ;MCGARVEY,J. W. ; SCHULZ,R. D. ;
REPT. NO. AMSWE-RE-70-157
PROJ. DA-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (•NON-DESTRUCTIVE TESTING, •LAMINATES), (•GUN BARRELS, NON-DESTRUCTIVE TESTING), (•LASERS, NON-DESTRUCTIVE TESTING), INTERFEROMETERS, LAMINATED PLASTICS, METALS, COMPOSITE MATERIALS, STRESSES (U)

IDENTIFIERS: •HOLOGRAPHY, •INTERFEROMETRIC HOLOGRAPHY (U)

TWO NEW APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY ARE PRESENTED. THE FIRST DEALS WITH THE DETECTION OF BONDING VOIDS IN RUBBER-TO-MTAL, PLASTIC-TO-METAL, AND METAL-TO-METAL LAMINATES. THE SECOND APPLICATION INVOLVES A NEW TECHNIQUE FOR THE DETERMINATION OF THE DIMENSIONAL ACCURACY OF CYLINDERS, SUCH AS GUN BARREL BORES. THE METHODS USED TO DETECT LAMINATE VOIDS, INCLUDING ACOUSTICAL STRESSING AND THERMAL STRESSING, ARE DISCUSSED, AND RESULTS PRESENTED. THE FACTORS INFLUENCING THE APPLICABILITY OF HOLOGRAPHY FOR BARREL BORE INSPECTION ARE DISCUSSED, AND COMPUTER PROGRAMS USED IN THE SYSTEM DESIGN ARE INCLUDED. (AUTHOR) (U)

AD-709 764 20/4 1/1 14/5

ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

AERODYNAMIC HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUL 67-JUL 69,
AUG 70 100P TROLINGER,J. D. ;O'HARE,J. E. ;
REPT. NO. AEDC-TR-70-44
CONTRACT: F40600-71-C-0002
PROJ. AF-4344, ARO-BC5016

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO, INC., TULLAHOMA, TENN. REPT. NO. ARO-OMD-TR-70-44.

DESCRIPTORS: (*AERODYNAMICS, *LASERS), STEREOSCOPIC PHOTOGRAPHY, FLOW VISUALIZATION, INTERFEROMETERS (U)

IDENTIFIERS: *HOLOGRAPHY (U)

A SUMMARY OF THE WORK IN HOLOGRAPHY AT AEDC IS PRESENTED. THE WORK INCLUDES BASIC AND APPLIED RESEARCH WITH EMPHASIS ON THE APPLICATIONS OF HOLOGRAPHY TO AERODYNAMIC TESTING. (AUTHOR) (U)

AD-710 144 20/5
TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA. (U)

27 MAY 70 12P FRIEDRICH,OTTO M. ; JR.;WEIGL, FREDERIC ;DOUGAL,ARWIN A. ;

CONTRACT: AF-AFOSR-1792-69
MONITOR: AFOSR 70-2146TR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE NATIONAL SYMPOSIUM (16TH), ANALYSIS INSTRUMENTATION DIV., INSTRUMENT SOCIETY OF AMERICA, 25-27 MAY 70, PITTSBURGH, PA.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), (*LIGHT TRANSMISSION, ATTENUATION), TRANSPARENT PANELS, PHASE DISTORTION, SCATTERING, RESOLUTION, LIGHT PULSES, OPTICAL IMAGES, RAYLEIGH WAVES, IONIZATION, PLASMA MEDIUM, PHOTOGRAPHIC TECHNIQUES, MASERS (U)

IDENTIFIERS: HOLOGRAMS, THOMSON EFFECT, RUBY LASERS (U)

A THEORY IS DEVELOPED AND PRESENTED FOR MULTI-PASS ATTENUATION MEASUREMENTS USING HOLOGRAPHIC RECORDING/RECONSTRUCTION TECHNIQUES. THE INTENSITIES OF THE FIRST-ORDER RECONSTRUCTED BEAMS ARE SHOWN TO VARY DIRECTLY WITH THE INTENSITY OF THE DESIRED MULTI-PASS TEST BEAM COMPONENT UNDER PROPER CONDITIONS. AN IMPROVED HOLOGRAPHIC RECONSTRUCTION OF AN ATTENUATING TRANSPARENT MEDIUM IS PROPOSED WHICH INCORPORATES THE USE OF A LOW RESOLUTION POSITIVE PRINT OF THE NEGATIVE HOLOGRAM TO ACHIEVE DESIRABLE FILM FOG CANCELLATION. A THEORY HAS BEEN FORMULATED FOR THIS IMPROVED, PROPOSED HOLOGRAPHIC RECONSTRUCTION TECHNIQUE WHERE ENHANCED IMAGE RESULTS ARE PREDICTED. (AUTHOR) (U)

AD-710 365 14/5 20/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

HOLOGRAPHIC DETERMINATION OF TRANSLATION AND ROTATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 70 37P FLOYD,RICHARD PAUL ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *LASERS), (*INTERFEROMETERS, MEASUREMENT), ROTATION, OPTICAL ANALYSIS, NUMERICAL METHODS AND PROCEDURES, PHOTOGRAPHIC TECHNIQUES, THESES (U)

IDENTIFIERS: *HOLOGRAPHY (U)

ANALYTIC INVESTIGATION WAS MADE OF THE LIGHT REFLECTED BY TRANSLATED AND ROTATED OBJECTS, AND EXPRESSIONS WERE OBTAINED FOR THE INTERFERENCE PATTERNS PRODUCED BY THIS LIGHT. THE TECHNIQUE OF HOLOGRAPHY WAS USED TO EXPERIMENTALLY MEASURE FRINGE PATTERNS PRODUCED BY THIS INTERFERENCE, AND TO EXPERIMENTALLY DETERMINE TRANSLATION AND ROTATION. (AUTHOR) (U)

AD-711 085 20/1 14/2
PERKIN-ELMER CORP NORWALK CONN OPTICAL GROUP

INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING. (U)

DESCRIPTIVE NOTE: SEMI-ANNUAL TECHNICAL REPT. 1 MAY-31 OCT 69,
APR 70 68P ARNDT,WALTER R. ;KREUZER,JUSTIN L. ;
REPT. NO. PE-ER-9725
CONTRACT: DAAG46-69-C-0010, ARPA ORDER-1245
MONITOR: AMMRC CR-70-14

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *ULTRASONIC RADIATION), STEREOSCOPIC PHOTOGRAPHY, MICROSCOPES, CAMERAS, DESIGN, WIRING DIAGRAMS, OPTICAL IMAGES (U)

IDENTIFIERS: *ACOUSTIC IMAGES, ULTRASONIC IMAGING, *ULTRASONIC HOLOGRAPHY, *HOLOGRAPHY, *ACOUSTIC HOLOGRAPHY (U)

THE PURPOSE OF THIS RESEARCH PROGRAM WAS TO ANALYZE AND PERFORM EXPERIMENTAL DEMONSTRATIONS OF THE APPLICATION OF ULTRASONIC HOLOGRAPHIC AND ULTRASONIC LIGHT DIFFRACTION TECHNIQUES TO THE DETECTION, ANALYSIS, AND EXAMINATION OF THE INTERNAL STRUCTURE OF OPTICALLY OPAQUE MATERIALS. DURING THE PERIOD COVERED BY THIS REPORT, THE ELECTRONIC CIRCUITS FOR THE ULTRASONIC CAMERA WERE REDESIGNED AND THE NEW HARDWARE FABRICATED AND TESTED. THE REVISED SYSTEM, DESCRIBED IN DETAIL IN THIS REPORT, HAS THE INHERENT FLEXIBILITY IMPROVED STABILITY, AND ENHANCED PERFORMANCE TO PERMIT THE ACCURATE GENERATION OF ULTRASONIC HOLOGRAMS. AN ELEMENTARY THEORY OF THE ULTRASONIC DIFFRACTION MICROSCOPE IS OUTLINED IN THE REPORT AND SOME PRELIMINARY SUPPORTING EXPERIMENTAL ARE DESCRIBED. (AUTHOR) (U)

AD-711 551 20/11
SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE)
WASHINGTON D C

THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 9, SEPTEMBER 1970. (U)

SEP 70 48P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, NO. 8, AD-709 734.
AVAILABILITY: PAPER COPY AVAILABLE FROM NAVY PUBLICATIONS AND PRINTING SERVICE OFFICE, BLDG. 157-2, WASHINGTON, D. C. 20390. ANNUAL SUBSCRIPTION $10.00. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*SHOCK(MECHANICS), REVIEWS), (*VIBRATION, NAVAL RESEARCH), REPORTS, ABSTRACTS, STRUCTURAL PROPERTIES, MODELS(SIMULATIONS), FLUID MECHANICS, ACOUSTICS, AERODYNAMIC CONFIGURATIONS, MECHANICAL PROPERTIES, VIBRATION ISOLATORS (U)

IDENTIFIERS: MOIRE EFFECTS, HOLOGRAPHY, PHOTOELASTICITY (U)

CONTENTS: NEWS BRIEFS; PREVIEWS OF MEETINGS; SHORT COURSES; ADVANCE PROGRAM OF THE 41ST SHOCK AND VIBRATION SYMPOSIUM; ABSTRACTS FROM THE CURRENT LITERATURE; ANALYSIS AND DESIGN METHODS; EXCITATION; PHENOMENOLOGY; EXPERIMENTATION; COMPONENTS; SYSTEMS; BOOK REVIEWS; AND CALENDAR. (U)

AD-712 324 9/1
ITT ELECTRON TUBE DIV FORT WAYNE IND

PATTERN THRESHOLD RECOGNITION DEVICE. (U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 3, 1 JAN-31 MAR 70,
AUG 70 78P HUNTER,ROGER W. ;WOLFGANG,L. G.
;
CONTRACT: DAAB07-69-C-0471
PROJ. DA-1-H-662705-A-055
TASK: 1-H-662705-A-05503
MONITOR: ECOM 0471-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO QUARTERLY REPT. NO. 2, AD-705 394.

DESCRIPTORS: (*CAMERA TUBES, PATTERN RECOGNITION), IMAGE CONVERTERS, LASERS, STORAGE TUBES, ELECTRON GUNS, ELECTRON TUBE TARGETS, PHOTOCATHODES, MAGNESIUM OXIDES (U)

IDENTIFIERS: HOLOGRAMS (U)

THE OBJECTIVE OF THE CONTRACT IS TO DEVELOP A CAMERA-TUBE UTILIZING AN ELECTRO-STATICALLY FOCUSED IMAGE-TUBE INPUT SECTION, A FLOOD GUN FOR CANCELLING OUT AMBIENT INFORMATION, A STORAGE-TARGET CAPABLE OF GOING OVER THE FIRST CROSS-OVER ONLY WHEN THE THRESHOLD SET BY THE FLOOD-GUN IS EXCEEDED, AND AN ALL ELECTROSTATIC VIDICON-TYPE GUN WHICH WILL BE USED TO SCAN THE REVERSE SIDE OF THE STORAGE-TARGET AND GENERATES AN OUTPUT SIGNAL ONLY AT DISCRETE POINTS ON THE STORAGE-TARGET WHOSE POTENTIAL EXCEEDS THE FIRST CROSSOVER POTENTIAL. (AUTHOR) (U)

AD-712 869 20/11 20/5
CATHOLIC UNIV OF AMERICA WASHINGTON D C STRESS ANALYSIS LABS

DEVELOPMENT AND APPLICATION OF METHODS OF EXPERIMENTAL MECHANICS. INTERPRETATION OF FRINGES IN STRESS-HOLO-INTERFEROMETRY. (U)

DESCRIPTIVE NOTE: REPT. NO. 24, JAN-JUL 70, JUL 70 55P SANFORD,R. J. ;DURELLI,A. J. ;
CONTRACT: NONR-2249(06)
PROJ. NR-064-452, CUA-4.047.05

UNCLASSIFIED REPORT

DESCRIPTORS: (*STRESSES, STEREOSCOPIC PHOTOGRAPHY), (*STEREOSCOPIC PHOTOGRAPHY, *LASERS), PHOTOELASTICITY, INTERFEROMETERS, TEST METHODS, VECTOR ANALYSIS, MATRIX ALGEBRA (U)

IDENTIFIERS: *HOLOGRAPHY, *INTERFEROMETRIC HALOGRAPHY, INTERFERENCE PATTERNS, DOUBLE EXPOSURE, COMPUTERIZED SIMULATION (U)

PREVIOUS STUDIES HAD CONCLUDED THAT STRESS-HOLO-INTERFEROMETRY PATTERNS CONSIST OF THE INDEPENDENT SUPERPOSITION OF THE ISOPACHIC FAMILY (WITH HALF ORDER FRINGE SHIFTS) AND THE ISOCHROMATIC FAMILY. IT IS SHOWN HERE THAT THIS INTERPRETATION IS NOT ALWAYS VALID AND CAN RESULT IN SERIOUS ERRORS IN SOME CASES. IN PARTICULAR, IT IS DEMONSTRATED THAT THE POSITION AND EVEN THE EXISTENCE OF THE FRINGES ARE AFFECTED BY THE INTERACTION OF THE ISOPACHICS AND ISOCHROMATICS. THIS EFFECT IS MOST PRONOUNCED WHEN THE TWO FAMILIES OF FRINGES ARE NEARLY PARALLEL AND OF APPROXIMATELY THE SAME SPATIAL FREQUENCY. THE INDEPENDENT SUPERPOSITION INTERPRETATION IS MOST ACCURATE WHEN THE TWO FAMILIES OF FRINGES ARE ORTHOGONAL, WHATEVER THE RATIO OF SPATIAL FREQUENCIES MIGHT BE. THESE PROPERTIES ARE ILLUSTRATED USING COMPUTER GENERATED HOLOGRAPHIC INTERFERENCE PATTERNS. IN AN APPENDIX THE GENERAL THEORY OF STRESS-HOLO-INTERFEROMETRY IS PRESENTED USING MATRIX VECTOR METHODS. THE RESULT OF THIS ANALYSIS IS A GENERAL EXPRESSION FOR THE OBSERVED LIGHT INTENSITY OF A STRESS-HOLOGRAPHIC-INTERFERENCE PATTERNS FOR ANY ARRANGEMENT OF THE POLARIZATION OPTICAL ELEMENTS. THE ANALYSIS ALSO EXPLAINS THE ORIGIN OF EACH OF THE TERMS IN THE LIGHT INTENSITY EXPRESSION. (AUTHOR) (U)

AD-713 545 14/2 11/4
ARMY WEAPONS COMMAND ROCK ISLAND ILL

HOLOGRAPHIC INSPECTION OF LAMINATE BONDS, (U)

1970 14P IVERSEN,R. J. ;MCGARVEY,J. W. ; GARDNER,L. B. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*LAMINATES, *NON-DESTRUCTIVE TESTING), STEREOSCOPIC PHOTOGRAPHY, LASERS, METALS, RUBBER, LAMINATED PLASTICS, DEFECTS(MATERIALS) (U)

IDENTIFIERS: *HOLOGRAPHY, VOIDS (U)

THE PAPER DISCUSSES THE HOLOGRAPHIC DETECTION OF BONDING VOIDS IN RUBBER-TO-METAL, PLASTIC-TO-METAL, AND METAL-TO-METAL LAMINATES BY OBSERVATION OF STRESS-INDUCED DEFORMATIONS OF THE LAMINATE SURFACE. (AUTHOR) (U)

AD-714 510 6/4
STANFORD UNIV CALIF STANFORD ELECTRONICS LABS

ACTION-ORIENTED MEMORY SUBSERVING PERCEPTION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
24 AUG 70 49P ARBIB,MICHAEL A. ;DEV,PARVATI ;
DIDDAY,RICHARD L. ;
CONTRACT: N00014-67-A-0112-0044

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH MASSACHUSETTS UNIV., AMHERST. DEPT. OF COMPUTER AND INFORMATION SCIENCES AND COLORADO STATE UNIV., FORT COLLINS. DEPT. OF MATHEMATICS AND STATISTICS.

DESCRIPTORS: (*BRAIN, COMPUTER LOGIC), (*MEMORY, THEORY), (*SENSORY PERCEPTION, DATA PROCESSING SYSTEMS), NERVE CELLS, INTERACTIONS, STIMULATION, SEQUENCES, MOTOR REACTIONS, MATHEMATICAL MODELS (U)

IDENTIFIERS: LONG TERM MEMORY, SHORT TERM MEMORY, SLIDE BOXES, HOLOGRAMS (U)

THE DOCUMENT HOLDS THAT THE BRAIN MAY BE VIEWED AS A LAYERED COMPUTER, WITH LONG-TERM MEMORY SERVING TO ENSURE THE CORRELATION OF SENSORY FEATURES IN THE SENSORY LAYERS WITH OUTPUT FEATURE CLUSTERS IN THE MOTOR LAYERS WHICH CAN DETERMINE ACTION APPROPRIATE TO OBJECTS IN THE ENVIRONMENT; WHILE SHORT-TERM MEMORY RESIDES IN MAINTAINED ACTIVITY OF OUTPUT FEATURE CLUSTERS WHICH MAY BE APPROPRIATE THOUGH UNCORRELATED WITH CURRENT SENSORY INPUT. SLIDE-BOX AND HOLOGRAM METAPHORS ARE DISCUSSED. (AUTHOR) (U)

AD-714 563 5/9
MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

EDUCATIONAL TECHNOLOGY PROGRAM. (U)

DESCRIPTIVE NOTE: QUARTERLY TECHNICAL SUMMARY REPT. 1 JUN-31 AUG 70,
15 SEP 70 19P FRICK,FREDERICK C. 1
CONTRACT: AF 19(628)-5167
PROJ. AF-649L
MONITOR: ESD TR-70-259

UNCLASSIFIED REPORT

DESCRIPTORS: (*TEACHING METHODS, PROGRAMMING(COMPUTERS)), (*TEACHING MACHINES, MILITARY TRAINING), CONTROL PANELS, ADAPTIVE SYSTEMS, PROGRAMMED INSTRUCTION, PHOTOGRAPHIC PROJECTORS, MICROFICHE, ACOUSTIC EQUIPMENT, RECORDING SYSTEMS, OPTICAL SCANNING, COMPUTER LOGIC, AIR FORCE RESEARCH, LASERS (U)

IDENTIFIERS: *LINCOLN TRAINING SYSTEMS, COMPUTER AIDED INSTRUCTION, *HOLOGRAPHY, RANDOM ACCESS, HANDICAPPED PERSONNEL (U)

THE DOCUMENT REPORTS ON WORK WHICH HAS BEEN DIRECTED PRIMARILY AT COMPONENT DEVELOPMENT FOR LINCOLN TRAINING SYSTEM LTS-2 AND INVESTIGATION OF VARIOUS INSTRUCTIONAL STRATEGIES UTILIZING LTS-1 AND AIMED AT FIRMING UP SYSTEM SPECIFICATIONS FOR LTS-2. A SPECIAL STUDY OF THE POTENTIAL APPLICATION OF TECHNOLOGY TO EDUCATION FOR THE HANDICAPPED WAS CARRIED OUT DURING THE QUARTER. (AUTHOR) (U)

AD-714 610 20/4 1/1 14/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF ASYMMETRIC THREE-DIMENSIONAL DENSITY FIELDS IN FREE JET FLOW. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
JUN 70 156P MATULKA,ROBERT DALE ;
PROJ. A33-330-551/69

UNCLASSIFIED REPORT

DESCRIPTORS: (*THREE-DIMENSIONAL FLOW, *JETS), (*FLOW VISUALIZATION, *INTERFEROMETERS), LASERS, STEREOSCOPIC PHOTOGRAPHY, AERODYNAMICS, DENSITY, SUPERSONIC FLOW, THESES (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY, ASYMMETRY (U)

THE SUCCESSFUL APPLICATION OF HOLOGRAPHIC INTERFEROMETRY, AND AN ASSOCIATED MATHEMATICAL REDUCTION PROCESS, TO THE DETERMINATION OF AN ASYMMETRIC THREE-DIMENSIONAL DENSITY FIELD OF AN AERODYNAMIC PHENOMENON IS REPORTED. AN INTEGRAL INVERSION METHOD FROM THE FIELD OF PLASMA PHYSICS WAS COMPUTERIZED, EXTENSIVELY EVALUATED AND APPLIED TO THE DETERMINATION OF FUNCTIONS, BOTH AXISYMMETRIC AND ASYMMETRIC, WHICH SIMULATE AERODYNAMIC DENSITY FIELDS. THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY WAS EXTENDED TO PROVIDE MULTIPLE HOLOGRAMS ABOUT A TEST REGION, WITH SUFFICIENT COVERAGE TO PROVIDE INTERFEROMETRIC DATA FOR THE SUCCESSFUL SOLUTION OF THE DENSITY FIELD. THE ANALYTICAL AND EXPERIMENTAL METHODS DEVELOPED WERE APPLIED TO AN EXPERIMENTAL AXISYMMETRIC TEST FIELD, THE SUPERSONIC FLOW FROM A FREE JET, AND SHOWN TO BE COMPARABLE TO A PREVIOUS SOLUTION OBTAINED BY THE ABEL INVERSION METHOD. FURTHER, THE FREE JET WAS TILTED TO PROVIDE A TEST FIELD WHICH WAS ASYMMETRIC IN THE PLANE OF SOLUTION. COMPARISON OF THE RESULTING ASYMMETRIC SOLUTION WAS SHOWN TO BE SELF-CONSISTENT WITH THE PREVIOUSLY OBTAINED AXISYMMETRIC SOLUTION. (AUTHOR) (U)

AD-715 916 14/5 14/2
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

HOLOCAMERA FOR EXAMINATION OF WATER DROPLETS IN A LARGE HIGH ALTITUDE TEST CELL. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 70 36P FARMER,W. M. ;BURGESS,K. S. ;
TROLINGER,J. D. ;
REPT. NO. AEDC-TR-70-181
CONTRACT: F40600-71-C-0002
PROJ. AF-4344, ARO-BC5016
TASK: 434432

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO, INC., TULLAHOMA, TENN. REPT. NO. ARO-OMD-TR-70-181.

DESCRIPTORS: (*DROPS, FLOW VISUALIZATION), (*SPECIAL PURPOSE CAMERAS, STEREOSCOPIC PHOTOGRAPHY), GAS FLOW, TEST METHODS, LASERS, AEROSOLS, PHOTOGRAPHIC FILM (U)

IDENTIFIERS: *HOLOGRAPHY (U)

A SERIES OF EXPERIMENTS WAS PERFORMED IN ENGINE TEST FACILITY PROPULSION DEVELOPMENT TEST CELL (J-1) TO SHOW THAT HOLOGRAPHY COULD BE USED TO DETERMINE THE WATER DROPLET INFORMATION NECESSARY TO SIMULATE THE DESIRED CONDITIONS IN AN OPERATIONAL ENVIRONMENT. THE EXPERIMENTS DEMONSTRATED THE FEASIBILITY OF APPLYING HOLOGRAPHY TO THE VISUALIZATION OF SMALL WATER DROPLET FLOW FIELDS IN A TESTING ENVIRONMENT FOR DROPLET SIZES DOWN TO APPROXIMATELY 15 MICRONS. (AUTHOR) (U)

AD-715 935 9/2 14/5
IMAGE INFORMATION INC NORWALK CONN

DATA RECORDING TECHNIQUE FEASIBILITY STUDY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 70 69P MONTUORI,JOHN S. ;SLAKER,FRANK A. ;ENGELDRUM,PETER G. ;THORP,LAWRENCE D. ;
REPT. NO. III-70-001
CONTRACT: F30602-70-C-0203
PROJ. AF-69DB0000
MONITOR: RADC TR-70-189

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA STORAGE SYSTEMS, FEASIBILITY STUDIES), (*DIGITAL RECORDING SYSTEMS, DESIGN), (*MICROFICHE, INFORMATION RETRIEVAL), READING MACHINES, MAN-MACHINE SYSTEMS, LASERS, DIGITAL COMPUTERS, PHOTOGRAPHIC TECHNIQUES, PROGRAMMING(COMPUTERS) (U)

IDENTIFIERS: FREQUENCY LEVEL ENCODING, DIRECT BINARY ENCODING, HOLOGRAPHY (U)

THE REPORT PRESENTS THE FINDINGS OF THE FIRST PART OF A TWO-PART STUDY PROGRAM FOR THE CONCEPTUAL DEVELOPMENT AND DETAILED DESIGN OF A HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR SUBSYSTEM, WHICH S AN ADVANCED MASS MEMORY SUBSYSTEM OF A LARGER INFORMATION PROCESSING SYSTEM. MICROFICHE ARE TO BE USED TO THE STORAGE MEDIUM FOR INFORMATION IN BOTH HUMAN READABLE AND MACHINE READABLE FORMS. THE PURPOSE OF THIS PART OF THE STUDY, WAS TO EVALUATE ALTERNATIVE APPROACHES FOR THE LASER RECORDING AND SUBSEQUENT READOUT OF 2.5 MILLION BITS OF DIGITAL DATA (60 PAGES, 64 LINES PER PAGE, 80 CHARACTERS PER LINE, 8 BITS PER CHARACTER) WITHIN A 1/4 IN. X 4 IN. AREA OF EACH MICROFICHE AT COMPUTER INPUT/OUTPUT RATES. (AUTHOR) (U)

AD-715 983 9/2 14/5 14/3
SINGER-GENERAL PRECISION INC SUNNYVALE CALIF LINK DIV

DIGITAL DATA RECORDING FOR HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. 16 APR-16 JUL 70,
NOV 70 114P SZABO,NICHOLAS S. ;
REPT. NO. UG-7240
CONTRACT: F30602-70-C-0202
MONITOR: RADC TR-70-178

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA STORAGE SYSTEMS, DESIGN), (*DIGITAL RECORDING SYSTEMS, PHOTOGRAPHIC TECHNIQUES), INFORMATION RETRIEVAL, MICROFICHE, DIGITAL COMPUTERS, THIN FILM STORAGE DEVICES, FILM READERS, LASERS (U)

IDENTIFIERS: HOLOGRAPHIC INFORMATION STORAGE, *HOLOGRAPHY (U)

THE REPORT SUMMARIZES WORK PERFORMED DURING THE FIRST NINETY DAYS OF A STUDY CONTRACT FOR THE SYSTEM DESIGN OF AN INFORMATION STORAGE AND RETRIEVAL SYSTEM. THE SYSTEM IS TO BE ABLE TO RECORD BOTH MACHINE READABLE, AS WELL AS HUMAN READABLE INFORMATION. THE FIRST THREE MONTHS OF THE STUDY WERE DEVOTED SOLELY TO INVESTIGATING METHODS FOR RECORDING DIGITAL INFORMATION ON SILVER HALIDE COATED FILM OF MICROFICHE FORMAT. IN PARTICULAR, THE REPORT EXAMINES TWO METHODS OF RECORDING THE INFORMATION: DIRECT LASER RECORDING, USING MANCHESTER CODING AND RECORDING THE INFORMATION IN THE FORM OF A HOLOGRAM. FOR THE CASE OF DIRECT RECORDING, FILM EMULSION FLAWS AND READING ERROR PROBABILITIES ARE EXPLORED TOGETHER WITH METHODS OF CODING THE INFORMATION TO REDUCE REDUNDANCY. THE HOLOGRAPHIC INVESTIGATION CONCENTRATES ON ONE-DIMENSIONAL HOLOGRAMS DERIVED BY SYNTHETIC (COMPUTED) TECHNIQUES. SEVERAL DIFFERENT TECHNIQUES, SUCH AS DETOUR PHASE, SUPERPOSED GRATINGS, AND APERTURE DISTRIBUTION ARE EXAMINED THEORETICALLY. THE REPORT ALSO SUMMARIZES EXPERIMENTAL RESULTS WHICH WERE OBTAINED BY SYNTHETICALLY COMPUTING THE HOLOGRAPHIC IMAGE AND RECORDING IT ON THE LINK IMAGE RESEARCH LABORATORY FLYING SPOT SCANNER SYSTEM. (AUTHOR) (U)

AD-716 276 14/5
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE

FULL VIEW HOLOGRAMS, (U)

31 MAR 70 4P GEORGE,NICHOLAS

CONTRACT: AF-AFOSR-1492-68
PROJ. AF-9768
TASK: 976802
MONITOR: AFOSR 70-2819TR

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN OPTICS COMMUNICATIONS, V1 N9 P457-459 APR 70.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *PHOTOGRAPHIC TECHNIQUES), MONOCHROMATIC LIGHT, COHERENT RADIATION, PHOTOINTERPRETABILITY (U)

IDENTIFIERS: *HOLOGRAMS, *FULL VIEW HOLOGRAMS, HOLOGRAPHY (U)

A MULTIPLE EXPOSURE OR SANDWICHED PLANAR HOLOGRAM IS DESCRIBED ON WHICH IS RECORDED THE ENTIRE WAVEFRONT EMANATING FROM A LOCALIZED OBJECT SPACE. AN OBSERVER WALKING AROUND THIS ILLUMINATED HOLOGRAM SEES AN IMAGE IN SPACE ACCURATELY RENDERING A 3-D OBJECT FOR A SOLID ANGLE OF 4 PI STERADIANS, ASYMPTOTICALLY. WITH LARGE OUTDOOR OBJECTS, THE HOLOGRAPHIC STEREOGRAM IS USED AS AN INTERMEDIARY IN MAKING THE COMPOSITE FULL-VIEW HOLOGRAM. (AUTHOR) (U)

AD-716 571 14/5
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE

REFLECTION-TRANSMISSION FULL-VIEW HOLOGRAMS. (U)

JUL 70 9P GEORGE,NICHOLAS ;

CONTRACT: AF-AFOSR-1492-68
PROJ. AF-9768
TASK: 976802
MONITOR: AFOSR 70-2826TR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE INTERNATIONAL SYMPOSIUM ON THE APPLICATIONS OF HOLOGRAPHY, BESANCON, FRANCE, 6-11 JUL 70.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC TECHNIQUES), REFLECTION, WAVE TRANSMISSION, PHOTOGRAPHIC PLATES, EXPOSURE, LASERS (U)

IDENTIFIERS: *FULL VIEW HOLOGRAMS, *HOLOGRAPHY (U)

A PLANAR HOLOGRAM IS DESCRIBED ON WHICH IS RECORDED THE COMPLETE WAVEFRONT EMANATING FROM AN OBJECT SPACE. IF THE ILLUMINATION IS MONOCHROMATIC, FIRST, TWO SEPARATE HOLOGRAMS ARE MADE FOR LATER TRANSFER TO A MORE CENTRALLY-POSITIONED PLANE. WITH INCOHERENT ILLUMINATION OF A LARGE OBJECT, THEN TWO HOLOGRAPHIC STEREOGRAMS ARE MADE AS THE INTERMEDIARY FOR LATER TRANSFER. THESE FULL-VIEW HOLOGRAMS ARE CLASSIFIED INTO THE FOLLOWING TYPES: (1) REFLECTION-TRANSMISSION, (2) TRANSMISSION-TRANSMISSION, AND (3) REFLECTION-REFLECTION. IT IS SHOWN THAT THE FULL-VIEW RECONSTRUCTION IS APPROXIMATELY WHAT WOULD BE EXPECTED FROM THE LINEAR SUPERPOSITION OF THE OUTPUTS OF THE BASIC TRANSMISSION AND REFLECTION HOLOGRAMS. (AUTHOR) (U)

AD-717 170 9/2 9/5
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE

LIQUID CRYSTAL DISPLAYS FOR MATCHED FILTERING, (U)

DEC 70 19P MACANALLY,RICHARD B. I

CONTRACT: AF-AFOSR-1492-68
PROJ. AF-9768
TASK: 976802
MONITOR: AFOSR 70-2913TR

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING SYSTEMS, STEREOSCOPIC DISPLAY SYSTEMS), COMPUTER STORAGE DEVICES, CRYSTALS, COHERENT RADIATION, TEST METHODS, RELIABILITY(ELECTRONICS), MATCHED FILTERS (U)

IDENTIFIERS: LIQUID CRYSTALS, HOLOGRAPHY, *LIQUID CRYSTAL DISPLAY SYSTEMS, *OPTICAL DATA PROCESSING (U)

DISPLAYS USING DYNAMIC SCATTERING IN A ROOM TEMPERATURE NEMATIC LIQUID CRYSTAL WERE FOUND SUITABLE AS INPUT PLANES BOTH FOR RECORDING MATCHED FILTERS AND FOR CORRELATING WITH MATCHED FILTERS. AUTO-CORRELATION SPOT INTENSITIES EXCEEDING 13 DB ABOVE BACKGROUND AND CROSS-CORRELATION SPOT INTENSITIES LESS THAN 2 DB ABOVE BACKGROUND ARE EASILY OBTAINED FROM TARGET AREAS OF ONLY 20 SQ MM. (AUTHOR) (U)

AD-717 702 20/4 20/13 1/1 14/5
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

HOLOGRAPHIC APPLICATIONS IN SHADOWGRAPH, SCHLIEREN, AND INTERFEROMETRY ANALYSES OF HEAT TRANSFER AND FLUID FLOW TEST SUBJECTS, (U)

NOV 70 42P HAVENER, A. G. I

REPT. NO. ARL-70-0270
PROJ. AF-7064
TASK: 706400

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLOW VISUALIZATION, *LASERS), (*STEREOSCOPIC PHOTOGRAPHY, FLOW VISUALIZATION), (*HEAT TRANSFER, OPTICAL ANALYSIS), SCHLIEREN PHOTOGRAPHY, INTERFEROMETERS, DENSITY, SUPERSONIC FLOW, NOZZLE GAS FLOW (U)

IDENTIFIERS: HOLOGRAPHY, INTERFEROMETRIC HOLOGRAPHY (U)

A FOLDED CONVENTIONAL SCHLIEREN SYSTEM WAS MODIFIED FOR TRANSMISSION HOLOGRAPHY. HOLOGRAMS OF DIFFERENT TEST SUBJECTS, TWO HEAT TRANSFER AND TWO LOW SUPERSONIC FLOW STUDIES, WERE MADE WITH DIRECT UNDIFFUSED LASER LIGHT. EACH EVENT WAS RECONSTRUCTED AS A REAL IMAGE OF THE TEST AND WAS ANALYZED USING ORDINARY SHADOWGRAPH, SCHLIEREN, AND INTERFEROMETRIC TECHNIQUES. SHADOWGRAPH AND SCHLIEREN PHOTOGRAPHS WERE OBTAINED IN TWO WAYS: FIRST, A SINGLE HOLOGRAM WAS DOUBLE EXPOSED AND THE INTERFERENCE WAS RECONSTRUCTED DIRECTLY FROM THE HOLOGRAM; SECOND, TWO HOLOGRAMS WERE SEPARATELY EXPOSED AND SIMULTANEOUSLY REALIGNED, AND THE INTERFERENCE WAS CREATED BETWEEN THE HOLOGRAMS. LOCAL VALUES OF DENSITY DETERMINED FROM THE HOLOGRAPHIC INTERFEROGRAMS AGREED WITH PREVIOUSLY KNOWN OR THEORETICALLY CALCULATED VALUES. THE SHADOWGRAPH AND SCHLIEREN PHOTOGRAPHS AGREED WELL WITH SIMILAR PICTURES OF THE SAME TEST SUBJECTS MADE WITH INCOHERENT WHITE LIGHT. (AUTHOR) (U)

AD-717 775 20/9 20/6
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE

MODERN OPTICS. (U)

DESCRIPTIVE NOTE: INTERIM SCIENTIFIC REPT. 1 JAN-31 DEC 69,
AUG 70 31P GEORGE,NICHOLAS ;
CONTRACT: AF-AFOSR-1492-68
PROJ. AF-9768
TASK: 976802
MONITOR: AFOSR 70-2982TR

UNCLASSIFIED REPORT

DESCRIPTORS: (*LASERS, STEREOSCOPIC PHOTOGRAPHY), (*COHERENT RADIATION, NONLINEAR SYSTEMS), GAS LASERS, IRASERS, AIR POLLUTION, DIFFRACTION GRATINGS, ZEEMAN EFFECT, PHOTOGRAPHIC TECHNIQUES, MATCHED FILTERS, ELECTROOPTICS, REFRACTIVE INDEX, SIGNAL-TO-NOISE RATIO, RAMAN SPECTROSCOPY (U)

IDENTIFIERS: *HOLOGRAPHY, NONLINEAR OPTICS, HOLOGRAMS, SOLID STATE LASERS, LASER SPECTROSCOPY, HELIUM NEON LASERS (U)

THEORETICAL AND EXPERIMENTAL RESEARCH IS BEING CONDUCTED IN THE FIELD OF MODERN OPTICS. THE GOAL IS TO CONTRIBUTE SOLUTIONS FOR IMPORTANT SPECIFIC PROBLEMS IN THE GENERATION, PROPAGATION, PROPERTIES, AND USES OF COHERENT ELECTROMAGNETIC RADIATION. SUBJECTS OF CURRENT INTEREST ARE GROUPED INTO TWO MAIN AREAS: HOLOGRAPHY AND NONLINEAR OPTICS. SPECIFIC NEW AND CONTINUING RESEARCH IN HOLOGRAPHY INCLUDES WIDE-ANGLE HOLOGRAPHIC STEREOGRAPHY AND OTHER FORMS OF HYBRID IMAGING, REAL IMAGE PROJECTION, BLURRED IMAGE RESTORATION, CONVENTIONAL AND REAL-TIME RECORDING MEDIA, AND CASCADED INPUT MATCHED FILTERING. SPECIFIC NEW AND CONTINUING RESEARCH IN NONLINEAR OPTICS INCLUDES SATURATION EFFECTS IN MAGNETICALLY TUNED LASER AMPLIFIERS, LASERS FOR MOLECULAR SPECTROSCOPY AND AIR POLLUTION MONITORING, ELECTRIC-FIELD-INDUCED BIREFRINGENCE IN LIQUIDS, AND THE INTENSITY DEPENDENT INDEX OF REFRACTION IN SOLID DIELECTRICS. THE REPORT SUMMARIZES THE ACTIVITY FOR THE CALENDAR YEAR 1969. (AUTHOR) (U)

AD-718 084 8/2 14/5
PURDUE RESEARCH FOUNDATION LAFAYETTE IND

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING. (U)

DESCRIPTIVE NOTE: INTERIM TECHNICAL REPT. SEP 69-SEP 70,
DEC 70 203P GLASER,GARY H. ;MIKHAIL,EDWARD M. ;
CONTRACT: DAAK02-69-C-0563
PROJ. DA-4-A-061102-B-52-C
MONITOR: ETL CR-70-8

UNCLASSIFIED REPORT

DESCRIPTORS: (*PHOTOGRAMMETRY, *STEREOSCOPIC PHOTOGRAPHY), MAPPING, PHOTOINTERPRETATION, PHOTOGRAPHIC EQUIPMENT, PHOTOGRAPHIC FILM, OPTICAL EQUIPMENT, TEST METHODS (U)

IDENTIFIERS: *HOLOGRAPHY, COMPUTERIZED SIMULATION (U)

THE REPORT IS PRIMARILY CONCERNED WITH THE PRECISION AND POINTING AT A HOLOGRAPHICALLY PRODUCED IMAGE. AFTER CONSIDERATION OF SEVERAL POSSIBILITIES, MEASUREMENTS PERFORMED BY PLACING A SMALL SELF-ILLUMINATED DOT WITHIN THE SPACE OF THE VIRTUAL IMAGE FROM THE HOLOGRAM PROVED TO BE MOST FEASIBLE. IT IS SHOWN THAT IMAGES FROM HOLOGRAMS CAN BE MEASURED BY USE OF A FLOATING DOT IN A MANNER SIMILAR TO THAT USED IN MENSURATION OF PHOTOGRAMMETRIC STEREOMODELS. SIMULATION STUDIES WERE PERFORMED AND INDICATED THAT SHIFTS IN THE RECONSTRUCTION BEAM ANGLE OF UP TO 5 DEGREES COULD BE TOLERATED. A SHIFT OF LARGER THAN 5 DEGREES CAUSED LARGE DISTORTIONS IN THE IMAGE GEOMETRY WHICH COULD NOT BE REMOVED BY A LINEAR TRANSFORMATION. THE INVESTIGATION IS IN THREE PARTS; CONCISE DISCUSSION OF THE PROPERTIES OF HOLOGRAPHY AND PHOTOGRAMMETRY; THEORETICAL IMAGING CHARACTERISTICS; AND MENSURATION. (AUTHOR) (U)

AD-718 101 5/9
MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

EDUCATIONAL TECHNOLOGY PROGRAM. (U)

DESCRIPTIVE NOTE: QUARTERLY TECHNICAL SUMMARY REPT. 1 SEP-30 NOV 70,
15 DEC 70 24P FRICK,FREDERICK C. ;
CONTRACT: F19628-70-C-0230
PROJ. AF-649L
MONITOR: ESD TR-70-401

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED 15 SEP 70, AD-714 563.

DESCRIPTORS: (*TEACHING MACHINES, DESIGN), (*TEACHING METHODS, ADAPTIVE SYSTEMS), EDUCATION, CODING, MONITORS, PROGRAMMING(COMPUTERS), RESEARCH PROGRAM ADMINISTRATION, CONTROL PANELS, MICROFICHE, ACOUSTIC EQUIPMENT, RECORDING SYSTEMS, DIFFRACTION GRATINGS, OPTICAL SCANNING, LASERS, DIGITAL COMPUTERS (U)

IDENTIFIERS: RANDOM ACCESS, *EDUCATIONAL TECHNOLOGY, *LINCOLN TRAINING SYSTEM, AUDIO PRESENTATIONS, HOLOGRAPHY, COMPUTER AIDED INSTRUCTION (U)

THE DOCUMENT REPORTS ON WORK CONCENTRATED ON PLANNING FOR THE KEESLER TRIAL OF THE LINCOLN TRAINING SYSTEM (LTS) AND THE DESIGN OF APPROPRIATE FACILITIES TO SUPPORT THAT EFFORT. CONSIDERABLE PROGRESS IS NOTED IN THE HARDWARE DEVELOPMENT PROGRAM. IN PARTICULAR, TECHNIQUES HAVE BEEN DEVELOPED FOR STORING, ON MICROFICHE, SAMPLED AUDIO SIGNALS AS TWO-LEVEL DIFFRACTION GRATINGS. CONSTRUCTION OF THE LTS-2 BREADBOARD SYSTEM HAS BEGUN. (AUTHOR) (U)

AD-718 386 14/2 14/5
MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES. (U)

DESCRIPTIVE NOTE: SEMIANNUAL REPT. NO. 4, 1 JUN-27 NOV 70,
FEB 71 74P LEITH,EMMETT N. ;VEST,CHARLES M. ;
REPT. NO. 2420-21-P
CONTRACT: DAAG46-69-C-0017, ARPA ORDER-1245

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO SEMIANNUAL REPT. NO. 2, AD-705 228.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), (*NON-DESTRUCTIVE TESTING, PHOTOELASTICITY), INTERFEROMETERS, AIRPLANE PANELS, SURFACE PROPERTIES, DISTORTION, ALUMINUM, PHOTOGRAPHIC TECHNIQUES, HONEYCOMB CORES (U)

IDENTIFIERS: *HOLOGRAPHY, ACOUSTIC HOLOGRAPHY, INTERFEROMETRIC HOLOGRAPHY, MULTIPLE WAVELENGTH HOLOGRAPHY, COMPUTERIZED SIMULATION, WAVE EQUATIONS (U)

THE REPORT DISCUSSES HOLOGRAPHIC SCHEMES FOR THE DETECTION OF FLAWS IN HONEYCOMB PANELS AND ALSO DESCRIBES THE DEVELOPMENT OF A METHOD OF REDUCING THE SENSITIVITY OF HOLOGRAPHIC INTERFEROMETRY OF TRANSPARENT OBJECTS. AN INTERFEROMETRIC SCHEME FOR DETERMINING THE SURFACE ROUGHNESS OF FLAT OBJECTS IS PRESENTED, AND A PLANNED APPLICATION OF THE TECHNIQUE TO CURVED OBJECTS IS DISCUSSED. RECENT ADVANCES IN MULTIPLE-FREQUENCY HOLOGRAPHIC CONTOURING ARE DESCRIBED, AND A COMPARISON OF HOLOGRAPHIC AND SHADOW-MOIRE CONTOURING SCHEMES IS PRESENTED. A COMPUTER SIMULATION OF ACOUSTICAL HOLOGRAPHY AND ITS USE FOR REDUCTION OF ABERRATION ARE ALSO DISCUSSED. (AUTHOR) (U)

AD-718 896 20/5 20/6
OWENS-ILLINOIS INC TOLEDO OHIO CONSUMER AND TECHNICAL PRODUCTS DIV

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS. (U)

DESCRIPTIVE NOTE: SEMI-ANNUAL TECHNICAL REPT. 1 JUL-31 DEC 70,
31 JAN 71 80P BOLING,N. L. ;SPANOUDIS,L. ; WENGERT,P. R. ;
CONTRACT: DAHC15-69-C-0303, ARPA ORDER-1441

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED 31 JUL 70, AD-710 825.

DESCRIPTORS: (*LASERS, OPTICAL GLASS), (*OPTICAL GLASS, RADIATION DAMAGE), NEODYMIUM, DOPING, PLATINUM, OXIDES, THERMAL RADIATION, TEST METHODS, HEAT OF FORMATION, LIGHT PULSES (U)

IDENTIFIERS: Q SWITCHED LASERS, RUBY LASERS, NEODYMIUM GLASS LASERS, HOLOGRAPHY, LASER BEAMS (U)

THE WORK HAS TWO ASPECTS: AN INVESTIGATION OF ELIMINATION OF DAMAGING PLATINUM PARTICLES FROM LASER GLASS MELTED IN PLATINUM CRUCIBLES, AND A STUDY OF THE CAUSES AND PREVENTION OF SURFACE DAMAGE TO LASER GLASS EXPOSED TO HIGH INTENSITY LASER PULSES. WORK PERFORMED ON THE FORMER ASPECT IN THE SPECIFIED PERIOD HAS INVOLVED A THEORETICAL INVESTIGATION -- BASED UPON A LITERATURE SEARCH -- OF ACTIVITY COEFFICIENTS. THE GOAL OF THIS IS DETERMINATION OF PARTIAL PRESSURES OF OXYGEN IN THE MELTING ENVIRONMENT WHICH WILL PREVENT FORMATION OF DAMAGING PLATINUM PARTICLES AND AT THE SAME TIME PREVENT CRUCIBLE ATTACK. THE SURFACE DAMAGE STUDY INVOLVES A SERACH FOR CAUSES OF DAMAGE THROUGH HIGH SPEED HOLOGRAPHY. FURTHER, CHEMICAL TREATMENTS OF GLASS SURFACES ARE BEING EXPLORED AS A MEANS OF INCREASING THE DAMAGE THRESHOLD. WORK ON THIS SURFACE DAMAGE PHASE HAS PRIMARILY INVOLVED DESIGN AND MODIFICATION OF EXPERIMENTAL EQUIPMENT WHICH WILL BE USED. (AUTHOR) (U)

AD-719 090 14/5 20/6
STATE UNIV OF NEW YORK STONY BROOK

A NEW HOLOGRAPHIC IMAGE DEBLURRING METHOD, (U)

11 AUG 70 2P STROKE,G. W. ;HALIOUA,M. ;
CONTRACT: N00014-68-A-0172, NGR-33-015-068

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPONSORED IN PART BY GRANT NSF-GK-4543.
AVAILABILITY: PUB. IN PHYSICS LETTERS, V33A N1 P3-4, 21 SEP 70.

DESCRIPTORS: (*PHOTOGRAPHIC IMAGES, RESOLUTION), STEREOSCOPIC PHOTOGRAPHY, LASERS, INTEGRAL TRANSFORMS (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC IMAGE DEBLURRING (U)

A HOLOGRAM OF A DEBLURRED IMAGE IS OBTAINED IN A SINGLE STEP FROM A BLURRED PHOTOGRAPH BY RECORDING THROUGH A TRANSPARENCY TRANSMITTING: 1/(AMPLITUDE OF FOURIER TRANSFORM OF SPREAD FUNCTION), USING BLURRED PHOTO AND SPREAD FUNCTION AS OBJECT AND REFERENCE. (AUTHOR) (U)

AD-719 055 1475
STATE UNIV OF NEW YORK STONY BROOK

HOLOGRAPHIC IMAGE DEBLURRING, (U)

1970 2P STROKE, GEORGE W. ;
CONTRACT: N00014-68-A-0172

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN OPTICAL SPECTRA, P31-32 NOV 70.

DESCRIPTORS: (*PHOTOGRAPHIC IMAGES, RESOLUTION), STEREOSCOPIC PHOTOGRAPHY, LASERS (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC IMAGE DEBLURRING (U)

BRIEFLY DISCUSSED ARE HOLOGRAPHIC DEBLURRING METHODS WHICH NOW MAKE IT POSSIBLE IN MANY SITUATIONS TO DERIVE MARKEDLY SHARPENED IMAGES FROM FUZZY PHOTOGRAPHS. (U)

AD-719 056 14/5
STATE UNIV OF NEW YORK STONY BROOK

ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING. (U)

17 OCT 70 2P EVINS,D. J. ;MOHR,S. H. ;SAFFIR, A. J. ;HALIOUA,M. ;STROKE,G. W. ;
CONTRACT: N00014-68-A-0172, NSF-GK-4543

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH MATERIALS ANALYSIS CO., PALO ALTO, CALIF.
AVAILABILITY: PUB. IN PHYSICS LETTERS, V33A N6 P377-378, 30 NOV 70.

DESCRIPTORS: (*PHOTOGRAPHIC IMAGES, RESOLUTION), (*ELECTRON MICROSCOPY, RESOLUTION), STEREOSCOPIC PHOTOGRAPHY, LASERS (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC IMAGE DEBLURRING (U)

THE LONG-SOUGHT SOLUTION TO THE DEBLURRING OF ELECTRON MICROGRAPHS HAS BEEN OBTAINED BY A NEW EXTENSION OF THE STROKE ET AL. HOLOGRAPHIC IMAGE DEBLURRING METHODS. THE METHOD IS APPLICABLE TO TRANSMISSIONS AS WELL AS TO SCANNING ELECTRON MICROSCOPY. (AUTHOR) (U)

AD-719 401 6/12 6/16 19/5
JODON ENGINEERING ASSOCIATES INC ANN ARBOR MICH

APPLICATION OF CINEHOLOMICROGRAPHY TO THE STUDY OF MICROCIRCULATION HEMODYNAMICS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 FEB 68-31 DEC 70,
FEB 71 83P VANDER HAAGEN,GARY A. ;WHITLOW,
DANA E. ;
CONTRACT: N00014-68-C-0433
PROJ. NR-105-502

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, BLOOD CIRCULATION), (*BLOOD CIRCULATION, FLOW VISUALIZATION), (*MOTION PICTURE PHOTOGRAPHY, BLOOD CIRCULATION), LASERS, FEASIBILITY STUDIES, PERFORMANCE(ENGINEERING), MEDICAL EQUIPMENT (U)

IDENTIFIERS: *HOLOGRAPHY, CINEMATOGRAPHY, *CINEHOLOMICROGRAPHY (U)

INSTRUMENTATION WAS DEVELOPED FOR THE STUDY OF MICROCIRCULATION HEMODYNAMICS AND RELATED PHYSIOLOGICAL STUDIES OF MAN AND ANIMAL. DEVELOPED WAS A COMPLETE CINEHOLOMICROGRAPHIC RECORDING AND PLAYBACK SYSTEM CAPABLE OF PRODUCING HOLOMICROGRAPHS OF BIOLOGICAL SPECIMENS AT RATES UP TO 30 FRAMES PER SECOND ON 35MM FILM. KEY SYSTEM FEATURES INCLUDE A 1.2 MICRON RESOLUTION OVER THE FULL 3MM BY 3MM BY 10MM FIELD, USE OF A HIGH POWER PULSED ARGON LASER FOR HIGH SPEED OR TIME DIFFERENTIAL HOLOGRAPHY, HIGH ACCURACY 35MM FILM TRANSPORT FOR CONTINUOUS ULTRA-LOW JITTER RECORDING AND PLAYBACK, DELAY LINE ASSEMBLY FOR REDUCTION OF THE LASER SPECKLE COHERENCE PROBLEM, A FULLY ARTICULATED THRE-AXIS MICROSCOPE SYSTEM FOR VIEWING THE RECONSTRUCTED IMAGE, AND PROVISION FOR MOUNTING A 16MM MOVIE CAMERA ON THE MICROSCOPE FOR RECORDING THE RECONSTRUCTED IMAGE. (AUTHOR) (U)

AD-719 855 14/5
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF

STATE OF THE ART AND PROSPECTS OF THE DEVELOPMENT OF HOLOGRAPHY. (U)

1971 14P MIKAELYAN,A. L. |

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF RADIOTEKHNIKA (USSR) V25 N10 P3-12 1970, BY MORRIS D. FRIEDMAN.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), REVIEWS, PHOTOGRAPHIC TECHNIQUES, USSR (U)

IDENTIFIERS: TRANSLATIONS, *HOLOGRAPHY (U)

THE REPORT REVIEWS THE HISTORY OF HOLOGRAPHY AND THE PHOTOGRAPHIC TECHNIQUES INVOLVED. APPLICATIONS ARE GIVEN. (U)

AD-720 322 5/2
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

EUROPEAN SCIENTIFIC NOTES. VOLUME 25, NUMBER 2, (U)

28 FEB 71 36P BANOS,ALFREDO ; JR.;HEWITSON, VICTORIA S. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 25, NUMBER 1, AD-719 901.

DESCRIPTORS: (*SCIENTIFIC RESEARCH, EUROPE), PERIODICALS, REVIEWS, GROUND EFFECT MACHINES, HYDROFOILS, MICROBIOLOGY, GEOPHYSICS, UNIVERSITIES, EDUCATION, OPTICS, PROGRAMMING(COMPUTERS) (U)

IDENTIFIERS: HOLOGRAPHY (U)

THIS IS A MONTHLY PUBLICATION PRESENTING BRIEF ARTICLES CONCERNING RECENT DEVELOPMENTS IN EUROPEAN SCIENTIFIC RESEARCH. IT IS HOPED THAT THESE ARTICLES (WHICH DO NOT CONSTITUTE PART OF THE SCIENTIFIC LITERATURE) MAY PROVE OF VALUE TO AMERICAN SCIENTISTS BY DISCLOSING INTERESTING INFORMATION WELL IN ADVANCE OF THE USUAL SCIENTIFIC PUBLICATIONS. THE ARTICLES ARE WRITTEN BY MEMBERS OF THE SCIENTIFIC STAFF OF ONRL, WITH AN OCCASIONAL ARTICLE CONTRIBUTED BY A VISITING STATESIDE SCIENTIST. (AUTHOR) (U)

AD-720 438 20/11
SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE)
WASHINGTON D C

THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 3, MARCH 1971. (U)

FEB 71 70P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, NUMBER 2, AD-718 186.
AVAILABILITY: PAPER COPY AVAILABLE FROM NAVY PUBLICATIONS AND PRINTING SERVICE OFFICE, BLDG. 157-2, WASHINGTON, D. C. 20390. ANNUAL SUBSCRIPTION $10. 00/YEAR DOMESTIC, $12.50/YEAR FOREIGN.

DESCRIPTORS: (*SHOCK(MECHANICS), REVIEWS), (*VIBRATION, NAVAL RESEARCH), REPORTS, ABSTRACTS, STRUCTURAL PROPERTIES, ACOUSTICS, MODELS(SIMULATIONS), VISCOELASTICITY, FLUID MECHANICS, VIBRATION ISOLATORS, STRUCTURAL PARTS, AIRCRAFT, EARTHQUAKES, SPACECRAFT, SHIPS (U)

IDENTIFIERS: HOLOGRAPHY (U)

CONTENTS: ANALYSIS AND DESIGN (ANALYTICAL METHODS, NUMERICAL ANALYSIS, MODELING, DESIGN INFORMATION); EXCITATION (ACOUSTIC, PERIODIC, RANDOM, SHOCK, SELF-EXCITED); PHENOMENOLOGY (ELASTIC, INELASTIC, VISCOELASTIC, COMPOSITE, DAMPING, FLUID, SOIL); COMPONENTS (ABSORBERS, BEARINGS, CONTROLS, ISOLATORS, PIPES, BEAMS, STRINGS, RODS, PLATES AND SHELLS); SYSTEMS (MECHANICAL, STRUCTURAL ACOUSTIC ISOLATION, AIRCRAFT, BUILDING, EARTH, ENVIRONMENTS, FRAMES, HELICOPTERS, METAL WORKING AND FORMING, RAIL, REACTORS, RECIPROCATING MACHINE, ROAD, ROTORS, SHIP, SPACECRAFT, TURBOMACHINERY). (U)

AD-720 858 20/6 14/5
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY

GENERALIZED FOURIER TECHNIQUES FOR THE THEORY OF LIGHT SCATTERING. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JAN-31 DEC 70,
JAN 71 12P WOLF,EMIL ;
CONTRACT: F19628-70-C-0138
PROJ. AF-8630
TASK: 863001
MONITOR: AFCRL 71-0114

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIGHT TRANSMISSION, FOURIER ANALYSIS), (*STEREOSCOPIC PHOTOGRAPHY, PHOTOINTERPRETABILITY), SOUND SIGNALS, IMAGES, REVIEWS, ABSTRACTS, WAVE FUNCTIONS (U)

IDENTIFIERS: HOLOGRAPHY, SIGNAL PROCESSING, ACOUSTIC IMAGES (U)

THE REPORT PRESENTS A REVIEW OF RESEARCH CARRIED OUT UNDER THE CONTRACT. THE WORK WAS CHIEFLY CONCERNED WITH THE DEVELOPMENT OF SYSTEMATIC TECHNIQUES FOR DETERMINING THE STRUCTURE OF THREE-DIMENSIONAL SEMI-TRANSPARENT OBJECTS FROM THE MEASUREMENTS OF TRANSMISSION FUNCTIONS OF HOLOGRAMS TO WHICH THESE OBJECTS GIVE RISE WHEN THEY ARE ILLUMINATED BY LIGHT BEAMS. RELATED WORK WAS ALSO CARRIED OUT ON SOME ANALOGOUS PROBLEMS INVOLVING SOUND WAVES RATHER THAN LIGHT WAVES AND ON SEVERAL PROBLEMS INVOLVING THE ANGULAR SPECTRAL REPRESENTATION OF WAVEFIELDS. THE REPORT INCLUDES REFERENCES TO ALL PUBLICATIONS REPORTING RESULTS OF THIS RESEARCH, ABSTRACTS OF ALL THE PUBLICATIONS AND LIST OF PERSONNEL THAT ASSISTED WITH THIS WORK. (AUTHOR) (U)

AD-720 899 14/2
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

CRITICAL THOUGHTS ON STRUCTURAL MECHANICS AND NDE, (U)

9 SEP 70 36P ZISFEIN,MELVIN B. ;TARPLEY, WILLIAM B. ;
REPT. NO. C-2231
CONTRACT: F44620-68-C-0068
PROJ. AF-9782
TASK: 978202
MONITOR: AFOSR 70-2870TR

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SYMPOSIUM ON ADVANCED EXPERIMENTAL TECHNIQUES IN THE MECHANICS OF MATERIALS, HELD AT SAN ANTONIO, TEX., ON 9-11 SEP 70.

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, REVIEWS), DEFECTS(MATERIALS), RADIOGRAPHY, ULTRASONIC RADIATION, STEREOSCOPIC PHOTOGRAPHY, LASERS, ANALYSIS (U)

IDENTIFIERS: HOLOGRAPHY (U)

A CRITICAL REVIEW OF NON-DESTRUCTIVE EVALUATION (NDE) IS GIVEN IN GENERAL TERMS AND SPECIFIC EXAMPLES OF NDE TECHNIQUES ARE GIVEN. THESE EMPLOY RADIOGRAPHY (X-RAY AND NEUTRON), ULTRASONICS, PENETRANTS, EDDY CURRENTS, THERMOGRAPHY, LASER INTERFEROMETRY AND HOLOGRAPHY. OTHER TECHNIQUES NOT DISCUSSED IN DETAIL INCLUDE MAGNETICS, MOSSBAUER SPECTRA, AND SPIN RESONANCE. THE STATE-OF-THE-ART IS PRESENTLY TECHNIQUE-ORIENTED, RATHER THAN PROBLEM ORIENTED DUE, IN PART, TO INEFFECTIVE COMMUNICATION LINKS BETWEEN DESIGNER, NDE RESEARCHER AND USER. PROBLEMS AREAS ARE IDENTIFIED WHICH INCLUDE BETTER DATA HANDLING AND INTERPRETIVE TECHNIQUES FOR THE USER AS WELL AS DETECTABILITY AND RESOLUTION CRITERIA; AND CERTAIN MATERIALS PROBLEMS (E.G., LIMITED DUCTILITY MATERIALS); AND AN ESPECIALLY URGENT NEED IS EXPRESSED FOR CONTROL INDICES FOR SURFACE CONTAMINATION BY NDE. METHODS ARE SUGGESTED FOR IMPROVING THE COMMUNICATIONS LINK AND THE IDEA OF 'ANALOGUE' ACCEPTABILITY OR EVALUATION IS STRESSED IN FAVOR OF 'BINARY' GO:NO-GO TYPE DECISIONS. IN THIS WAY THE NDE TECHNIQUES WOULD ENJOY MORE USER ACCEPTANCE AS WELE AS UTILITY. (AUTHOR) (U)

AD-721 021 9/1
ITT ELECTRON TUBE DIV FORT WAYNE IND

PATTERN THRESHOLD RECOGNITION DEVICE. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUL 69-SEP 70,
FEB 71 98P ABRAHAM,J. M. ;HUNTER,R. W. ;
WOLFGANG,L. G. ;
CONTRACT: DAAB07-69-C-0471
PROJ. DA-1-H-662709-A-059
TASK: 1-H-662709-A*05903
MONITOR: ECOM 0471-F

UNCLASSIFIED REPORT

DESCRIPTORS: (*CATHODE RAY TUBES, DESIGN), (*PATTERN RECOGNITION, OPTICAL IMAGES), PHOTOINTERPRETATION, CAMERA TUBES, FILMS, IMAGE CONVERTERS, RELIABILITY(ELECTRONICS), TEST EQUIPMENT, TEST METHODS (U)

IDENTIFIERS: HOLOGRAPHY, THIN FILMS (U)

THE REPORT DETAILS EFFORT DIRECTED TOWARD DEVELOPMENT OF A PATTERN-RECOGNITION DEVICE. THIS VACUUM-TUBE CONSISTS OF AN IMAGE-CONVERTER INPUT, A STORAGE-TARGET WHICH CAN BE SWITCHED OVER THE SECONDARY-EMISSION FIRST-CROSSOVER POTENTIAL IN AREAS OF INTENSE SIGNAL, A FLOOD-GUN TO SUPPRESS BACKGROUND INFORMATION, AND A READ-GUN TO PROVIDE AN ELECTRICAL OUTPUT OF THE STORED INFORMATION. THE REPORT DISCUSSES FOUR MAIN TASKS WHICH CULMINATED IN THE PATTERN-RECOGNITION DEVICE. THE TASK OF TARGET-DEVELOPMENT INCLUDES FABRICATION TECHNIQUES, AN ANALYSIS OF TARGET-OPERATION AND THE RESULTS OF TARGET-EVALUATION. THE TASK TO DEVELOP AN IMAGE-CONVERTER INPUT AND A FLOOD-GUN COLLIMATION-SYSTEM ARE PRESENTED. THE TASK TO DESIGN A SUITABLE READ-GUN IS DISCUSSED, AND FINALLY THE RESULTS OBTAINED ON THE FINAL-DESIGN TUBES ARE PRESENTED. (AUTHOR) (U)

AD-721 815 14/5 14/2 20/11
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER WASHINGTON D C

HOLOGRAPHIC APPLICATIONS IN STRESS ANALYSIS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 71 40P DHIR,SURENDRA K. ;PETERSON, HERBERT A. ;
REPT. NO. NSRDC-3627
PROJ. ZR011-01-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *STRESSES), (*NON-DESTRUCTIVE TESTING, PHOTOGRAPHIC TECHNIQUES), PHOTOELASTICITY, STRUCTURAL PROPERTIES, FATIGUE(MECHANICS), FRACTURE(MECHANICS), STRAIN(MECHANICS), POLARIZATION, PHOTOINTERPRETATION (U)

IDENTIFIERS: *HOLOGRAPHY, STRUCTURAL ANALYSIS (U)

THE REPORT DESCRIBES SOME APPLICATIONS OF THE HOLOGRAPHIC TECHNIQUE TO STRUCTURAL ANALYSIS. EXPERIMENTS WERE CONDUCTED TO DETERMINE THE MERITS AND LIMITATIONS OF THE HOLOGRAPHIC TECHNIQUE AS APPLIED TO PHOTOELASTIC AND STRUCTURAL MODELS. IMPROVEMENTS IN TECHNIQUES ARE PROPOSED TO RELAX THE REQUIREMENTS ON RIGID BODY MOTION DURING LOADING AND TO ELIMINATE THE ANNEALING OF SLICES FROM PHOTOELASTIC MODELS. A METHOD IS ALSO PROPOSED TO IMPROVE THE INTELLIGIBILITY OF COMBINED FRINGE PATTERNS BY VIRTUALLY ELIMINATING THE FRINGES REPRESENTING THE DIFFERENCE OF PRINCIPAL STRESSES. BOTH THEORETICAL AND EXPERIMENTAL METHODS ARE USED TO DEMONSTRATE THE PROPOSED NEW TECHNIQUES. THE REPORT IDENTIFIES THOSE PROBLEM AREAS WHICH ARE OF INTEREST TO THE NAVY AND CAN BE SOLVED VERY EFFECTIVELY BY THE USE OF HOLOGRAPHY. (AUTHOR) (U)

AD-722 028 20/11
SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE)
WASHINGTON D C

THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 4, APRIL 1971. (U)

APR 71 63P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, NUMBER 3, AD-720 438.
AVAILABILITY: PAPER COPY AVAILABLE FROM NAVY PUBLICATIONS AND PRINTING OFFICE, BLDG. 157-2. WASHINGTON, D. C. 20390. ANNUAL SUBSCRIPTION $10. 00/YEAR DOMESTIC, $12.50/YEAR FOREIGN. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*SHOCK(MECHANICS), REVIEWS), (*VIBRATION, NAVAL RESEARCH), REPORTS, ABSTRACTS, STRUCTURAL PROPERTIES, ACOUSTICS, MODELS(SIMULATIONS), VISCOELASTICITY, FLUID MECHANICS, VIBRATION ISOLATORS, STRUCTURAL PARTS, AIRCRAFT, SPACECRAFT, SHIPS, EARTHQUAKES (U)

IDENTIFIERS: HOLOGRAPHY (U)

AD-722 308 17/2
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES). (U)

28 JAN 71 24P RAPOPORT,B. I. IVAINSHTEIN,G. G.

REPT. NO. FTD-MT-24-297-70

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF TEKHNIKA KINO I TELEVIDENIYA (USSR) V14 N6 P51-57 1970, BY RENE E. COURVILLE.

DESCRIPTORS: (*TELEVISION COMMUNICATION SYSTEMS, GRAPHICS), (*STEREOSCOPIC DISPLAY SYSTEMS, TELEVISION COMMUNICATION SYSTEMS), SCANING, LASERS, USSR (U)

IDENTIFIERS: TRANSLATIONS, *HOLOGRAPHY (U)

DISCUSSED ARE POSSIBILITIES OF DESIGNING A HOLOGRAPHIC TELEVISION SYSTEM. GIVEN ARE EXPERIMENTAL TEST RESULTS OF THE SYSTEM DURING THE LONG IMAGE DURATION AND ALSO THE PROSPECTS OF USING SPECIAL TELEVISION SYSTEMS WITH THE TRACKING SCANNING FOR CONTOUR IMAGE TRANSMISSION. (AUTHOR) (U)

AD-722 452 4/2 14/5
TECHNICAL OPERATIONS INC BURLINGTON MASS

PERFORMANCE TESTING OF THE GROUND-BASED AND SNOWFLAKE DISDROMETER SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 10 APR 67-13 JAN 71,
MAR 71 37P BOARDMAN,JOHN I
REPT. NO. TO-B-71-4
CONTRACT: F19628-67-C-0286
PROJ. AF-7605
TASK: 760501
MONITOR: AFCRL 71-0164

UNCLASSIFIED REPORT

DESCRIPTORS: (•METEOROLOGICAL INSTRUMENTS, DESIGN), (•STEREOSCOPIC PHOTOGRAPHY, ATMOSPHERIC PRECIPITATION), TEST METHODS, FOG, SNOW, LASERS, PROGRAMMING(COMPUTERS), MATHEMATICAL MODELS, INTEGRAL TRANSFORMS (U)

IDENTIFIERS: •DISDROMETERS, RUBY LASERS, HOLOGRAPHY, FOURIER TRANSFORMATION (U)

INSTRUMENTATION TO RECORD AND SIZE NATURALLY OCCURRING AEROSOL DROPLETS IN THE 5 TO 100 MICRON DIAMETER SIZE RANGE HAS BEEN CONSTRUCTED AND TESTED. TWO SYSTEMS WERE CONSTRUCTED, THE GROUND-BASED DISDROMETER AND THE SNOWFLAKE DISDROMETER. IN THE GROUND-BASED DISDROMETER, AN OPTICAL FOURIER TRANSFORM OF THE SAMPLE VOLUME IS TAKEN. THE FOURIER TRANSFORM IS SAMPLED ELECTRONICALLY AND, THROUGH A MATHEMATICAL INVERSION PERFORMED IN A COMPUTER, THE NUMBER AND SIZE OF THE FOG DROPLETS ARE COMPUTED DIRECTLY. THIS TYPE OF SYSTEM IS CAPABLE OF RECORDING FOG DISTRIBUTIONS WITHOUT THE NECESSITY OF MANUALLY COUNTING AND SIZING THE PARTICLES. IN THE SNOWFLAKE DISDROMETER, A PULSED RUBY LASER ILLUMINATES THE SAMPLE VOLUME, AND THE LASER BEAM IS INTERFERED WITH A REFERENCE BEAM TO FORM AN OFF-AXIS FRAUNHOFER HOLOGRAM. THE SHORT TIME PULSE OF THE LASER STOPS THE MOTION OF THE PARTICLES AND PROVIDES AN INSTANTANEOUS SAMPLING PERIODICALLY OVER THE HISTORY OF THE PARTICLES. WHEN RECONSTRUCTED, THE HOLOGRAM PROVIDES RESULTS COMPARABLE TO HIGH RESOLUTION PHOTOGRAPHY WITH VASTLY IMPROVED DEPTHS OF FIELDS UP TO 20 INCHES. (AUTHOR) (U)

AD-723 632 14/5 14/2
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

A TECHNIQUE FOR OBTAINING IMPROVED REAL-TIME HOLOGRAPHIC INTERFEROMETRIC DATA USING PULSE MODULATED ILLUMINATION. (U)

DESCRIPTIVE NOTE: SUMMARY REPT. NOV 69-SEP 70, OCT 70 69P ADAMS,FRANK D. ;MADDUX,GENE E. ;
REPT. NO. AFFDL-TR-70-173
PROJ. AF-1467
TASK: 146702

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), (*NON-DESTRUCTIVE TESTING, STRUCTURAL PARTS), TEST METHODS, TEST EQUIPMENT, CANTILEVER BEAMS, AIRFRAMES, VIBRATION, THERMAL STRESSES, FATIGUE(MECHANICS), CRACKS, BUCKLING(MECHANICS), DEFECTS(MATERIALS), REAL TIME (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, REAL TIME HOLOGRAPHY, HOLOGRAPHY (U)

CALCULATIONS AND EXPERIMENTS WERE PERFORMED TO SHOW THAT THE FRINGE PATTERNS ON A VIBRATING STRUCTURE, AS OBSERVED USING REAL-TIME HOLOGRAPHIC INTERFEROMETRY, HAS A SUBSTANTIALLY INCREASED CONTRAST RATIO IF THE LASER ILLUMINATION IS AMPLITUDE MODULATED BY A SEQUENCE OF PULSES WHICH ARE SYNCHRONIZED WITH THE VIBRATION. THE TIME AND EFFORT REQUIRED TO OBTAIN INTERFEROMETRIC DATA USING THIS METHOD IS AN ORDER OF MAGNITUDE LESS THAN THAT NEEDED WHEN USING TIME-AVERAGE HOLOGRAPHIC INTERFEROGRAMS. POTENTIAL APPLICATIONS INCLUDE EXPERIMENTAL STUDIES OF FATIGUE DAMAGE, CRACK DETECTION AND PROPAGATION, FLAW DETECTION IN COMPOSITE AND HONEYCOMB STRUCTURES AS WELL AS VIBRATION ANALYSIS OF STRUCTURAL MEMBERS. (AUTHOR) (U)

AD-724 127 13/7
ALABAMA UNIV HUNTSVILLE DIV OF GRADUATE STUDIES AND RESEARCH

RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 DEC 69-31 DEC 70,
MAR 71 163P SHIH,CORNELIUS C; MONFETTE, PHILLIP ;MARSHALL,LARRY ;DUGGAN,JOHN B. ;DURHAM,JOSEPH E. ;
CONTRACT: DAAH01-70-C-0342

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, AD-724 126.

DESCRIPTORS: (*FLUID AMPLIFIERS, FLOW VISUALIZATION), (*SECONDARY INJECTION, FLUIDICS), (*THRUST VECTOR CONTROL SYSTEMS, SECONDARY INJECTION), ROCKET MOTOR NOZZLES, CONICAL NOZZLES, FLOW FIELDS, SUPERSONIC FLOW, DOPPLER EFFECT, TEST METHODS (U)

IDENTIFIERS: FLUERICS, HOLOGRAPHY (U)

MUCH WORK HAS BEEN DONE IN INVESTIGATING THE EFFECTS OF SECONDARY INJECTION INTO A SUPERSONIC FLOW FIELD FOR A FLAT PLATE AND TWO-DIMENSIONAL NOZZLE. FOR ACTUAL APPLICATION, HOWEVER, IT IS IN THE CONCIAL ROCKET NOZZLE WHERE THE MOST INTEREST LIES. SEVERAL VARIABLES CAN AFFECT THE RESULTING SIDE FORCE FROM SECONDARY INJECTION. THERE ARE: FLOW RATE OF SECONDARY INJECTANT, SONIC OR SUPERSONIC INJECTION, LOCATION OF INJECTION PORT, INJECTION PRESSURE AND ANGLE OF INJECTION. TO INVESTIGATE THE EFFECT OF ALL OF THESE VARIABLES AT THE SAME TIME WOULD BE QUITE DIFFICULT. 9IT WAS THEREFORE DECIDED TO BEGIN WITH ONLY A FEW OF THESE VARIABLES: FLOW RATE OF SECONDARY INJECTANT, LOCATION OF INJECTION PORT AND SONIC CONDITION FOR THE INJECTANT. THE NOZZLE USED FOR THE DATA PRESENTED IN THIS REPORT IS SHOWN. EACH TIME A LARGER FLOW RATE WAS DESIRED FOR A SPECIFIC LOCATION, THE HOLE WAS SIMPLY DRILLED LARGER. LIKEWISE, EACH TIME A NEW LOCATION WAS DESIRED, THE PREVIOUS HOLE WAS FILLED AND THE NEW HOLE SIZE AND LOCATION WAS DRILLED. THE LIMITATIONS OF THIS METHOD ARE OBVIOUS. ONLY SO MANY HOLES CAN BE DRILLED SAFELY IN A NOZZLE OF THIS SIZE.

AD-724 698 20/13 14/5
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO
SCHOOL OF ENGINEERING

HOLOGRAPHIC-INTERFEROMETER INVESTIGATION OF FREE-CONVECTION FROM A NON-UNIFORMLY-HEATED VERTICAL PLATE. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 71 73P BAKER,LARRY M. I
REPT. NO. GA/ME/72-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*CONVECTION(HEAT TRANSFER), *STEREOSCOPIC PHOTOGRAPHY), PHOTOGRAPHIC TECHNIQUES, INTERFEROMETERS, THESES, FLAT PLATE MODELS (U)

IDENTIFIERS: HOLOGRAPHY, *HOLOGRAPHIC INTERFEROMETRY (U)

HOLOGRAPHIC INTERFEROGRAMS WERE MADE OF THE LAMINAR FREE-CONVECTION BOUNDARY-LAYER PRODUCED BY A VERTICAL FLAT PLATE WITH A NON-UNIFORM WALL-TEMPERATURE DISTRIBUTION. A TRANSMISSIVE-DIVERGING-DIFFUSE-SCENE-BEAM TECHNIQUE WAS USED. PHOTOGRAPHS AND RELATIVE POSITIONS OF THE FEATURES OF THE RECONSTRUCTED SCENE WERE OBTAINED USING THE PRIMARY REAL IMAGE, AND USING THESE PHOTOGRAPHS, BOUNDARY-LAYER TEMPERATURE PROFILES AND AVERAGE HEAT-TRANSFER RATES WERE PREDICTED THAT AGREE WITH THEORETICALLY PREDICTED VALUES TO WITHIN 10%. THE FOCUS POSITION OF THE FRINGE PATTERN RELATIVE TO THE RECONSTRUCTED PLATE APPEARED TO COINCIDE WITH THE POSITION RELATIVE TO THE ACTUAL PLATE OF THE CENTROID OF THE GEOMETRIC SHAPE DEFINED BY THE WALL-TEMPERATURE AND AMBIENT TEMPERATURE VRS. WALL-POSITION PLOT. (AUTHOR) (U)

AD-725 159 8/7 14/5 19/4 17/10
TRW SYSTEMS GROUP REDONDO BEACH CALIF APPLIED MECHANICS LAB

HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE. (U)

DESCRIPTIVE NOTE: FINAL REPT., 4 JUN 69-31 DEC 70, 21 MAY 71 132P
APRAHAMIAN,ROBERT ;JACOBY,JEROLD J. ;O'KEEFE,JOHN D. ;AHRENS,THOMAS J. ;
CONTRACT: DASA01-69-C-0152, ARPA ORDER-1468
MONITOR: DASA 2608

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRANITE, SHOCK WAVES), (*SHOCK WAVES, STEREOSCOPIC PHOTOGRAPHY), (*UNDERGROUND EXPLOSIONS, DETECTION), MECHANICAL PROPERTIES, ALUMINUM, PHOTOGRAPHIC EQUIPMENT, TEST METHODS, EQUATIONS OF STATE, LOADING(MECHANICS) (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY (U)

THREE TECHNIQUES OF HOLOGRAPHIC INTERFEROMETRY WERE DEVELOPED TO STUDY THE REPSONSE OF GEOLOGICAL MATERIALS TO PROPAGATING STRESS WAVES. TWO OF THESE TECHNIQUES, STORED-BEAM INTERFEROMETRY AND DOUBLE-EXPOSURE INTERFEROMETRY, WERE FOUND EFFECTIVE WHEN APPLIED TO STUDYING SMALL-AMPLITUDE WAVE PROPAGATION. THE THIRD TECHNIQUE, A FORM OF TIME-AVERAGE HOLOGRAPHIC INTERFEROMETRY, WHICH PRODUCED FRINGES RELATING TO VELOCITIES, WAS EMPLOYED WHEN STUDYING HIGHER STRESS LEVELS (UP TO 30 KB). LOW AMPLITUDE STRESS WAVES WERE GENERATED BY PENDULUM IMPACTS; A GAS GUN WAS USED TO OBTAIN HIGHER STRESS LEVELS. A COMPLETE DESCRIPTION OF EACH TECHNIQUE IS GIVEN HEREIN, TOGETHER WITH A COMPARISON OF EXPERIMENTAL RESULTS (USING WESTERLY GRANITE) AND THEORETICAL PREDICTIONS. (AUTHOR) (U)

AD-725 748 14/2 14/5 20/11
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB OHIO

TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. SEP 69-SEP 70, MAR 71 45P MADDUX,GENE E. ;CORWIN,RICHARD R. ;
REPT. NO. AFFDL-TR-70-157
PROJ. AF-1467
TASK: 146702

UNCLASSIFIED REPORT

DESCRIPTORS: (*STRUCTURAL SHELLS, NON-DESTRUCTIVE TESTING), (*DEFORMATION, *STEREOSCOPIC PHOTOGRAPHY), LASERS, INTERFEROMETERS, LOADING(MECHANICS), CYLINDRICAL BODIES, STRESSES, VECTOR ANALYSIS (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, CYLINDRICAL SHELLS, *HOLOGRAPHY (U)

HOLOGRAPHIC INTERFEROMETRY HAS REACHED A STATE OF PRACTICAL APPLICATION WHEREIN MANY DIFFERENT STRUCTURAL DEFORMATIONS HAVE BEEN RECORDED. SOME OF THESE RECORDINGS CAN BE INTERPRETED BY CASUAL OBSERVATION WHILE OTHERS REQUIRE A DETAILED MATHEMATICAL ANALYSIS TO CONVERT FRINGE PATTERNS INTO DISPLACEMENT DATA. A FEW INVESTIGATORS HAVE PROPOSED DIFFERENT MATHEMATICAL MODELS FOR FRINGE FORMATION RESULTING FROM SURFACE DISPLACEMENTS. MOST OF THESE MODELS, HOWEVER, DO NOT ADEQUATELY REPRESENT REALISTIC STRUCTURES. THE REPORT IS CONCERNED WITH EXAMINING THESE APPROACHES AND DEVISING A SYSTEMATIC PLAN OF INVESTIGATING DISPLACEMENT DETERMINATION FOR COMPLEX STRUCTURES. (AUTHOR) (U)

AD-726 091 20/6 20/5
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

A COMPARISON OF VARIOUS COHERENT OPTICAL FILTERING OPERATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 71 95P CODY,ROBERT LEE ;
REPT. NO. AEDC-TR-71-137
CONTRACT: F40600-71-C-0002
PROJ. ARO-BC5116

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH ARO, INC., TULLAHOMA, TENN., REPT. NO. ARO-OMD-TR-71-93.

DESCRIPTORS: (*OPTICAL FILTERS, PERFORMANCE(ENGINEERING)), (*COHERENT RADIATION, OPTICAL FILTERS), GAS LASERS, STEREOSCOPIC PHOTOGRAPHY, TEST METHODS, BAND-PASS FILTERS, PHOTOGRAPHIC FILTERS, SCHLIEREN PHOTOGRAPHY, DATA PROCESSING SYSTEMS, FOURIER ANALYSIS, INTEGRAL TRANSFORMS, THESES (U)

IDENTIFIERS: HELIUM NEON LASERS, HOLOGRAPHY, FOURIER TRANSFORMATION (U)

A COMPARISON IS MADE OF DIFFERENT COHERENT OPTICAL FILTERS WITH RESPECT TO THEIR ABILITY TO LOCATE AN EDGE AND IDENTIFY PHASE INFORMATION. THESE DIFFERENT FILTERING METHODS ARE BANDPASS FILTERING, THE SCHLIEREN METHOD, THE HILBERT TRANSFORM METHOD, A LINEAR AMPLITUDE FILTER, AND A DIFFERENTIAL FILTER; THESE FILTERS ARE ONE-DIMENSIONAL. THE DIFFERENTIAL FILTER IS A COMBINATION OF TWO FILTERS, A LINEAR AMPLITUDE FILTER AND A HILBERT TRANSFORM FILTER. A LINEAR AMPLITUDE FILTER IS MADE PHOTOGRAPHICALLY BY A PROGRAMMED EXPOSURE OF FILM TO GIVE THE CORRECT DENSITY VARIATIONS. A HILBERT TRANSFORM FILTER IS A PHASE FILTER WHICH IS ACCOMPLISHED WITH A DIELECTRIC COATING ON GLASS. BANDPASS FILTERING IS ACCOMPLISHED BY USING A WIRE. WITH THE USE OF A RAZOR BLADE, THE SCHLIEREN METHOD IS ACHIEVED. THE COMPARISON OF THESE FILTERS INDICATED THAT BANDPASS FILTERING IS SUPERIOR FOR THE LOCATION OF AN EDGE AND THAT THE HILBERT TRANSFORM METHOD IS BEST FOR IDENTIFYING PHASE INFORMATION. (AUTHOR) (U)

AD-726 369 14/2 14/5 20/5 19/6
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH DEVELOPMENT AND ENGINEERING DIRECTORATE

HOLOGRAPHIC TESTING TECHNIQUES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 71 38P IVERSEN,ROBERT J. ISCHULZ,ROGER D. IARNOLD,RONALD G. I
REPT. NO. AMSWE-RE-71-32
PROJ. DA-1-T-061101-A-91-A

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *STEREOSCOPIC PHOTOGRAPHY), (*GUN BARRELS, NON-DESTRUCTIVE TESTING), VIBRATION, DEFECTS(MATERIALS), COMPOSITE MATERIALS, PHOTOGRAPHIC EQUIPMENT, GAS LASERS, TEST METHODS (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY, HELIUM NEON LASERS (U)

APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY TO VIBRATION ANALYSIS, COMPOSITE COMPONENT EVALUATION, AND PRECISION CYLINDER INSPECTION DEVELOPED UNDER IN-HOUSE LABORATORY INDEPENDENT RESEARCH FUNDING IN THE RESEARCH DIRECTORATE, WEAPONS LABORATORY AT ROCK ISLAND ARE PRESENTED. STROBOSCOPIC HOLOGRAPHY IS COMPARED WITH TIME-AVERAGE HOLOGRAPHY, AND TYPICAL RESULTS ARE PRESENTED. THE RESULTS OF THE HOLOGRAPHIC INSPECTION OF MOLDED GRAPHITE/EPOXY COMPOSITES AND HONEYCOMB PANELS ARE REPORTED. A TECHNIQUE FOR THE COMPARISON OF THE INTERNAL RADIAL DIMENSIONS AND STRAIGHTNESS OF PRECISION CYLINDERS SUCH AS GUN BARRELS IS DESCRIBED ALONG WITH TYPICAL RESULTS. (AUTHOR) (U)

AD-726 902 20/6 14/5
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD

A HOLOGRAPHIC METHOD TO MEASURE SCINTILLATION EFFECTS. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
JAN 71 16P DEITZ,PAUL H. ;EVANS,JOHN M. ;
REPT. NO. BRL-TN-1745
PROJ. RDT/E-1-M-562603-A-286

UNCLASSIFIED REPORT

DESCRIPTORS: (*LIGHT TRANSMISSION, ATMOSPHERIC MOTION), (*INFRARED RADIATION, SCINTILLATION), (*STEREOSCOPIC PHOTOGRAPHY, PHOTOINTERPRETABILITY), GAS LASERS, IRASERS, TURBULENCE (U)

IDENTIFIERS: *HOLOGRAPHY, CARBON DIOXIDE LASERS (U)

A METHOD IS DESCRIBED BY WHICH A WAVE FRONT RECONSTRUCTION TECHNIQUE IS UTILIZED TO RECORD THE EFFECTS OF A TURBULENT MEDIUM ON THE PROPAGATION OF OPTICAL BEAMS. BY THIS TECHNIQUE BOTH AMPLITUDE AND PHASE INFORMATION IN A TWO-DIMENSIONAL CROSS SECTION OF A RECEIVED OPTICAL BEAM ARE RECORDED. THE MODE STRUCTURE OF THE SOURCE IS SEEN NOT TO BE CRITICAL IN THIS APPLICATION. (AUTHOR) (U)

AD-727 160 11/2 14/5 14/2
TRW SYSTEMS GROUP REDONDO BEACH CALIF

HOLOGRAPHIC CHARACTERIZATION FOR CERAMICS. PART I. (U)

DESCRIPTIVE NOTE: FINAL REPT. 13 MAR 69-13 DEC 70, 16 FEB 71 39P ROSZHART,TERRY V. ;PEARSON,DURK J. ;BOHN,JACK R. ;
CONTRACT: N0D019-69-C-0228

UNCLASSIFIED REPORT

DESCRIPTORS: (*CERAMIC MATERIALS, NON-DESTRUCTIVE TESTING), (*NON-DESTRUCTIVE TESTING, *STEREOSCOPIC PHOTOGRAPHY), TEST METHODS, TEST EQUIPMENT, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHIC MICROSCOPY, HOLOGRAPHY, RUBY LASERS (U)

A STUDY OF THE APPLICATION OF A GROUP OF PULSED RUBY HOLOGRAPHIC TECHNIQUES TO A VARIETY OF CERAMIC MATERIALS TESTING PROBLEMS WAS CONDUCTED. A PULSED RUBY LASER SYSTEM CAPABLE OF HOLOGRAPHICALLY IMAGING DYNAMIC, LARGE VOLUME EVENTS IS DESCRIBED. THE SYSTEM WAS COUPLED WITH HOLOGRAPHIC INTERFEROMETRY, MICROSCOPY, AND CORRELATION FOR APPLICATION TO RESIDUAL STRESS MEASUREMENTS; PROPERTY EVALUATION; CRACK PROPAGATION; NONDESTRUCTIVE TESTING; LONG WORKING DISTANCE MICROSCOPY; AND LARGE STRAIN MEASUREMENT. IT IS CONCLUDED THAT PULSED RUBY HOLOGRAPHIC INSTRUMENTATION WILL BECOME A POWERFUL, RUGGED, AND SENSITIVE TOOL FOR MATERIALS RESEARCH AND TESTING. (AUTHOR) (U)

AD-728 211 5/9
MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

EDUCATIONAL TECHNOLOGY PROGRAM. (U)

DESCRIPTIVE NOTE: QUARTERLY TECHNICAL SUMMARY REPT. 1 MAR-31 MAY 71,
15 JUN 71 18P FRICK,FREDERICK C. ;
CONTRACT: F19628-70-C-0230
PROJ. AF-649L
MONITOR: ESD TR-71-190

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED 15 DEC 70, AD-718 101.

DESCRIPTORS: (*TEACHING MACHINES, DESIGN), (*TEACHING METHODS, REVIEWS), SCHEDULING, EDUCATION, COMPUTERS, RECORDING SYSTEMS, READING MACHINES (U)

IDENTIFIERS: HOLOGRAPHY (U)

WORK WAS DEVOTED LARGELY TO EXPERIMENTAL VERIFICATION AND REFINEMENT OF DESIGN DETAILS FOR LTS-2. A SERIES OF MEETINGS WITH PERSONNEL FROM THE 3380TH TECHNICAL TRAINING SCHOOL FIRMED UP SCHEDULES, PROCEDURES AND LESSON MATERIALS FOR THE KESSLER TRIALS. (AUTHOR) (U)

AD-728 341 20/6 14/5
MIAMI UNIV CORAL GABLES FLA DEPT OF PHYSICS

THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER, (U)

1970 6P HIRSCHBERG,J. G. ;MCCLUNEY,W. R. ;HAZELTON,L. R. , JR.;AGGARWAL,A. K. ;
CONTRACT: AF-AFOSR-1496-68
PROJ. AF-9767
TASK: 976703
MONITOR: AFOSR TR-71-2260

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH INDIAN INST. OF TECH., NEW DELHI.
AVAILABILITY: PUB. IN THE PROCEEDINGS, INTERNATIONAL SYMPOSIUM OF HOLOGRAPHY, BESANCON UNIV., FRANCE, 6-11 JUL 70, P3-7 1970.

DESCRIPTORS: (*INTERFEROMETERS, DESIGN), PLASMA MEDIUM, ELECTRON DENSITY, LASERS (U)

IDENTIFIERS: HOMIN(HOLOGRAPHIC MULTIPASS INTERFEROMETERS), HOLOGRAPHIC MULTIPASS INTERFEROMETERS, *PLASMA DIAGNOSTICS, *INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY (U)

A MULTIPLE PASS TWO-BEAM OPTICAL INTERFEROMETER HAS BEEN CONSTRUCTED WITH TEN TIMES THE SENSITIVITY OF A SINGLE PASS INSTRUMENT SUCH AS THE MACH-ZEHNDER. TYPICAL APPLICATIONS INCLUDE MEASUREMENTS OF OPTICAL DENSITY IN A GAS OR PLASMA SAMPLE, AND DETERMINATIONS OF SMALL CHANGES IN FIGURE OF OPTICAL ELEMENTS. DOUBLE EXPOSURE HOLOGRAPHY IS EMPLOYED TO RELAX THE COMPONENT REQUIREMENTS. ADVANTAGES OF THE NEW METHOD ARE HIGH SENSITIVITY, ADAPTABILITY TO LARGE TEST REGIONS AT LOW COST, AND DIRECT QUANTITATIVE MEASUREMENT. (AUTHOR) (U)

AD-728 467 20/5 20/6
OWENS-ILLINOIS INC TOLEDO OHIO CONSUMER AND TECHNICAL PRODUCTS DIV

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS. (U)

DESCRIPTIVE NOTE: SEMI-ANNUAL TECHNICAL REPT. 1 JAN-30 JUN 71,
31 JUL 71 111P BOLING,N. L. ;SPANOUDIS,L. ; WENGERT,P. R. ;
CONTRACT: DAHC15-69-C-0303, ARPA ORDER 1441

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED 31 JAN 71, AD-718 896.

DESCRIPTORS: (*LASERS, OPTICAL GLASS); (*OPTICAL GLASS, RADIATION DAMAGE), COHERENT RADIATION, LIGHT PULSES, PLATINUM, OXIDES, SURFACE PROPERTIES, PLASMA MEDIUM, THERMAL RADIATION, TEST METHODS, HEAT OF FORMATION (U)

IDENTIFIERS: *LASER MATERIALS, LASER BEAMS, SURFACE PHYSICS, Q SWITCHED LASERS, RUBY LASERS, HOLOGRAPHY (U)

THE REPORT DISCUSSES SURFACE AND PARTICULATE DAMAGE TO LASER GLASS BY HIGH POWER LASER PULSES. SURFACE DAMAGE IS STUDIED THROUGH HIGH SPEED HOLOGRAPHY. HOLOGRAMS OF DAMAGED SAMPLES ARE TAKEN WITHIN A FEW HUNDRED NANOSECONDS AFTER DAMAGE. THE PLASMAS AND ACOUSTIC DISTURBANCES ASSOCIATED WITH DAMAGE AND VISIBLE IN THESE HOLOGRAMS ARE ANALYZED IN DETAIL. THE POSSIBILITY OF ELIMINATING DAMAGING PARTICLES FROM LASER GLASS IS EXAMINED IN A THEORETICAL AND EXPERIMENTAL INVESTIGATION. MELTING OF GLASS UNDER REDUCED PARTIAL PRESSURE OF OXYGEN IN PLATINUM IS PRESENTED AS A METHOD FOR ACCOMPLISHING THIS ELIMINATION. ALSO DISCUSSED IN THIS REPORT IS THE DESIGN OF A HIGH POWER, HIGH ENERGY, TEM(00) MODE LASER TO BE USED IN DAMAGE STUDIES. (AUTHOR) (U)

AD-728 802 14/2 21/5 14/5
TRW SYSTEMS GROUP REDONDO BEACH CALIF

AN ANALYTICAL AND EXPERIMENTAL STUDY OF STRESSES IN TURBINE BLADES USING HOLOGRAPHIC INTERFEROMETRY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 23 JUN 70-23 JUN 71, 23 JUL 71 145P APRAHAMIAN,R. ;OVEROYE,K. R. ; EVENSON,D. A. ;HOFMEISTER,L. D. ;
REPT. NO. AM-71-5
CONTRACT: N00019-70-C-0590

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *STEREOSCOPIC PHOTOGRAPHY), (*GAS TURBINE BLADES, STRESSES), JET ENGINES, INTERFEROMETERS, LASERS, FEASIBILITY STUDIES (U)

IDENTIFIERS: *HOLOGRAPHY, *INTERFEROMETRIC HOLOGRAPHY (U)

THE APPLICABILITY OF LASER HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF STRESSES IN TURBINE BLADES WAS INVESTIGATED. EXPERIMENTS INCLUDED CONTINUOUS WAVE HOLOGRAPHIC INTERFEROMETRY OF A STATICALLY LOADED BLADE AT BOTH ROOM AND ELEVATED TEMPERATURES (1400F) AND A VIBRATING BLADE AT ROOM TEMPERATURE. A FINITE ELEMENT COMPUTER MODEL OF THE BLADE WAS USED TO CALCULATE DEFLECTIONS, STRAINS AND STRESSES IN THE BLADE IN RESPONSE TO THE EXPERIMENT LOADS. THE HOLOGRAPHICALLY MEASURED DEFLECTIONS WERE COMPARED TO THE COMPUTED DEFLECTIONS AND FOUND TO BE IN GOOD AGREEMENT. ACTUAL STRESSES WERE THEN TAKEN TO BE THOSE CALCULATED BY THE COMPUTER PROGRAM. THE APPLICABILITY OF HOLOGRAPHIC TECHNIQUES TO THE DETECTION OF FLAWS IN HOLLOW TURBINE BLADES WAS ALSO INVESTIGATED. THE METHODS USED DID NOT REVEAL LOCALIZED FLAWS BUT DID REVEAL THE PRESENCE OF OUT OF TOLERANCE WALL THICKNESSES. THE FEASIBILITY OF OBTAINING HOLOGRAMS OF BLADES ROTATING AT HIGH SPEED WAS INVESTIGATED ANALYTICALLY AND EXPERIMENTALLY. ANALYSIS SHOWED THAT CERTAIN OPTICAL ARRANGEMENTS OR SHORTENED LASER PULSES WERE REQUIRED. EXPERIMENTS WERE PERFORMED IN WHICH HOLOGRAMS WERE SUCCESSFULLY RECORDED, CONFIRMING THE ANALYSIS AND DEMONSTRATING THAT HIGH RATES OF ROTATION DO NOT NECESSARILY DEGRADE HOLOGRAPHIC IMAGES. (AUTHOR) (U)

AD-729 287 14/5

SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS NEW YORK

PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON HIGH-SPEED PHOTOGRAPHY (9TH) HELD AT DENVER, COLORADO ON AUGUST 2-7 1970. (U)

1971 623P HYZER,WILLIAM G. ;CHACE,WILLIAM G. ;

CONTRACT: DAHC19-69-C-0023

UNCLASSIFIED REPORT

AVAILABILITY: PAPER COPY AVAILABLE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS, 9 EAST 41ST STREET, NEW YORK, NEW YORK 10017, $40.00. NO COPIES FURNISHED BY DDC OR NTIS.

DESCRIPTORS: (*HIGH-SPEED PHOTOGRAPHY, *SYMPOSIA), (*TELEVISION EQUIPMENT, HIGH-SPEED PHOTOGRAPHY), (*MOTION PICTURE PHOTOGRAPHY, HIGH-SPEED PHOTOGRAPHY), IMAGE CONVERTERS, HIGH-SPEED CAMERAS, LIGHTING EQUIPMENT, X-RAY PHOTOGRAPHY, STEREOSCOPIC PHOTOGRAPHY (U)

IDENTIFIERS: *HOLOGRAPHY (U)

THE 9TH INTERNATIONAL CONGRESS ON HIGH-SPEED PHOTOGRAPHY WAS HELD IN DENVER, COLORADO, USA, AUGUST 2 THROUGH 7, 1970, UNDER THE SPONSORSHIP OF THE SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS, AND WITH THE COOPERATION OF THE UNITED STATES DEPARTMENT OF DEFENSE. THESE PROCEEDINGS OF THE CONGRESS COMPRISE ALL PAPERS PRESENTED, PERTINENT DISCUSSION GENERATED, AND A CURRENT BIBLIOGRAPHY ON THE SUBJECT OF HIGH-SPEED PHOTOGRAPHY. ALSO INCLUDED IS A LIST OF THE DELEGATES, AN AUTHOR'S INDEX, AND A REPORT ON THE CONGRESS. (U)

AD-729 699 11/2 14/5 14/2
TRW SYSTEMS GROUP REDONDO BEACH CALIF

HOLOGRAPHIC CHARACTERIZATION OF CERAMICS. PART II. (OBSERVATION OF STATIC FATIGUE). (U)

DESCRIPTIVE NOTE: FINAL REPT. 15 MAY 70-15 JUN 71, 15 JUL 71 42P ROSZHART,TERRY V. ;BOHN,JACK R.
;
CONTRACT: N00019-70-C-0136

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART I, AD-727 160.

DESCRIPTORS: (*CERAMIC MATERIALS, NON-DESTRUCTIVE TESTING), (*NON-DESTRUCTIVE TESTING, *STEREOSCOPIC PHOTOGRAPHY), FRACTURE(MECHANICS), CRACK PROPAGATION, TEST EQUIPMENT, LASERS, INTERFEROMETERS, EXPERIMENTAL DESIGN (U)

IDENTIFIERS: INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY, RUBY LASERS (U)

AN EXPERIMENT IS DESCRIBED WHICH USES LIVE FRINGE HOLOGRAPHIC INTERFEROMETRY TO OBSERVE STATIC FATIGUE IN GLASS. A CHARACTERISTIC HOLOGRAPHIC FRINGE PATTERN HAS BEEN OBSERVED WHICH INDICATES THE EXISTENCE AND LOCATION OF MINUTE FLAWS PROPAGATING IN A GLASS SPECIMEN SUBJECTED TO A CONSTANT LOAD. THE FRINGE PATTERN IS OBSERVED CONTINUOUSLY AS THE CRACK PROPAGATES THROUGH THE MATERIAL THEREBY PERMITTING DETECTION OF IMPENDING FAILURE AS MUCH AS 20 MINUTES PRIOR TO SPONTANEOUS FRACTURE. THE RESULTS OF THE EXPERIMENTS DEMONSTRATE THAT LIVE FRINGE HOLOGRAPHIC INTERFEROMETRY OFFERS THE INVESTIGATOR A NEW TECHNIQUE FOR THE DETECTION, OBSERVATION, AND CONTROL OF FLAW GROWTH IN BRITTLE MATERIALS. DUE TO THE COMPLEXITY OF RIGOROUS FRINGE ANALYSIS AND THE LACK OF A USABLE MATHEMATICAL MODEL FOR DEFLECTIONS CAUSED BY A CRACK IN A BENDING BEAM, THE RESULTS OF THESE EXPERIMENTS ARE DISCUSSED IN A SEMI-QUANTITATIVE FASHION. THE ABILITY OF HOLOGRAPHIC INTERFEROMETRY TO OBTAIN BOTH QUALITATIVE AND QUANTITATIVE DATA COUPLED WITH THE HIGHLY COHERENT PULSED RUBY LASER SYSTEM DISCUSSED IN PART I OF THIS PROGRAM COULD PERMIT THE APPLICATION OF THESE TECHNIQUES TO DESIGN ORIENTED FAILURE PROBLEMS AS WELL AS THEORETICAL FRACTURE STUDIES. (AUTHOR) (U)

AD-730 063 20/4 20/5 21/5
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 14 DEC 70-14 JUL 71 ON ITEM 2,
AUG 71 89P ALWANG,WALTER G. ;CAVANAUGH, LAWRENCE A. ;BURR,RONALD J. ;HAUER,ALLAN ;
REPT. NO. PWA-4276
CONTRACT: N00019-69-C-0322
PROJ. R010-04-02

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED JUN 70, AD-870 186L.

DESCRIPTORS: (*FLOW VISUALIZATION, *LASERS), (*AIRCRAFT ENGINES, GAS FLOW), FLOW FIELDS, INTERFEROMETERS, GAS TURBINES, VELOCITY, TURBULENCE (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC VELOCIMETRY, HOLOGRAPHIC INTERFEROMETRY (U)

IN THE PROGRAM TWO NEW OPTICAL METHODS OF FLOW MEASUREMENT WERE EVALUATED FOR EVENTUAL USE IN AIRCRAFT TURBINE ENGINES. THE METHODS STUDIED WERE: HOLOGRAPHIC INTERFEROMETRY FOR VISUALIZATION OF FLOW AND LASER DOPPLER VELOCIMETRY (LDV) FOR POINTWISE MEASUREMENT OF VELOCITY. PROTOTYPE INSTRUMENTS OF EACH TYPE WERE BUILT AND TESTED IN MEASUREMENTS ON A SUPERSONIC CASCADE. IT WAS FOUND THAT DOUBLE-PULSE DIFFUSE-BACKGROUND HOLOGRAPHIC INTERFEROMETRY CAN DISCLOSE THE POSITION OF MOVING DENSITY GRADIENTS SUCH AS BLADE SHOCKS. THE LDV SYSTEM, A DUAL BEAM, DUAL SCATTER SYSTEM CAPABLE OF BOTH FORWARD AND BACK SCATTER OPERATION, WAS FOUND TO BE EFFECTIVE IN MEASURING MEAN VELOCITY AND TURBULENCE INTENSITY. CAPABILITIES AND LIMITATIONS OF BOTH INSTRUMENTS WERE ASSESSED AND REQUIREMENTS FOR INTERNAL MEASUREMENTS IN TURBOMACHINERY DETERMINED. IN GENERAL, IT WAS CONCLUDED THAT THE EQUIPMENT DEVELOPED IS READY FOR APPLICATION IN TURBINE ENGINES. (AUTHOR) (U)

AD-730 269 14/5
HUGHES RESEARCH LABS MALIBU CALIF

FIXING OF PHOTOPOLYMER HOLOGRAMS. (U)

26 JAN 71 3P JENNEY,JOE A.

CONTRACT: F44620-70-C-0092
PROJ. AF-9767
TASK: 976702
MONITOR: AFOSR TR-71-2441

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF THE OPTICAL SOCIETY OF AMERICA, V61 N8 P1116-1117 AUG 71.

DESCRIPTORS: (*PHOTOGRAPHIC RECORDING SYSTEMS, *POLYMERIZATION), (*PHOTOGRAPHIC FILM, *PLASTICS), ULTRAVIOLET RADIATION, DYES, PHOTOGRAPHIC IMAGES, STEREOSCOPIC PHOTOGRAPHY, LASERS, DIFFRACTION, HEAT TREATMENT (U)

IDENTIFIERS: *HOLOGRAMS, HOLOGRAPHY, *PHOTOPOLYMERIZATION IMAGING, *PHOTOPLASTIC RECORDING SYSTEMS (U)

PHOTOPOLYMER RECORDING MATERIALS ARE SELF-DEVELOPING, SO THAT AND EXPOSED HOLOGRAM MUST BE FIXED TO PREVENT IMAGE DEGRADATION FROM EXPOSURE TO THE PLAYBACK BEAM OR ROOM LIGHT. A PREVIOUS COMMUNICATION DISCUSSED UV FIXING OF PHOTOPOLYMER HOLOGRAMS ACCORDING TO THE TECHNIQUE DESCRIBED BY MARGERUM AND CO-WORKERS. THERE ARE DISADVANTAGES TO UV FIXING. THE REPORT BRIEFLY DESCRIBES THE RESULTS OF TWO ALTERNATE FIXING TECHNIQUES THAT OVERCOME SEVERAL OF THE DISADVANTAGES OF UV FIXING. (AUTHOR) (U)

AD-731 087 4/2
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS

FOG DROP-SIZE DISTRIBUTIONS MEASURED WITH A LASER HOLOGRAM CAMERA, (U)

7 JAN 71 7P KUNKEL,BRUCE A. I

REPT. NO. AFCRL-71-0444
PROJ. AF-7605
TASK: 760501

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 16 OCT 70.
AVAILABILITY: PUB. IN JNL. OF APPLIED METEOROLOGY, V10 N3 P482-486 JUN 71.

DESCRIPTORS: (*FOG, PARTICLE SIZE), LASERS, SPECIAL PURPOSE CAMERAS, SAMPLING, VOLUME, PARTICLE SIZE, CLOUDS, STEREOSCOPIC PHOTOGRAPHY (U)

IDENTIFIERS: LASER HOLOGRAM CAMERAS, HOLOGRAPHY, DISDROMETERS (U)

FOG DROP SIZES WERE MEASURED WITH A LASER HOLOGRAM CAMERA. THE CAMERA SAMPLES VOLUMES UP TO 4.5 CC AT A RATE OF FIVE SAMPLES PER MINUTE. THE MEASURED DISTRIBUTION IS RELATIVELY UNAFFECTED BY THE MEASURING TECHNIQUE AS NO SAMPLE COLLECTION OR DILUTION IS INVOLVED. THE SAMPLE-TO-SAMPLE VARIATION OF FOG DROP-SIZE DISTRIBUTIONS IS DISCUSSED. MEAN DROP-SIZE DATA ARE PRESENTED FOR SEVERAL FOG CASES. THE PROBLEMS ENCOUNTERED WITH, AND THE POTENTIAL FUTURE USE OF THIS TECHNIQUE FOR MEASURING FOG AND CLOUD DROPLETS ARE DISCUSSED. (AUTHOR) (U)

AD-731 237 14/2 13/11
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

OPTICAL METHODS FOR CONDUCTING NONDESTRUCTIVE TESTING OF FUEL FILTER ELEMENTS. (U)

DESCRIPTIVE NOTE: SUMMARY REPT. JUL-SEP 70,
JUN 71 31P ROQUEMORE,W. MELVYN ;MARTEL, CHARLES R. ;
REPT. NO. AFAPL-TR-71-16
PROJ. AF-3048
TASK: 304805

UNCLASSIFIED REPORT

DESCRIPTORS: (*FUEL FILTERS, *NON-DESTRUCTIVE TESTING), AIRCRAFT EQUIPMENT, FLOW VISUALIZATION, IMPURITIES, FLUID FLOW, TEST METHODS, SENSITIVITY, PHOTOGRAPHIC TECHNIQUES (U)

IDENTIFIERS: *SHADOWGRAPH PHOTOGRAPHY, *HOLOGRAPHY, SEPARATORS, FUEL CONTAMINATION (U)

TWO OPTICAL METHODS HAVE BEEN INVESTIGATED FOR USE AS A NONDESTRUCTIVE TEST METHOD FOR USE WITH FILTER-SEPARATOR COALESCER ELEMENTS. SHADOWGRAPHS AND HOLOGRAPHIC INTERFEROGRAMS HAVE BEEN SHOWN TO BE USEFUL FOR EXAMINING THE FLOW VARIATIONS OF A GAS FLOWING THROUGH A FILTER ELEMENT. THE TEST GAS, HAVING AN INDEX OF REFRACTION SUBSTANTIALLY DIFFERENT FROM THAT OF AIR, REFRACTS THE LIGHT NEAR THE FILTER SURFACE AND PERMITS GAS FLOW VARIATIONS THROUGH THE FILTER MEDIA TO BE OBSERVED. IT IS ANTICIPATED THAT THE SHAPE OF THE TEST GAS BOUNDARY LAYER AND THE BOUNDARY LAYER THICKNESS WILL PROVIDE INFORMATION ON THE MEDIA'S POROSITY, VOIDS, AND PLUGGED AREAS. INITIAL EXPERIMENTS HAVE CONFIRMED THE SENSITIVITY OF THE TWO OPTICAL METHODS, BECAUSE A 1/16-INCH DIAMETER HOLE DRILLED THROUGH AN ELEMENT WAS EASILY DETECTED. HOWEVER, ADDITIONAL WORK IS NEEDED TO ESTABLISH CORRELATION BETWEEN THE OPTICAL-GAS FLOW, NONDESTRUCTIVE TEST METHOD AND NATURALLY OCCURRING FILTER-ELEMENT DEFECTS. (AUTHOR) (U)

AD-731 294 9/4
PRINCETON UNIV N J DEPT OF ELECTRICAL ENGINEERING

A STUDY OF NETWORK AND SYSTEM SENSITIVITY OF SIGNAL PROCESSORS FOR USE IN AIR FORCE SYSTEMS SUCH AS COMMAND AND CONTROL SYSTEMS. (U)

DESCRIPTIVE NOTE: FINAL SCIENTIFIC REPT. 1 JUL 67-31 AUG 71,
27 SEP 71 12P VALKENBURG,M. E. VAN ;
CONTRACT: AF-AFOSR-1333-67
MONITOR: AFOSR TR-71-2655

UNCLASSIFIED REPORT

DESCRIPTORS: (*INFORMATION THEORY, SIGNALS), PROCESSING, NETWORKS, DIGITAL SYSTEMS, ELECTRIC FILTERS, NONLINEAR SYSTEMS, LINEAR SYSTEMS, STOCHASTIC PROCESSES, MATHEMATICAL MODELS, COMMAND + CONTROL SYSTEMS, INTEGRAL TRANSFORMS (U)

IDENTIFIERS: *SIGNAL PROCESSING, DIGITAL FILTERS, HOLOGRAPHY, FAST FOURIER TRANSFORM (U)

;CONTENTS: SYSTEMS WITH UNKNWON, UNCERTAIN, OR VARYING PARAMETERS; EFFECT OF FINITE WORD LENGTH ON ACCURACY OF DIGITAL SIGNAL PROCESSORS; COMPUTER GENERATED HOLOGRAMS AND SPATIAL FILTERS; RANDOM SIGNAL AND SYSTEMS. (U)

AD-731 310 6/4 9/2
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

ARTIFICIAL INTELLIGENCE. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS NO. 94.
1971 336P
REPT. NO. AGARD-CP-94-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AGARD AVIONICS PANEL TECHNICAL SYMPOSIUM ON 'ARTIFICIAL INTELLIGENCE' HELD IN ROME, ITALY, 24-28 MAY 71. NATO FURNISHED.

DESCRIPTORS: (*ARTIFICIAL INTELLIGENCE, SYMPOSIA), (*PATTERN RECOGNITION, DATA PROCESSING SYSTEMS), MAN-MACHINE SYSTEMS, AIR TRAFFIC CONTROL SYSTEMS, SPACECRAFT, LEARNING MACHINES, INTERFACES, INFORMATION THEORY, DATA TRANSMISSION SYSTEMS, INTERACTIONS, ADAPTIVE CONTROL SYSTEMS, MATHEMATICAL MODELS, COMMAND + CONTROL SYSTEMS, DECISION MAKING, MEDICINE, FRANCE (U)

IDENTIFIERS: IMAGE PROCESSING, ROBOTS, HOLOGRAPHY, CONTROL THEORY (U)

AD-731 964 20/9 20/5
TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES. (U)

SEP 70 6P FRIEDRICH,OTTO ; JR.;WEIGL, FREDERIC ;DOUGAL,ERWIN A. ;
CONTRACT: AF-AFOSR-1792-69
PROJ. AF-4751
MONITOR: AFOSR TR-71-2823

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN PROCEEDINGS OF THE IEEE INTERNATIONAL CONFERENCE ON GAS DISCHARGE, N70 1970.

DESCRIPTORS: (*PLASMA MEDIUM, INTERFEROMETERS), (*LASERS, PLASMA MEDIUM), MAGNETIC PINCH, SHOCK WAVES, REFRACTIVE INDEX, COHERENT RADIATION (U)

IDENTIFIERS: *PLASMA DIAGNOSTICS, LASER PRODUCED PLASMAS, HOLOGRAPHY (U)

A MACH-ZEHNDER INTERFEROMETER ARRANGEMENT UTILIZING COHERENT LASER ILLUMINATION HAS BEEN EMPLOYED FOR MEASUREMENTS OF ELECTRON-ION GASEOUS PLASMA PRODUCED IN ENERGETIC PULSED PINCHES, LASER-PRODUCED PLASMAS, AND IN MEDIA WITH THERMAL AND CONCENTRATION GRADIENTS. DOUBLE-PULSED MACH-ZEHNDER INTERFEROMETRY WAS DEVELOPED TO PROVIDE EFFECTIVE INFINITE-FRINGE INTERFEROGRAMS USING RELATIVELY POOR OPTICS, SIMPLE ALIGNMENT, LOW RESOLUTION FILM, AND A PULSED LASER WITH A STANDARD LINE-WIDTH. TYPICAL, TIME-RESOLVED, MACH-ZEHNDER INTERFEROGRAMS OF DYNAMIC PLASMAS PRODUCED IN A FOUR-STAGE, 5 CM DIAMETER, 20 CM LENGTH, 30 KILO-JOULE STORAGE CAPACITOR BANK, THETA PINCH ARE PRESENTED. IN ANOTHER APPLICATION, THE MACH-ZEHNDER INTERFEROMETER ILLUMINATED WITH A 40 NANOSECOND PULSE-WIDTH, 30 MEGA-WATT, GIANT-PULSE RUBY LASER WAS EMPLOYED TO INVESTIGATE THE FORMATION OF LASER PRODUCED PLASMAS. A 175 MEGAWATT, 3 JOULE, GIANT-PULSE RUBY LASER WAS USED TO PRODUCE ELECTRICAL BREAKDOWN AND TO DEPOSIT SEVERAL JOULES OF ENERGY IN AIR AT STANDARD TEMPERATURE AND GAS PRESSURE. A MULTIPLE-PASS, DOUBLE-EXPOSURE, NON-DIFFUSIVE HOLOGRAPHIC INTERFEROMETRIC TECHNIQUE HAS BEEN DEVELOPED WITH IMPROVED SPATIAL RESOLUTION AND WITH LESS CRITICAL OPTICAL ALIGNMENT.

AD-733 204 14/5 20/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

PROGRESS IN HOLOGRAPHY, (U)

9 SEP 71 58P SMORODINSKII, YA. A. ;SOROKO, L. M. ;

REPT. NO. FTD-HC-23-338-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF USPEKHI GOLOGRAFII (USSR) N5 P1-48 1970.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, LASERS), PHOTOGRAPHIC IMAGES, COHERENT RADIATION, PHOTOGRAPHIC EQUIPMENT, PHOTOGRAPHIC FILM, PHOTOINTERPRETABILITY, USSR (U)

IDENTIFIERS: TRANSLATIONS, *HOLOGRAPHY (U)

THE REPORT CONCERNS THE PROBLEM OF HOW TO RECORD LIGHT SO THAT A MAXIMUM AMOUNT OF INFORMATION ABOUT A GIVEN OBJECT WILL BE CAPTURED. THE PROPERTIES OF LIGHT IN THE FORM OF A WAVE, RAYS, OR LIGHT QUANTA ARE CONSIDERED SEPARATELY FROM THE OTHERS ONLY UNDER CERTAIN CONDITIONS, SINCE SOMETIMES THE QUANTUM PROPERTIES MAY IN A COMPLETELY UNEXPECTED WAY CHANGE INTO WAVE-LIKE PROPERTIES, AND A LIGHT RAY MAY JUST AS UNEXPECTEDLY MANIFEST PURELY WAVE-LIKE CHARACTERISTICS. THE PROPERTIES OF A LIGHT RECEIVER ARE STUDIED, ESPECIALLY THE PROPERTIES OF A PHOTOGRAPHIC FILM. (AUTHOR) (U)

AD-733 257 9/2 20/5 14/5 14/2
TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION. (U)

1971 14P FRIEDRICH,OTTO M. ; JR.;DOUGAL, ARWIN A. ;

CONTRACT: F44620-71-C-0091
PROJ. AF-4751
MONITOR: AFOSR TR-71-2988

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE PROCEEDINGS OF THE INSTRUMENTATION IN THE AEROSPACE INDUSTRY, V17 P141-153 1971.

DESCRIPTORS: (*DATA PROCESSING SYSTEMS, LASERS), (*NON-DESTRUCTIVE TESTING, COHERENT RADIATION), INTERFEROMETERS, STEREOSCOPIC PHOTOGRAPHY, SPECTRUM ANALYZERS, OPTICAL FILTERS, CORRELATORS, PATTERN RECOGNITION, ANALOG COMPUTERS, MECHANICAL PROPERTIES, PHOTOELASTICITY, GAS FLOW (U)

IDENTIFIERS: HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE, INTERFEROMETRIC HOLOGRAPHY, *OPTICAL DATA PROCESSING (U)

RECENTLY DEVELOPED HOLOGRAPHIC TECHNIQUES, OPTICAL DATA PROCESSING PRINCIPLES, AND LASER PROPERTIES BENEFICIAL FOR AEROSPACE INSTRUMENTATION ARE REVIEWED. HIGH INTENSITY, HIGHLY COLLIMATED OR DIRECTIONAL, SPATIAL-AND TEMPORAL-COHERENT OPTICAL BEAMS ARE READILY GENERATED WITH PRESENT LASER SYSTEMS. IN OPTICAL HOLOGRAPHY, BOTH THE PHASE AND THE AMPLITUDE OF OPTICAL WAVES ARE RECORDED AS INTENSITY VARIATIONS THAT ARE PRODUCED BY THE INTERFERENCE OF TWO OR MORE OPTICAL WAVES. OPTICAL DATA PROCESSORS USUALLY EMPLOY THE OPTICAL DIFFRACTION PRODUCED BY A SIMPLE LENS. THE ABILITY OF AN OPTICAL LENS TO PERFORM TWO-DIMENSIONAL FOURIER TRANSFORMS AT THE SPEED OF LIGHT IS AN ADVANTAGE WHICH OPTICAL PROCESSORS HAVE OVER CONVENTIONAL ELECTRONIC SYSTEMS. EXPERIMENTAL AND ANALYTICAL INVESTIGATIONS ARE BEING PERFORMED ON SEVERAL HOLOGRAPHIC TECHNIQUES AND ON THE FOLLOWING OPTICAL DATA PROCESSING SYSTEMS: OPTICAL ANALYZERS, FILTERS, SIGNAL CORRELATORS, PATTERN RECOGNITION UNITS, ANALOG COMPUTERS AND SIMULATORS. (AUTHOR) (U)

AD-733 740 14/2 20/5
ARNOLD ENGINEERING DEVELOPMENT CENTER ARNOLD AIR FORCE STATION TENN

LASER INSTRUMENTATION IN AEDC TEST FACILITIES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 71 36P FRANCIS,DAVID G. ;
REPT. NO. AEDC-TR-71-227

UNCLASSIFIED REPORT

DESCRIPTORS: (*TEST FACILITIES, *LASERS), INSTRUMENTATION, FLOW FIELDS, PARTICLES, PHOTOGRAPHIC TECHNIQUES, FLOW VISUALIZATION, CIRCUITS, EXPERIMENTAL DATA (U)

IDENTIFIERS: HOLOGRAPHY (U)

VARIOUS LASER SYSTEMS BEING USED FOR TESTS IN LABORATORIES AND ENVIRONMENTAL FACILITIES AT AEDC ARE DESCRIBED. THESE SYSTEMS INCLUDE THE LASER DOPPLER VELOCIMETER USED FOR FLOW FIELD DIAGNOSTICS, LASER HOLOGRAPHY USED FOR FLOW FIELD VISUALIZATION AND PARTICLE STUDIES, LASER SPARK GENERATION USED TO MEASURE VELOCITIES IN HIGH SPEED FLOWS, LASER PHOTOGRAPHY USED FOR VISUALIZATION DURING ABLATION TESTS, AND VAPOR SCREEN SYSTEMS USED TO VISUALIZE FLOW PATTERNS AROUND MODELS. SCHEMATICS OF THE SYSTEMS ARE GIVEN, AND SOME RESULTS FROM TESTS WHICH HAVE UTILIZED LASER INSTRUMENTATION ARE PRESENTED. (U)

AD-734 148 14/5 6/12 6/16
MICHIGAN UNIV ANN ARBOR DEPT OF PHYSICS

DEVELOPMENT OF OPTIMAL SYSTEM PROPERTIES FOR PULSED CINEHOLOMICROSCOPY. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 APR 69-31 MAR 71, 31 MAY 71 32P COX,MARY E. ;
CONTRACT: N00014-67-A-0181-0025
PROJ. NR-105-551

UNCLASSIFIED REPORT

DESCRIPTORS: (*MICROSCOPY, STEREOSCOPIC PHOTOGRAPHY), (*STEREOSCOPIC PHOTOGRAPHY, BLOOD CIRCULATION), (*BLOOD CIRCULATION, FLOW VISUALIZATION), (*MOTION PICTURE PHOTOGRAPHY, BLOOD CIRCULATION), (*PHOTOGRAPHIC FILM, STEREOSCOPIC PHOTOGRAPHY), GAS LASERS, MEDICAL EQUIPMENT (U)

IDENTIFIERS: *CINEHOLOMICROSCOPY, *HOLOGRAPHY, ARGON LASERS (U)

THE SYSTEM PARAMETERS OF IMPORTANCE IN PULSED CINEHOLOMICROSCOPY HAVE BEEN IDENTIFIED AND EVALUATED. THE RESEARCH HAS EMPHASIZED THOSE PARAMETERS OF RELEVANCE TO THE CINEHOLOMICROSCOPY SYSTEM AT THE NAVAL MEDICAL RESEARCH INSTITUTE. THE INFLUENCE OF SELECTED PROCESSING VARIABLES ON HOLOGRAPHIC FILM PARAMETERS HAS BEEN THE CENTRAL AREA OF STUDY. FILM TESTS HAVE BEEN DEVELOPED WHICH ARE APPLICABLE IN ALL HOLOGRAPHIC SYSTEMS. LASER PARAMETERS WHICH INFLUENCE IMAGE QUALITY HAVE BEEN IDENTIFIED AND STUDIED. AUXILIARY STUDIES ON ALL ASPECTS OF THE CINEHOLOMICROSCOPY PROJECT HAVE BEEN PERFORMED AS NEEDED. THIS REPORT SUMMARIZES THE RESULTS OF THIS RESEARCH. (AUTHOR) (U)

AD-734 246 20/9 20/5
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO
SCHOOL OF ENGINEERING

DETERMINATION OF SPATIAL AND TEMPORAL ELECTRON DENSITY AND TEMPORAL ELECTRON TEMPERATURE IN LASER-PRODUCED GASEOUS DEUTERIUM PLASMAS. (U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
JUN 71 127P PENDLETON,WINSTON KENT , III;
REPT. NO. DS/PH/71-3

UNCLASSIFIED REPORT

DESCRIPTORS: (•PLASMA MEDIUM, •ELECTRON DENSITY), (•GAS IONIZATION, LASERS), DEUTERIUM, TRANSPORT PROPERTIES, DISTRIBUTION FUNCTIONS, GAS DISCHARGES, INTERACTIONS, REFRACTIVE INDEX, EXCITATION, INTERFEROMETERS, THESES (U)

IDENTIFIERS: ELECTRON ENERGY, DEUTERIUM PLASMAS, LASER PRODUCED PLASMAS, PLASMA DYNAMICS, HOLOGRAPHY (U)

THE TEMPORAL AND SPATIAL ELECTRON DENSITY DISTRIBUTION AND THE TEMPORAL VARIATION OF ELECTRON TEMPERATURE HAVE BEEN DETERMINED IN GASEOUS DEUTERIUM PLASMAS PRODUCED BY A LASER. IN ADDITION TO THESE MEASUREMENTS, MADE DURING LASER IRRADIATION OF THE PLASMA, THE PLASMA GROWTH RATE, LASER-PLASMA ABSORPTION AND REFLECTION INTERACTION, AND PRESSURE DEPENDENCE OF LASER INTENSITY BREAKDOWN THRESHOLD HAVE BEEN DETERMINED. THE ELECTRON DENSITY AND TEMPERATURE MEASUREMENTS REPRESENT A MAJOR ADDITION TO THE DATA AVAILABLE ON LASER-PRODUCED PLASMAS. (AUTHOR) (U)

AD-734 327 8/2 14/5
PURDUE RESEARCH FOUNDATION LAFAYETTE IND

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. OCT 70-SEP 71, OCT 71 266P KURTZ,MAURICE K., JR.; BALASUBRAMANIAN,N. ;MIKHAIL,EDWARD M. ;STEVENSON, WARREN H. ;
CONTRACT: DAAK02-69-C-0563
PROJ. DA-4-A-061102-B-52-C
MONITOR: ETL CR-71-17

UNCLASSIFIED REPORT

DESCRIPTORS: (*PHOTOGRAMMETRY, *STEREOSCOPIC PHOTOGRAPHY), MAPPING, TERRAIN, AERIAL PHOTOGRAPHY, PHOTOGRAPHIC TECHNIQUES, PHOTOGRAPHIC IMAGES, PHOTOGRAPHIC EQUIPMENT (U)

IDENTIFIERS: *HOLOGRAPHY (U)

THE POTENTIAL USES OF OPTICAL HOLOGRAPHY IN PHOTOGRAMMETRIC MAPPING ARE IDENTIFIED. TECHNIQUES ARE GIVEN FOR PRESENTING INFORMATION WHICH HAS BEEN QUANTITATIVELY EXTRACTED BY MAPPING HOLOGRAPHIC VIRTUAL IMAGES OF REALISTIC OBJECTS AND TERRAIN. DURING MEASUREMENT, WITH A SELF-ILLUMINATED MEASURING MARK, IT WAS FOUND THAT THE POSITION ACCURACY VARIES INVERSELY WITH MAGNIFICATION AND DIRECTLY AS THE SQUARE OF THE VIEWING DISTANCE TO THE IMAGE. BY MODIFYING THE WILD A7 AUTOGRAPH SO THAT THE HOLOGRAPHIC VIRTUAL IMAGE COULD BE ABSOLUTELY ORIENTED IT WAS POSSIBLE TO MAP THE IMAGE BOTH DIGITALLY AND BY PLOTTING DETAILED OUTLINES, PLANIMETRY, PROFILES AND CONTOURS. IT IS BELIEVED THAT THE FIRST TOPOGRAPHIC MAPS EVER MADE FROM HOLOGRAPHIC IMAGES WERE PRODUCED. (AUTHOR) (U)

AD-734 408 14/2 14/5
MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES. (U)

DESCRIPTIVE NOTE: FINAL REPT. 27 NOV 68-28 JUL 71,
DEC 71 145P VEST,C. M. ;LEITH,E. N. ;
RIBBENS,W. R. ;SWEENEY,D. W. ;VARNER,J. R. ;
REPT. NO. 24200-28-F
CONTRACT: DAAG46-69-C-0017, ARPA ORDER-1245
PROJ. ARPA-8D10

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, *STEREOSCOPIC PHOTOGRAPHY), LASERS, INTERFEROMETERS, DEFECTS(MATERIALS), SURFACE PROPERTIES, CRACKS, STRESS CORROSION, QUALITY CONTROL, SANDWICH PANELS, PROJECTILE CASES, BONDED JOINTS, ALUMINUM (U)

IDENTIFIERS: *HOLOGRAPHY, *INTERFEROMETRIC HOLOGRAPHY (U)

THE FINAL TECHNICAL REPORT ON HOLOGRAPHIC TESTING RESEARCH INCLUDES A NUMBER OF SPECIFIC INVESTIGATIONS CONDUCTED AT THE RADAR AND OPTICS DIVISION OF WILLOW RUN LABORATORIES AND AT COOLEY ELECTRONICS LABORATORY OF THE UNIVERSITY OF MICHIGAN. THE INVESTIGATIONS DESCRIBED INCLUDE THE FOLLOWING: (1) INTERFEROMETRIC DETECTION OF MICROCRACKS; (2) DETECTION OF DEBONDS IN HONEYCOMB SANDWICH STRUCTURES, (3) REAL-TIME MONITORING OF STRESS-CORROSION CRACKING, (4) INTERFEROMETRY OF THREE-DIMENSIONAL, REFRACTIVE-INDEX FIELDS, (5) MEASUREMENT OF VIBRATIONAL AMPLITUDES, (6) HOLOGRAPHIC CONTOURING, (7) OPTICAL DETERMINATION OF RMS SURFACE ROUGHNESS, AND (8) NON-DESTRUCTIVE INSPECTION OF SHELL CASINGS AND PROJECTILES. THE REPORT ALSO INCLUDES A BRIEF INTRODUCTORY SECTION ON HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY AND A BRIEF GLOSSARY OF TECHNICAL TERMS FOR THE BENEFIT OF READERS WHO ARE NOT ACQUAINTED WITH THIS TECHNIQUE. (AUTHOR) (U)

AD-734 693 8/7
BENDIX RESEARCH LABS SOUTHFIELD MICH

SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING. (U)

DESCRIPTIVE NOTE: SEMIANNUAL TECHNICAL REPT. 30 APR-31 OCT 71,
30 NOV 71 27P STEINBERG,RONALD F. ;
FITZPATRICK,GERALD L. ;
REPT. NO. RLD-6050
CONTRACT: H0210032, ARPA ORDER-1579
PROJ. ARPA-1F10

UNCLASSIFIED REPORT

DESCRIPTORS: (*STRUCTURAL GEOLOGY, STEREOSCOPIC DISPLAY SYSTEMS), SEISMIC WAVES, UNDERGROUND STRUCTURES, FAULTS(GEOLOGY), SITE SELECTION, FEASIBILITY STUDIES, NEVADA (U)

IDENTIFIERS: ACOUSTIC HOLOGRAPHY, *SEISMIC HOLOGRAPHY, HOLOGRAPHY (U)

THE OBJECTIVE OF THE RESEARCH PROGRAM IS TO DEFINE A PRELIMINARY UNDERGROUND VIEWING SYSTEM BASED ON ACOUSTIC HOLOGRAPHY PRINCIPLES THAT IS CAPABLE OF DETECTING AND IMAGING ANOMALIES ASSOCIATED WITH A SELECTED FIELD TEST SITE. TASKS ASSOCIATED WITH THE PROGRAM INCLUDE THE SELECTION OF A FIELD TEST SITE, A THEORETICAL ANALYSIS, A PRELIMINARY SYSTEM DESIGN SPECIFYING THE REQUIRED EQUIPMENT AND TECHNIQUES TO CARRY OUT A FIELD TEST. IN ADDITION, HOLOGRAPHIC IMAGE ENHANCEMENT TECHNIQUES CAPABLE OF RESOLVING WEAK TARGET SIGNALS IN THE PRESENCE OF STRONG UNDESIRED SIGNALS WILL BE STUDIED. IN THIS REPORT, COVERING THE WORK DURING THE FIRST SIX MONTHS OF THE PROGRAM, EMPHASIS IS GIVEN TO THE SELECTION OF A FIELD TEST SITE AND STUDIES RELATING TO WEAK SIGNAL ENHANCEMENT TECHNIQUES. (AUTHOR) (U)

AD-734 916 14/2 13/6
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

NEW POSSIBILITIES OF NON DESTRUCTIVE TESTING OF TIRES BY LASER HOLOGRAPHY. I. PRINCIPLE HOLOGRAPHY, (U)

19 OCT 71 13P SIMORDA,JOSEF I
REPT. NO. FTD-HC-23-960-71
PROJ. AF-1369

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF PLASTICKE HMOTY A KAUCUK (CZECHOSLOVAKIA) V7 N11 P330-335 1970.

DESCRIPTORS: (•TIRES, NON-DESTRUCTIVE TESTING), LASERS, TEST METHODS, QUALITY CONTROL, LIFE EXPECTANCY, INTERFEROMETERS, CZECHOSLOVAKIA (U)

IDENTIFIERS: •HOLOGRAPHY, •HOLOGRAPHIC INTERFEROMETRY, TRANSLATIONS (U)

THE PAPER DESCRIBES THE PRINCIPLE OF HOLOGRAPHY TOGETHER WITH THE APPLICATION POSSIBILITIES OF A COMBINATION OF LASER HOLOGRAPHY WITH INTERFEROMETRY AS A NEW METHOD OF NONDESTRUCTIVE TESTING IN RESEARCH, DESIGN AND CONTROL OF RUBBER PRODUCTS, ESPECIALLY OF TIRES. (U)

AD-734 977 20/9
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ELECTROHYDRODYNAMICS (EHD) RESEARCH. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1970-71,
10 DEC 71 85P BIBLARZ,OSCAR ;
REPT. NO. NPS-57ZI71121A
PROJ. A310-3108/551-A/2R021-02-001

UNCLASSIFIED REPORT

DESCRIPTORS: (*PLASMA MEDIUM, ELECTRIC FIELDS), (*PLASMA GENERATORS, ELECTRIC FIELDS), GAS FLOW, TURBULENCE, ANEMOMETERS, INTERFEROMETERS, LASERS, THESES, PROGRAMMING(COMPUTERS) (U)

IDENTIFIERS: *ELECTROHYDRODYNAMICS, *ELECTROHYDRODYNAMIC GENERATORS, INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY (U)

WORK WITH THE STEAM INJECTOR CONTINUED DURING THE PAST YEAR. THE DEFINITION OF THE SLIP PARAMETER FOR UNSTEADY FLOW HAS BEEN USED IN CONJUNCTION WITH VELOCITY PROFILES MEASURED WITH A HOT WIRE ANEMOMETER TO EVALUATE THE POTENTIAL ROLE OF EHD (OR EGD) IN ANEMOMETRY. A DIRECT MEASUREMENT OF PARTICLE SIZE (USING HOLOGRAPHIC INTERFEROMETRY) INDICATED THAT THERE ARE NO PARTICLES OF SIZE 0.0001 OR GREATER. A COMPUTER PROGRAM DESCRIBING THE EHD FLOW HAS BEEN WRITTEN. (AUTHOR) (U)

AD-735 459 17/1
NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER SAN DIEGO CALIF

VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER. (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT REPT. JAN-APR 71,
NOV 71 33P HUNT,J. T. ;BARACH,D. ;JOHNSON, C. ;
REPT. NO. NUC-TP-239
PROJ. SF11-121-301
TASK: 14063

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONAR PROJECTORS, EQUATIONS OF MOTION), MATHEMATICAL MODELS, VIBRATION, PHOTOGRAPHIC TECHNIQUES, LASERS, TRANSDUCERS (U)

IDENTIFIERS: SONAR TRANSDUCERS, AN/BQS-6, HOLOGRAPHY, FINITE ELEMENT ANALYSIS (U)

THE PURPOSE OF THE WORK IN THIS REPORT WAS TO DEVELOP A FINITE-ELEMENT MATHEMATICAL MODEL FOR THE EQUATIONS OF MOTION THAT ARE RELATED TO THE BQS-6 TRANSDUCER'S FLEXING HEAD. RESULTS SHOWED THAT HOLOGRAPHIC INTERFEROMETRY IS AN EXTREMELY SENSITIVE AND ACCURATE EXPERIMENTAL TECHNIQUE FOR MEASURING THE SMALL DISPLACEMENTS OF VIBRATING SYSTEMS AND THAT THE FINITE-ELEMENT METHOD IS AN EXCELLENT TOOL FOR THEORETICALLY PREDICTING THIS BEHAVIOR. THE FINITE-ELEMENT ANSATZ PREDICTED ALL MEASURED RESONANT FREQUENCIES WITHIN 5 PERCENT. PREDICTED MODE SHAPES COULD NOT BE DISTINGUISHED FROM THOSE MEASURED BY HOLOGRAPHIC INTERFEROMETRY. (AUTHOR) (U)

AD-736 057 14/5 20/6
WASHINGTON UNIV ST LOUIS MO DEPT OF ELECTRICAL ENGINEERING

3-D HOLOGRAM SYNTHESIS FROM 2-D PICTURES. (U)

8 SEP 71 3P SOPORI,B. L. ;CHANG,WILLIAM S. C. ;

CONTRACT: F44620-69-C-0121
PROJ. AF-9559
TASK: 955901
MONITOR: AFOSR TR-72-0196

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN APPLIED OPTICS, V10 N12 P2789-2790 DEC 71.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC IMAGES), PHOTOGRAPHIC TECHNIQUES, SYNTHESIS (U)

IDENTIFIERS: *HALOGRAMS, HOLOGRAPHY (U)

THE AUTHORS DESCRIBE ANOTHER METHOD TO SYNTHESIZE A 3-D HOLOGRAM WITH A PARALLOX OF AN OBJECT FROM A SERIES OF TRANSPARENCIES CORRESPONDING TO ITS VARIOUS VIEWS. THE HOLOGRAM CONSISTS OF SUPERPOSITIONS OF HOLOGRAMS OF SUCCESSIVE INDIVIDUAL VIEWS OF THE OBJECT. THIS METHOD CAN BE DIRECTLY EXTENDED TO THE CASE OF MAKING 3-D HOLOGRAMS FROM 2-D X-RAY PICTURES IN MEDICAL APPLICATIONS. (AUTHOR) (U)

AD-736 127 14/2
AIR FORCE SYSTEMS COMMAND WASHINGTON D C

PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME I. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 71 710P WIMER,ARTHUR G. , JR;
REPT. NO. AFSC-TR-72-002-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-736 128.

DESCRIPTORS: (*AIR FORCE RESEARCH, *SYMPOSIA), (*CHEMISTRY, SCIENTIFIC RESEARCH), (*PHYSICS, SCIENTIFIC RESEARCH), INTERFEROMETERS, GAS CHROMATOGRAPHY, TELEMETER SYSTEMS, AIRCRAFT, REAL TIME, RADAR, LASERS, DOPPLER SYSTEMS, TRACKING, HOMING DEVICES, LIGHT HOMING, AIR DROP OPERATIONS, SEMICONDUCTORS, STORAGE BATTERIES, INERTIAL GUIDANCE, PAVEMENTS, LANDING FIELDS, HEAT EXCHANGERS, UPPER ATMOSPHERE, AIR POLLUTION (U)

IDENTIFIERS: HOLOGRAPHY, CONTROLED CONFIGURE VEHICLES, CCV(CONTROLED CONFIGURE VEHICLES), CIRIS(COMPLETELY INTEGRATED REFERENCE INSTRUMENTATION SYSTEM), COMPLETELY INTEGRATED REFERENCE INSTRUMENTATION SYSTEM, AIR POLLUTION CONTROL EQUIPMENT (U)

THE REPORT IS A COMPILATION OF PAPERS PRESENTED AT THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD OCTOBER 1971. THE PAPERS DISCUSS TOPICS INCLUDING AIR POLLUTION CONTROL, GAS CHROMATOGRAPHY, LASER GUIDANCE, REAL TIME TELEMETRY, RADAR ELEVATION BIAS, DOPPLER TRACKING RECEIVERS, HOLOGRAM INTERFEROMETRY, ELECTRO-OPTICAL SEEKER SYSTEMS, ELECTROMAGNETIC ACCELERATION OF GAS, COMPLETELY INTEGRATED REFERENCE INSTRUMENTATION SYSTEM (CIRIS), RADIATIVE MODELLING OF THE ATMOSPHERE, LIGHTWEIGHT HIGH ENERGY BATTERY, AIRDROP FROM CARGO AIRCRAFT, INTERCELL PLANAR HEAT PIPE, AIRFIELD FOUNDATIONS, VAPORIZATION OF OXIDE SCALES, RADIATION EFFECTS IN SILICON SEMICONDUCTORS, INTERFACING PROBLEMS ON CCV PERFORMANCE. (U)

AD-736 128 14/2
AIR FORCE SYSTEMS COMMAND WASHINGTON D C

PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME II. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 71 718P WIMER,ARTHUR G. , JR;
REPT. NO. AFSC-TR-002-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-736 127.

DESCRIPTORS: (*AIR FORCE RESEARCH, *SYMPOSIA), (*PHYSICS, SCIENTIFIC RESEARCH), VIDEO SIGNALS, INTERFEROMETERS, CRACK PROPAGATION, GYROSCOPES, GAS LASERS, REENTRY VEHICLES, NOISE, AIRCRAFT, HEAT-RESISTANT MATERIALS, INSECTICIDES, DECONTAMINATION, OPDAR, ATMOSPHERIC MOTION, COMMUNICATION SATELLITES(ACTIVE), IMAGE CONVERTERS, INFRARED IMAGES, INTEGRATED CIRCUITS, BOMB FUZES, GUIDED MISSILES(AIR-TO-SURFACE) (U)

IDENTIFIERS: HOLOGRAPHY, METAL VAPOR LASERS, ION LASERS, LIQUID CRYSTALS, ETHANOLAMINE, REMOTE SENSING, SRAM(SHORT RANGE ATTACK MISSILES), SHORT RANGE ATTACK MISSILES (U)

THE REPORT IS A COMPILATION OF PAPERS PRESENTED AT THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD OCTOBER 1971. THE PAPERS DISCUSS TOPICS INCLUDING: GERT SIMULATION, VIDEO DATA REDUCTION, MECHANICAL IMPEDANCE TECHNIQUE, HIGH CURRENT PULSE TESTING OF MICROCIRCUITS, HOLOGRAPHIC INTERFEROMETRY, CRACK PROPAGATION TESTS IN THE F-111, GYROSCOPE CENTRIFUGE TEST, BIODYNAMIC MODEL ON SPINAL INJURIES FROM EJECTION SEATS, METAL VAPOR LASERS, DISCHARGE IN GAS LASERS, THERMOSTRUCTURAL RESPONSE OF REENTRY NOSE TIPS, NOISE LEVELS IN AIRCRAFT, NEMATIC LIQUID CRYSTALS, AIRBORNE FUZE FUNCTION INDICATORS, SHORT RANGE ATTACK MISSILE (SRAM) NAVIGATION SYSTEM, NONFLAMMABLE FIBROUS MATERIALS, ORGANOPHOSPHORUS INSECTICIDE DECONTAMINANT, LADAR CLOUD/TARGET POLARIZATION DISCRIMINATION, SHEAR-INDUCED ATMOSPHERIC TURBULENCE, X-T PLOTTER FOR IGLOO WHITE, MILITARY COMMUNICATIONS SATELLITES, INFRARED IMAGE CONVERTERS,

AD-736 641 7/4
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

HOLOGRAM INTERFEROMETRY FOR ISOTHERMAL DIFFUSION MEASUREMENTS. (U)

DESCRIPTIVE NOTE: JOURNAL ARTICLE,
18 MAR 71 7P BECSEY,JULIUS G. ;JACKSON, NATHANIEL R. ;BIERLEIN,JAMES A. ;
REPT. NO. ARL-71-0316
PROJ. AF-7023
TASK: 702300

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF PHYSICAL CHEMISTRY, V75 N21 P3374-3376 1971.

DESCRIPTORS: (*DIFFUSION, *INTERFEROMETERS), (*SOLUTIONS, DIFFUSION), THERMODYNAMICS, CONCENTRATION(CHEMISTRY), OPTICAL PROPERTIES (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY (U)

THE USE OF HOLOGRAM INTERFEROMETRY FOR THE STUDY OF ISOTHERMAL DIFFUSION FROM A BOUNDARY IS REPORTED. THE PRINCIPAL ADVANTAGE OF THE METHOD, ASIDE FROM THE SIMPLICITY OF THE OPTICS, IS THAT THERE IS NO NEED FOR OPTICAL-QUALITY WINDOWS IN THE DIFFUSION CELL. SINCE THE BASE HOLOGRAM CAN BE TAKEN WITH THE CELL FILLED WITH A HOMOGENEOUS SOLUTION, THE REAL-TIME INTERFEROGRAM IS FORMED BETWEEN THE RECONSTRUCTED HOMOGENEOUS CELL IMAGE AND THE CELL IMAGE WITH THE DIFFUSION IN PROGRESS. THUS, ALL CONTRIBUTIONS DUE TO OPTICAL RETARDATION IN THE TEST ZONE ARE NULLED OUT EXCEPT THOSE PRODUCED BY THE DIFFUSION PROCESS. (AUTHOR) (U)

AD-736 926 14/5
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
JAN 72 25P RODEMANN,ALFRED H. ;BREGLIA,
DENIS R. ;MOHON,WINDELL N. ;
REPT. NO. NAVTRADEVCEN-TN-20
PROJ. NAVTRADEVCEN-1717

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, REVIEWS), PHOTOGRAPHIC TECHNIQUES, LASERS, PHOTOGRAPHIC EQUIPMENT (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE (U)

A THOROUGH SURVEY IS PRESENTED OF THE RALATIVELY NEW SCIENCE OF HOLOGRAPHY. THE SURVEY INCLUDES A SOMEWHAT EXTENSIVE SYNOPSIS OF THE HISTORICAL BACKGROUND OF THE SUBJECT. A CLEAR AND CONCISE DESCRIPTION IS GIVEN OF THE PHYSICAL ASPECTS OF HOLOGRAPHY INCLUDING AN ANALOGY TO PHOTOGRAPHY. A MATHEMATICAL ANALYSIS IS GIVEN OF OFF-AXIS TYPE HOLOGRAMS. EXPERIMENTAL APPARATUS IS DISCUSSED AND PHOTOGRAPHS SHOW ACTUAL LABORATORY SETUPS. THE REQUIRED COHERENCE LENGTH OF A LASER IS MENTIONED. METHODS OF IMAGE RECONSTRUCTION ARE ILLUSTRATED. SEVERAL EXAMPLES OF APPLICATIONS ARE LISTED ALONG WITH METHODS OF DEPLOYMENT. ONE METHOD OF MAKING 360 DEGREE HOLOGRAMS IS INTRODUCED. A BIBLIOGRAPHY IS GIVEN OF THE MOST RECENT TEXT BOOKS AVAILABLE ON THE SUBJECT. (AUTHOR) (U)

AD-737 182 9/2
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J

CHARACTER IDENTIFICATION BY HOLOGRAPHY AND COHERENT SPATIAL FILTERING. (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT TECHNICAL REPT.,
OCT 71 29P CONSTANTINOU,GEORGE ;
REPT. NO. ECOM-3494
PROJ. DA-1-H-662701-A-484
TASK: 1-H-662701-A-48407

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING SYSTEMS, CHARACTER RECOGNITION), (*CHARACTER RECOGNITION, STEREOSCOPIC PHOTOGRAPHY), PATTERN RECOGNITION, INPUT-OUTPUT DEVICES, OPTICAL FILTERS, INFORMATION THEORY, LASERS (U)

IDENTIFIERS: *OPTICAL DATA PROCESSING, *HOLOGRAPHIC INFORMATION STORAGE, HOLOGRAPHY (U)

TECHNIQUES OF COHERENT SPATIAL FILTERING FOR CHARACTER READING ARE EXAMINED. FOURIER HOLOGRAMS ARE USED AS FILTERS. METHODS FOR IMPROVING CHARACTER SELECTIVITY ARE INVESTIGATED. THE PRACTICAL CONSIDERATIONS FOR APPLYING THESE TECHNIQUES ARE DISCUSSED AND THE ADVANTAGES OF A COHERENT OPTICAL CHARACTER READER OVER A CONVENTIONAL ONE ARE LISTED. (AUTHOR) (U)

AD-737 390 8/7
WISCONSIN UNIV MILWAUKEE DEPT OF GEOLOGICAL SCIENCES

DEVELOPMENT OF CAPABILITIES OF OPTICAL DIFFRACTION ANALYSIS FOR QUANTITATIVELY COMPARING AND CORRELATING ROCK FABRICS AND FABRIC CHANGES. (U)

DESCRIPTIVE NOTE: ANNAUL TECHNICAL REPT. NO. 1, 11 JAN 71-10 JAN 72.
10 FEB 72 88P PINCUS,HOWARD J. ;
CONTRACT: H0210003, ARPA ORDER-1579
PROJ. ARPA-1F10

UNCLASSIFIED REPORT

DESCRIPTORS: (*ROCK(GEOLOGY), DEFORMATION), MECHANICAL PROPERTIES, TEST EQUIPMENT, TEST METHODS, DIFFRACTION ANALYSIS, PHOTOGRAPHIC TECHNIQUES, OPTICAL PROPERTIES, QUANTITATIVE ANALYSIS, CORRELATION TECHNIQUES (U)

IDENTIFIERS: *ROCK MECHANICS, HOLOGRAPHY (U)

PHOTOGRAPHS AND ACETATE PEELS OF ROCK SPECIMENS UNDERGOING DEFORMATION HAVE BEEN CONVERTED TO THEIR TWO-DIMENSIONAL FOURIER AMPLITUDE TRANSFORMS BY OPTICAL DIFFRACTION. CHANGES IN THE TRANSFORMS REFLECT SPATIAL CHANGES IN THE ROCK FABRICS. MAPS OF THE TRANSFORMS ASSIST IN THEIR INTERPRETATION. TRANSFORMS HAVE ALSO BEEN PRODUCED USING PARTIALLY COHERENT LIGHT AND A MODIFIED MISCROSCOPE SYSTEM. SUITES OF SPATIAL FILTERS PRODUCED FROM THEORETICAL CONSIDERATIONS AND MODIFIED TRANSFORMS HAVE BEEN CONSTRUCTED FOR DIFFERENTIAL ANALYSIS OF THE SPATIAL FREQUENCY CONTENT OF INPUT PHOTOGRAPHS, HOLOGRAPHIC SUBTRACTION OF ONE TEST INPUT FROM ANOTHER HAS BEEN STARTED, LAYING THE FOUNDATION FOR ANOTHER APPROACH TO MAPPING FABRIC CHANGES IN PROGRESSIVE DEFORMATION. (AUTHOR) (U)

AD-737 521 20/5 20/6 14/5
CALIFORNIA INST OF TECH PASADENA DIV OF ENGINEERING AND APPLIED SCIENCE

MODERN OPTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1968-1971,
FEB 72 25P GEORGE,NICHOLAS ;MACANALLY, RICHARD B. ;
CONTRACT: AF-AFOSR-1492-68
PROJ. AF-9768
TASK: 976802
MONITOR: AFOSR TR-72-0372

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED AUG 70, AD-717 775.

DESCRIPTORS: (*LASERS, *STEREOSCOPIC PHOTOGRAPHY), (*COHERENT RADIATION, NONLINEAR SYSTEMS), SCIENTIFIC RESEARCH, REVIEWS, ABSTRACTS, OPDAR, AIR POLLUTION, MATCHED FILTERS, ELECTROOPTICS, OPTICAL MATERIALS, PHOTOGRAPHIC TECHNIQUES (U)

IDENTIFIERS: *HOLOGRAPHY, NONLINEAR OPTICS, HOLOGRAMS, LIQUID CRYSTALS, HELIUM NEON LASERS (U)

THEORETICAL AND EXPERIMENTAL RESEARCH IS BEING CONDUCTED IN THE FIELD OF MODERN OPTICS. THE GOAL IS TO CONTRIBUTE SOLUTIONS FOR IMPORTANT SPECIFIC PROBLEMS IN THE GENERATION, PROPAGATION, PROPERTIES, AND USES OF COHERENT ELECTROMAGNETIC RADIATION. RESEARCH ACTIVITIES UNDER AFOSR SPONSORSHIP ARE SUMMARIZED IN THIS FINAL REPORT FOR THE PERIOD FROM 1968 THROUGH 1971. SUBJECTS OF RESEARCH INTEREST HAVE BEEN GROUPED INTO TWO MAIN AREAS: (1) HOLOGRAPHY AND OPTICAL DATA PROCESSING AND (2) NONLINEAR OPTICS. SPECIFIC TOPICS IN HOLOGRAPHY AND OPTICAL DATA PROCESSING HAVE INCLUDED HOLOGRAPHIC STEREOGRAMS, BLURRED IMAGE RESTORATION, REAL TIME RECORDING, AND MATCHED FILTERING. IN NONLINEAR OPTICS AND LASERS THE STUDIES INCLUDE THE ORIGIN OF THE NONLINEAR REFRACTIVE INDEX, INFRARED ABSORPTION AND FLUORESCENCE, AND SATURATION PHENOMENA IN MAGNETICALLY TUNED LASER AMPLIFIERS. (AUTHOR) (U)

AD-738 050 8/7
TRW SYSTEMS GROUP REDONDO BEACH CALIF ADVANCED TECHNOLOGY STAFF GROUP

EXPERIMENTAL INVESTIGATION OF FRACTURE OF GRANITE UNDER COMPRESSION. (U)

DESCRIPTIVE NOTE: FINAL REPT. 10 MAR-20 DEC 71, 15 DEC 71 79P APRAHAMIAN,ROBERT ;O'KEEFE,JOHN D. ;OVEROYE,KENNETH R. ;
CONTRACT: H0110376, ARPA ORDER-1579
PROJ. ARPA-1F10

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRANITE, FRACTURE(MECHANICS)), LASERS, PHOTOGRAPHIC TECHNIQUES, ROCK(GEOLOGY), STRESSES, INTERFEROMETERS (U)

IDENTIFIERS: QUARTZITES, *HOLOGRAPHY, *ROCK MECHANICS, *INTERFEROMETRIC HOLOGRAPHY, COMPUTER AIDED ANALYSIS (U)

THE APPLICABILITY OF LASER HOLOGRAPHIC INTERFEROMETRY TO STUDY THE DEFORMATIONS OF GEOLOGIC MATERIALS UNDER APPLIED STRESSES WAS INVESTIGATED. TWO TYPES OF GEOLOGIC MATERIALS WERE STUDIED - JASPER QUARTZITE AND CHARCOAL GRANITE. TWO HOLOGRAPHIC INTERFEROMETRY TECHNIQUES WERE EMPLOYED. DOUBLE EXPOSURE HOLOGRAPHIC INTERFEROMETRY WAS USED TO STUDY AND RECORD THE DEFLECTIONS OF THE SPECIMENS FROM 0 PSI TO NEAR-FRACTURE. DATA FROM THE DOUBLE EXPOSURE HOLOGRAMS PROVIDED RADIAL AND AXIAL DISPLACEMENTS ALONG THE LENGTH OF THE SPECIMENS. A COMPUTER PROGRAM WAS UTILIZED TO DEDUCE THE RADIAL AND AXIAL STRAINS FROM THE HOLOGRAPHIC DATA. STORED BEAM HOLOGRAPHIC INTERFEROMETRY WAS USED TOGETHER WITH HIGH SPEED MOTION PICTURE PHOTOGRAPHY TO RECORD THE DEFLECTIONS OF THE SPECIMENS FROM NEAR-FRACTURE TO FRACTURE. (AUTHOR) (U)

AD-738 820 20/4 14/2
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA MD

HOLOGRAPHIC DISPLACEMENT MEASUREMENTS ON A HIGHLY SKEWED PROPELLER BLADE, (U)

AUG 71 23P DHIR,SURENDRA K. ;SIKORA,JEROME P. ;

REPT. NO. NSRDC-3680
PROJ. ZR011-01-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*PROPELLER BLADES, HYDRODYNAMIC CONFIGURATIONS), PROPELLERS(MARINE), INTERFEROMETERS, PRESSURE, TEST FACILITIES, LOADING(MECHANICS), RESPONSE, MECHANICAL PROPERTIES, MARINE ENGINEERING, LASERS, OPTICAL ANALYSIS, NON-DESTRUCTIVE TESTING (U)

IDENTIFIERS: *HOLOGRAPHY, SKEWED PROPELLERS, PRESSURE CHAMBERS, *INTERFEROMETRIC HOLOGRAPHY, INTERFERENCE FRINGES (U)

STATIC DEFLECTIONS WERE MEASURED ON A HIGHLY SKEWED MARINE PROPELLER BLADE MODEL USING HOLOGRAPHIC INTERFEROMETRY. A SPECIALLY DESIGNED PRESSURE CHAMBER WAS USED TO LOAD THE BLADE MODEL UNDER UNIFORM AIR PRESSURE FROM ONE SIDE. THE METHOD THAT WAS USED TO PREDICT THE THREE-DIMENSIONAL DISPLACEMENTS FROM THE HOLOGRAPHIC FRINGES IS DEVELOPED AND DESCRIBED. THE HOLOGRAPHIC DISPLACEMENT RESULTS WERE STUDIED FOR FAVORABLE CORRELATION WITH THOSE FROM A FINITE ELEMENT ANALYSIS. (U)

AD-740 228 17/9
MOORE SCHOOL OF ELECTRICAL ENGINEERING PHILADELPHIA PA

PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
NOV 71 271P FARHAT,NABIL H. ;BORDOGNA,J. ;
GOUD,R. ;GUARD,W. R. ;JASTRZEMBSKI,J. ;
REPT. NO. 72-10
CONTRACT: DA-28-043-AMC-02411(E)
PROJ. DA-1-H-162202-A-219
MONITOR: ECOM 02411-25

UNCLASSIFIED REPORT

DESCRIPTORS: (*RADAR SIGNALS, IMAGE CONVERTERS), (*RADAR IMAGES, STEREOSCOPIC DISPLAY SYSTEMS), (*RADAR EQUIPMENT, AIRBORNE), (*MILLIMETER WAVES, IMAGE CONVERTERS), COHERENT RADIATION, OPTICAL IMAGES, TARGET RECOGNITION, RADAR TARGETS, SIGNAL-TO-NOISE RATIO, FOURIER ANALYSIS, LANDING AIDS, HELICOPTERS (U)

IDENTIFIERS: HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE, AVIONICS (U)

THE RESULTS OF AN EXTENSIVE STUDY OF MILLIMETER WAVE IMAGE CONVERSION AND HOLOGRAPHY ARE PRESENTED. EXPERIMENTS SUPPORTED BY THEORY AND PRACTICAL CONSIDERATIONS SHOW THAT THE HOLOGRAPHIC APPROACH TO MILLIMETER WAVE COHERENT IMAGING, DESPITE ITS RELATIVE COMPLEXITY, IS SUPERIOR TO THE DIRECT IMAGING APPROACH BASED ON THE IMAGING PROPERTIES OF MILLIMETER WAVE LENSES OR OTHER OPTICS. IN PARTICULAR THE RESULTS OBTAINED WITH A HOLOGRAPHIC IMAGING SYSTEM EMPLOYING SYNCHRONOUS DETECTION IN CONJUNCTION WITH AN ELECTRONICALLY SYNTHESIZED REFERENCE (ESR) TO OBTAIN A MAPPING OF THE PHASE DISTRIBUTION OF THE OBJECT WAVEFRONT OVER THE HOLOGRAM RECORDING APERTURE ARE QUITE ENCOURAGING. (AUTHOR) (U)

AD-740 836 17/1 20/5
BENDIX RESEARCH LABS SOUTHFIELD MICH

UNDERWATER VIEWING SYSTEM USING SOUND HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 68-31 JAN 72,
APR 72 76P KEATING,P. N. ;KOPPELMANN,R. ; STEINBERG,R. F. ;
REPT. NO. RLD-6140
CONTRACT: N00014-68-C-0338
PROJ. NR-261-170

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ALSO INCLUDES ENVELOPE OF PHOTOS.

DESCRIPTORS: (*SONAR EQUIPMENT, STEREOSCOPIC DISPLAY SYSTEMS), (*UNDERWATER SOUND, OPTICAL IMAGES), (*STEREOSCOPIC DISPLAY SYSTEMS, *LASERS), UNDERWATER SOUND EQUIPMENT, ELECTRONIC EQUIPMENT, POTASSIUM COMPOUNDS, PHOSPHATES, DEUTERATED COMPOUNDS, MODULATORS, TEST METHODS, TARGET RECOGNITION, PHOTOGRAPHS (U)

IDENTIFIERS: *HOLOGRAPHY, *ACOUSTIC HOLOGRAPHY, SIGNAL PROCESSING, POTASSIUM DIHYDROPHOSPHATES, OPTICAL MODULATORS (U)

A FEASIBILITY STUDY AND PROTOTYPE SYSTEM DEVELOPMENT FOR AN UNDERWATER VIEWING SYSTEM BASED ON ACOUSTIC HOLOGRAPHIC PRINCIPLES WAS INITIATED. THE OBJECTIVE WAS TO STUDY VARIOUS RECEIVING ARRAY CONFIGURATIONS AND CONSTRUCT A MODULAR PROTOTYPE SYSTEM TO EVALUATE THE CAPABILITIES OF HOLOGRAPHIC CONCEPTS. IN PARALLEL, THE DEVELOPMENT OF A SYSTEM FOR REAL-TIME OPTICAL RECONSTRUCTION OF SAMPLED HOLOGRAMS WAS INITIATED. THE REPORT PRESENTS A SUMMARY OF THE PROGRAM ACTIVITIES FROM ITS INCEPTION IN 1968 TO ITS COMPLETION IN 1971. ACCOMPLISHMENTS INCLUDE COMPLETION OF THE DESIGN AND CONSTRUCTION OF THE UNDERWATER VIEWING SYSTEM AS WELL AS THAT FOR THE COHERENT LIGHT AREA MODULATOR. EXPERIMENTAL VERIFICATION OF THE SYSTEM'S OPERATIONAL CAPABILITIES WAS ALSO COMPLETED. THIS INCLUDES THE GENERATION OF HOLOGRAMS USING THE UNDERWATER VIEWING SYSTEM AND VARIOUS TARGET CONFIGURATIONS, AND THE RECONSTRUCTION OF THESE HOLOGRAMS USING THE COHERENT LIGHT AREA MODULATOR. (AUTHOR) (U)

AD-741 067 20/4 14/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF THE FLOW FIELD AROUND A RIGHT CIRCULAR CONE AT ANGLE OF ATTACK. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
DEC 71 156P COLLINS,DANIEL J. ;JAGOTA,RAVI C. ;
REPT. NO. NPS-57CO71111A
PROJ. A310-310A/551-A/1R010-03-01

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES REPORT DATED DEC 70, AD-721 543.

DESCRIPTORS: (*FLOW VISUALIZATION, *STEREOSCOPIC PHOTOGRAPHY), (*CONICAL BODIES, FLOW FIELDS), ANGLE OF ATTACK, INTERFEROMETERS, SHOCK WAVES, PROGRAMMING(COMPUTERS), EQUATIONS OF MOTION, THESES (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY (U)

THE SUCCESSFUL APPLICATION OF HOLOGRAPHY TO THE STUDY OF THREE DIMENSIONAL FLOW FIELDS DUE TO PHASE OBJECTS HAS BEEN REPORTED IN THE LITERATURE. THE PRESENT REPORT EXTENDS THIS TECHNIQUE TO THE STUDY OF DENSITY FIELDS AROUND OPAQUE BODIES AS WOULD NORMALLY BE ENCOUNTERED IN WIND TUNNEL EXPERIMENTS. THE DENSITY FIELD AROUND A 10 DEGREE HALF-ANGLE CONE AT ZERO AND TEN DEGREE ANGLE OF ATTACK HAS BEEN INVESTIGATED BY MEANS OF THE FINITE FRINGE HOLOGRAPHIC INTERFEROMETRY. THE THREE DIMENSIONAL DENSITY FIELD OBTAINED FROM THE REDUCTION OF THE INTERFEROGRAMS WAS FOUND TO AGREE WITH THAT OBTAINED FROM AN ANALYTICAL SOLUTION OF THE GOVERNING EQUATIONS. (U)

AD-742 074 9/3
OFFICE OF NAVAL RESEARCH ARLINGTON VA

ELECTRONICS TECHNOLOGY IN JAPAN, (U)

18 APR 72 27P FROMAN,JAY ;
REPT. NO. ONR-31

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONICS, *JAPAN), ELECTRONIC EQUIPMENT, INDUSTRIES, INFRARED DETECTORS, CHARACTER RECOGNITION, ULTRASONIC RADIATION, SUPERCONDUCTORS, DATA STORAGE SYSTEMS, LIGHT COMMUNICATION SYSTEMS, LASERS, SEMICONDUCTORS, FERROELECTRIC CRYSTALS (U)

IDENTIFIERS: SIGNAL PROCESSING, LIQUID CRYSTALS, GUNN DIODES, AMORPHOUS SEMICONDUCTORS, CHEMICAL VAPORDEPOSITION, HOLOGRAPHY (U)

THE REPORT COVERS A BRIEF LIAISON VISIT TO JAPANESE INDUSTRIAL LABORATORIES TO OBTAIN A BROAD COVERAGE OF RECENT PROGRESS IN FIELDS SUCH AS MICROWAVES, ELECTRON PHYSICS, COMPUTER COMPONENTS, SEMICONDUCTORS, AND ELECTRON DEVICES IN GENERAL. (AUTHOR) (U)

AD-742 349 20/6
STANFORD UNIV CALIF STANFORD ELECTRONICS LABS

INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
MAR 72 46P GOODMAN,J. W. ;STRUEBIN,H. B. ;
REPT. NO. SU-SEL-72-006, TR-6418-1
CONTRACT: N00014-67-A-0112-0044, N00014-67-A-0112-0023
PROJ. SU-6418

UNCLASSIFIED REPORT

DESCRIPTORS: (*OPTICAL FILTERS, PERFORMANCE(ENGINEERING)), MATHEMATICAL MODELS, OPTICAL PROPERTIES, COHERENT RADIATION, DATA PROCESSING SYSTEMS, TRANSFER FUNCTIONS (U)

IDENTIFIERS: HOLOGRAPHY (U)

THE AUTHORS REPORT ON A NEW METHOD FOR INCREASING THE LINEAR DYNAMIC RANGE OF COHERENT OPTICAL SPATIAL FILTERS, WITH SPECIAL REFERENCE TO HOLOGRAPHIC IMAGE DEBLURRING FILTERS. THEORY, COMPUTER SIMULATIONS AND EXPERIMENTAL RESULTS ARE PRESENTED. (AUTHOR) (U)

AD-742 619 20/4 14/5 20/5
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT PARIS (FRANCE)

LASER TECHNOLOGY IN AERODYNAMIC MEASUREMENTS. (U)

DESCRIPTIVE NOTE: LECTURE SERIES,
MAR 72 256P PANKHURST,R. C. ;
REPT. NO. AGARD-LS-49

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. PRESENTED AT VON KARMON INST. FOR FLUID DYNAMICS, 14-18 JUN 71.

DESCRIPTORS: (*AERODYNAMICS, *SYMPOSIA), (*LASERS, AERODYNAMICS), COHERENT RADIATION, FLOW VISUALIZATION, FLOW FIELDS, HIGH-SPEED PHOTOGRAPHY, MEASUREMENT, WIND TUNNELS (U)

IDENTIFIERS: *HOLOGRAPHY (U)

;CONTENTS: AN INTRODUCTION TO THE LASER; PRINCIPLES OF HOLOGRAPHY; MATHEMATICAL METHODS IN COHERENT OPTICAL SYSTEMS ANALYSIS; EFFECTS OF COHERENCE ON FLOW VISUALIZATION METHODS; AERODYNAMIC HOLOGRAPHY; EXPERIMENTAL HOLOGRAPHY; CHARACTERISTICS OF DIELECTRIC HOLOGRAMS; APPLICATIONS OF PULSED LASER HOLOGRAPHY; LASER BEAM PROBING FOR AERODYNAMIC FLOW FIELD ANALYSIS; THE LASER IN HIGH SPEED PHOTOGRAPHY; LASER METROLOGY; APPLICATION OF DUEL SCATTER LASER DOPPLER VELOCIMETERS FOR WIND TUNNEL MEASUREMENTS. (U)

AD-742 710 14/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

SOME NEW APPLICATIONAL POSSIBILITIES OF HOLOGRAPH. (U)

1 MAR 72 17P REICHMANN,S. ;
REPT. NO. FTD-HT-23-1288-71

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF MILITAERTECHNIK (EAST GERMANY) N6 P249-252 1970, BY J. STOCK.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, REVIEWS), DATA STORAGE SYSTEMS, PHOTOGRAPHIC FILM, STEREOSCOPIC DISPLAY SYSTEMS, TELEVISION DISPLAY SYSTEMS, MICROSCOPES, HIGH-SPEED CAMERAS, RADAR EQUIPMENT, EAST GERMANY (U)

IDENTIFIERS: *HOLOGRAPHY, TRANSLATIONS, HOLOGRAPHIC INFORMATION STORAGE, MICROWAVE HOLOGRAPHY (U)

THE REPORT DISCUSSES POSSIBLE APPLICATIONS OF HOLOGRAPHY IN THE FOLLOWING AREAS: HOLOGRAPHIC MASS STORAGE; HOLOGRAPHIC FILM RECORDING; HOLOGRAPHIC TELEVISION; HOLOGRAPHIC X-RAY MICROSCOPE; HOLOGRAPHIC SUPERSONIC CAMERA; HIGH FREQUENCY HOLOGRAPHY; SLANT SIGHT RADAR HOLOGRAPHY. (U)

AD-743 098 20/5
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA JASON DIV

REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS, (U)

AUG 71 34P WATSON,KENNETH ;CASE,KENNETH ; DASHEN,ROGER ;KROLL,NORMAL ;RUDERMAN,MALVIN ;
REPT. NO. S-391-1
CONTRACT: DAHC15-67-C-0011
MONITOR: IDA/HQ 71-13167-1

UNCLASSIFIED REPORT

DESCRIPTORS: (*LASERS, SCIENTIFIC RESEARCH), SAFETY, MEDICAL RESEARCH, RADIOBIOLOGY, CHEMICAL INDUSTRY, THERMONUCLEAR REACTIONS, LIGHT COMMUNICATION SYSTEMS, AIR POLLUTION, LABORATORY EQUIPMENT, GEOPHYSICS, STEREOSCOPIC PHOTOGRAPHY, METEOROLOGICAL INSTRUMENTS, DATA STORAGE SYSTEMS, MANUFACTURING METHODS, SPECTROSCOPY, ASTROPHYSICS, REVIEWS, SYMPOSIA (U)

IDENTIFIERS: LASER RADIOBIOLOGY, LASER RADIATION PROTECTION, HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE, LASER INTERFEROMETERS, LASER SPECTROSCOPY (U)

ALL POTENTIAL USES OF LASERS, CIVIL AND MILITARY, ARE REVIEWED: MEDICINE AND BIOLOGICAL RESEARCH, CHEMICAL PROCESSING, INITIATION OF CONTROLLED THERMONUCLEAR REACTIONS, COMMUNICATIONS, POLLUTANT DETECTION AND MONITORING, GEOSCIENCE APPLICATIONS, HOLOGRAPHIC APPLICATIONS, MANUFACTURING AND RELATED PROCESSES, AND BASIC RESEARCH. RECOMMENDATIONS ARE MADE CONCERNING FEDERAL ENCOURAGEMENT, FUNDING, AND COORDINATION OF FURTHER EFFORT IN THESE AREA AND IN LASER TECHNOLOGY AND DEVICE DEVELOPMENT. (AUTHOR) (U)

AD-743 310 7/4 14/2
AIR FORCE AERO PROPULSION LAB WRIGHT-PATTERSON AFB OHIO

DETERMINATION OF SILVER PERCHLORATE DIFFUSION COEFFICIENT BY HOLOGRAPHIC INTERFEROMETRY. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
MAR 72 52P KERR,ROBERT L. ;
REPT. NO. AFAPL-TR-71-27
PROJ. AF-3145
TASK: 314522

UNCLASSIFIED REPORT

DESCRIPTORS: (*SILVER COMPOUNDS, DIFFUSION), (*ELECTROLYTES, *DIFFUSION), (*ELECTROCHEMISTRY, DIFFUSION), INTERFEROMETERS, COHERENT RADIATION, HEAT OF ACTIVATION, BATTERIES + COMPONENTS, ELECTROLYTIC CELLS, SOLUTIONS, CONCENTRATION(CHEMISTRY), STEREOSCOPIC PHOTOGRAPHY (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY, *SILVER PERCHLORATES, SILVER CELLS, BATTERY ELECTROLYTES (U)

HOLOGRAPHIC INTERFEROMETRY WAS USED TO FIND CONCENTRATION GRADIENTS IN THE ELECTROLYTE OF A SILVER-SILVER PERCHLORATE-SILVER ELECTROCHEMICAL CELL. THESE GRADIENTS WERE THEN USED AS THE BASIS FOR CALCULATION OF THE DIFFUSION COEFFICIENT AND THE ACTIVATION ENERGY FOR SILVER IN SILVER PERCHLORATE. BASED ON AN ARRHENIUS PLOT OF THESE VALUES, THE ACTIVATION ENERGY REQUIRED FOR DIFFUSION WAS FOUND. THE OBJECT OF THE WORK DESCRIBED WAS TO DETERMINE THE APPLICABILITY OF ELECTROCHEMICAL HOLOGRAPHIC INTERFEROMETRY TO BATTERY RESEARCH. THE LIMITATIONS ON THE PROCEDURE WERE EVALUATED AND IT WAS CONCLUDED THAT THE METHOD COULD BE USED TO DETERMINE DIFFUSION COEFFICIENTS AT ELECTROLYTE CONCENTRATIONS OF LESS THAN 1 MOLAR AND WITH CURRENTS OF LESS THAN 5 MA/SQ CM. IT WAS DETERMINED THAT THE METHOD CAN BE USED AS AN EARLY SCREENING PROCEDURE TO EVALUATE NEW ELECTROLYTES SUCH AS THOSE INTENDED FOR USE IN LITHIUM BATTERIES WHERE CONCENTRATIONS ARE CHARACTERISTICALLY LOW. (AUTHOR) (U)

AD-743 777 14/5
LAVAL UNIV QUEBEC LABORATOIRE D'OPTIQUE ET HYPERFREQUENCES

RANDOM BIAS HOLOGRAMS, (U)

18 OCT 71 9P ARSENAULT, H. H. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN OPTICS COMMUNICATIONS, V4 N4 P267-270 DEC 71.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC TECHNIQUES), LASERS, DIFFUSERS, PHOTOGRAPHIC IMAGES, CANADA (U)

IDENTIFIERS: *HOLOGRAPHY (U)

TO MAKE HOLOGRAMS OF THREE-DIMENSIONAL DIFFUSE OBJECTS, THE CONVENTIONAL TECHNIQUE CONSISTS OF ILLUMINATING THE PHOTOGRAPHIC PLATE WITH A UNIFORM REFERENCE BEAM THAT IS MODULATED BY THE LIGHT REFLECTED FROM THE OBJECT. THIS SET-UP REQUIRES A NUMBER OF BEAM SPLITTERS, BEAM EXPANDERS, PINHOLE FILTERS AND MIRRORS. IF INSTEAD OF A UNIFORM REFERENCE BEAM, A REFERENCE BEAM HAVING LARGE RANDOM VARIATIONS OF AMPLITUDE FROM POINT TO POINT IS USED, IT IS STILL POSSIBLE UNDER CERTAIN CONDITIONS TO RECONSTRUCT THE OBJECT FROM THE HOLOGRAM. A METHOD IS DESCRIBED FOR MAKING HOLOGRAMS OF THREE-DIMENSIONAL OBJECTS USING ONLY A LASER, ONE MIRROR, ONE DIFFUSER, AND A PHOTOGRAPHIC PLATE. SUCH HOLOGRAMS MAY BE RECONSTRUCTED WITH A POINT SOURCE IN THE USUAL MANNER, AND THE QUALITY OF THE IMAGE IS COMPARABLE TO THAT FROM ORDINARY HOLOGRAMS. (AUTHOR) (U)

AD-743 991 14/4 14/2
NATIONAL MATERIALS ADVISORY BOARD (NAS-NAE)
WASHINGTON D C

TESTING FOR PREDICTION OF MATERIAL PERFORMANCE IN COMPONENTS AND STRUCTURES. (U)

DESCRIPTIVE NOTE: FINAL REPT.
MAY 72 139P
REPT. NO. NMAB-288
CONTRACT: DA-49-083-OSA-3131

UNCLASSIFIED REPORT

DESCRIPTORS: (*RELIABILITY, TEST METHODS), NON-DESTRUCTIVE TESTING, PREDICTIONS, CORROSION, FATIGUE(MECHANICS), LIFE EXPECTANCY, ELECTRIC INSULATION, ALLOYS, ABSTRACTS, REPORTS (U)

IDENTIFIERS: LIFE TESTS, HOLOGRAPHY (U)

A SURVEY HAS BEEN MADE OF PROBLEMS OF TESTING MATERIALS TO PREDICT THEIR PERFORMANCE IN COMPONENTS AND STRUCTURES. THE VIEWPOINT IS THAT OF THE DESIGNER AND THOSE WHOM HE SERVES. THE REPORT DISCUSSES THE ROLE OF TESTING IN ARRIVING AT DESIGN DECISIONS. THE REPORT GIVES CHECKLISTS AND OTHER PRACTICAL HINTS FOR DECIDING WHEN TO TEST AND WHEN TESTING COULD BE SUPERFLUOUS. APPENDICES FURNISH USEFUL REFERENCE AND INSTRUCTIONAL MATERIAL. (AUTHOR) (U)

AD-744 072 14/2 17/9
GENERAL DYNAMICS SAN DIEGO CALIF ELECTRO DYNAMIC DIV

MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS. (U)

DESCRIPTIVE NOTE: FINAL REPT. JAN 71-MAR 72,
MAR 72 82P ROPE,E. L. ;HAYWARD,R. A. ;
TRICOLES,G. ;
REPT. NO. R-71-016-4
CONTRACT: N00019-71-C-0065

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, STEREOSCOPIC PHOTOGRAPHY), (*RADOMES, NON-DESTRUCTIVE TESTING), TEST METHODS, MICROWAVES, ANTENNA APERTURES, SPECTRUM ANALYZERS (U)

IDENTIFIERS: *MICROWAVE HOLOGRAPHY, HOLOGRAPHY (U)

THE REPORT DESCRIBES WORK TOWARD THE DEVELOPMENT OF MICROWAVE HOLOGRAPHY AS A DIAGNOSTIC METHOD FOR RADOMES, ANTENNAS, AND WAVE PROPAGATION. (AUTHOR) (U)

AD-745 025 17/7
RCA ADVANCED TECHNOLOGY LABS BURLINGTON MASS

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL). (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 FEB 71-30 JUN 72, JUN 72 114P BURTON,GARDNER T. ;CLAY,BURTON R. ;GORE,DOUGLAS A. ;PERRETTA,LOUIS A. ;TETREV,RONALD E. ;
CONTRACT: N62269-71-C-0134

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC DISPLAY SYSTEMS, DESIGN), (*NAVAL AIRCRAFT, *NAVIGATIONAL AIDS), GAS LASERS, DATA STORAGE SYSTEMS, MAP PROJECTION, INFORMATION RETRIEVAL, PHOTOGRAPHIC RECORDING SYSTEMS, STEREOSCOPIC PHOTOGRAPHY (U)

IDENTIFIERS: HOLOGRAPHY, HOLOGRAMS, HOLOGRAPHIC INFORMATION STORAGE, *MOVING MAP DISPLAYS (U)

HIGH PERFORMANCE AIRCRAFT PRESENT THE PROBLEM OF PROVIDING NAVIGATIONAL INFORMATION TO A PILOT (OR NAVIGATOR) IN A QUICK, CLEAR AND CONCISE MANNER. THIS REQUIREMENT HAS LED TO THE DEVELOPMENT OF THE CONCEPT OF THE MOVING MAP DISPLAY - FOR USE IN THE COCKPIT OF AN AIRCRAFT - WHICH IS DRIVEN DIRECTLY BY THE AIRCRAFT'S NAVIGATIONAL EQUIPMENT. THIS REPORT DESCRIBES WORK ACCOMPLISHED DURING THE COURSE OF A ONE-YEAR PROGRAM TO DESIGN AND CONSTRUCT A LABORATORY DEMONSTRATION MODEL OF A MOVING MAP DISPLAY SYSTEM, USING A CONCEPT WHICH EMPLOYS HOLOGRAPHIC STORAGE AND DISPLAY TECHNIQUES. THIS EXPLORATORY PROGRAM WAS THE SECOND IN A PROPOSED SERIES OF PROGRAMS LEADING TO THE GENERATION OF AN ADVANCED MOVING MAP DISPLAY SYSTEM. (AUTHOR) (U)

AD-745 730 13/9 14/2
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER ANNAPOLIS MD

THERMOGRAPHIC TECHNIQUES FOR INSPECTION OF BABBITTED BEARINGS. (U)

DESCRIPTIVE NOTE: RESEARCH AND DEVELOPMENT REPT.,
JUL 72 39P DICKEY,JOE (BRESCIA,NICHOLAS J, JR)
REPT. NO. NSRDC-28-124
PROJ. SF5154-1009
TASK: 15558

UNCLASSIFIED REPORT

DESCRIPTORS: (*JOURNAL BEARINGS, NON-DESTRUCTIVE TESTING), (*NON-DESTRUCTIVE TESTING, INFRARED RADIATION), NAVAL EQUIPMENT, INFRARED PHOTOGRAPHY, BONDING, STEREOSCOPIC PHOTOGRAPHY, DEFECTS(MATERIALS), ULTRASONIC RADIATION (U)

IDENTIFIERS: BEARING ALLOYS, HOLOGRAPHY, ULTRASONIC TESTS (U)

THE REPORT DESCRIBES THE INVESTIGATION OF SEVERAL THERMOGRAPHIC (INFRARED) TECHNIQUES AND THEIR APPLICABILITY TO THE DETECTION OF UNBONDED AREAS IN BABBITTED BEARINGS. STANDARD DEFECT SAMPLES WERE PREPARED WITH FILMS OF OIL AND GREASE BETWEEN LAYERS OF BABBITT AND STEEL. THESE SAMPLES WERE SYSTEMATICALLY INVESTIGATED BY TECHNIQUES DESIGNED TO (1) DETECT A 'THERMAL SHADOW' IN AN ARRANGMENT PROVIDING AN EQUILIBRIUM HEAT FLUX THROUGH THE SAMPLE, OR (2) DETECT DIFFERENCES IN THE TIME REQUIRED FOR DIFFERENT AREAS OF THE SAMPLE TO DISSIPATE AN IMPULSE OF HEAT. THE RESULTS INDICATE THAT SEVERAL TECHNIQUES ARE CAPABLE OF DETECTING UNBONDED AREAS AND THAT A TECHNIQUE OF MEASURING THE RETURN OF THE SAMPLE SURFACE TO EQUILIBRIUM TEMPERATURE FOLLOWING A THERMAL IMPULSE WAS MOST SENSITIVE TO THE SAMPLE DEFECTS. A DESIGN WAS DEVELOPED TO IMPROVE THE TECHNIQUE. SOME ULTRASONIC TEST RESULTS AND SOME TIME-AVERAGED INTERFERENCE HOLOGRAMS ARE ALSO PRESENTED. (AUTHOR) (U)

AD-745 968 9/3
TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14. (U)

DESCRIPTIVE NOTE: INTERIM REPT. 1 APR-30 SEP 71,
15 NOV 71 314P DOUGAL,ARWIN A. ;LAINIOTIS,D. G.
;FRIEDRICH,O. M. , JR;
CONTRACT: F44620-71-C-0091
PROJ. AF-4751
MONITOR: AFOSR TR-72-0473

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON THE JOINT SERVICES ELECTRONICS PROGRAM. SEE ALSO AD-709 945.

DESCRIPTORS: (*ELECTRONICS, ARMED FORCES RESEARCH), REVIEWS, MEDICAL RESEARCH, DATA PROCESSING SYSTEMS, ADAPTIVE CONTROL SYSTEMS, PLASMA PHYSICS, LASERS, SOLID STATE PHYSICS, MAGNETO-OPTIC EFFECT, MAGNETOMETERS, ELECTROMAGNETIC WAVES, THIN FILM STORAGE DEVICES, BOUNDARY VALUE PROBLEMS, AUTOMATA, NONLINEAR SYSTEMS, CRYOGENICS (U)

IDENTIFIERS: BIOENGINEERING, INFORMATION SYSTEMS, QUANTUM ELECTRONICS, NONLINEAR FILTERING, NONLINEAR ESTIMATION, *CONTROL THEORY, DIGITAL FILTERS, JOSEPHSON JUNCTIONS, PLASMA DIAGNOSTICS, AUTOMATA THEORY, TWO POINT BOUNDARY VALUE PROBLEMS, HOLOGRAPHY, CHEMICAL VAPOR DEPOSITION (U)

RESEARCH TOPICS IN PROGRESS, RECENT FINDINGS, AND FUTURE PLANS IN THE AREAS OF BIO-MEDICAL ELECTRONICS; INFORMATION; PLASMA AND QUANTUM ELECTRONICS; SOLID STATE ELECTRONICS; AND ACOUSTICS AND RADIO SCIENCES ARE PRESENTED. (AUTHOR) (U)

AD-746 134 14/2 14/5
NAVAL UNDERWATER SYSTEMS CENTER NEWPORT R I

APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY IN UNDERWATER ACOUSTICS RESEARCH. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
23 JUN 72 19P JOHNSON,CAMERON D. MAYER,GERALD M. ;
REPT. NO. NUSC-TR-4353
PROJ. NUSC-A-702-04, ZFXX-512-001

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, STEREOSCOPIC PHOTOGRAPHY), UNDERWATER EQUIPMENT, SONAR ARRAYS, PHOTOGRAPHIC TECHNIQUES (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, HOLOGRAPHY (U)

HOLOGRAPHIC INTERFEROMETRY HAS GAINED WIDE ACCEPTANCE AS A NONDESTRUCTIVE TESTING AND VIBRATION ANALYSIS TECHNIQUE SINCE ITS INTRODUCTION IN 1965. THE REPORT OUTLINES THE HISTORY OF HOLOGRAPHIC INTERFEROMETRY, DESCRIBES THE HOLOGRAPHY PROCESS, AND DESCRIBES SEVERAL APPLICATIONS REPRESENTATIVE OF THE PRESENT STATE OF THE ART OF HOLOGRAPHIC INTERFEROMETRY THAT ARE PARTICULARLY RELEVANT TO UNDERWATER ACOUSTICS WORK. POTENTIAL FUTURE APPLICATIONS ARE PRESENTED FOR CONSIDERATION. (AUTHOR) (U)

AD-746 268 14/2 1/3
GENERAL AMERICAN TRANSPORTATION CORP NILES ILL
GENERAL AMERICAN RESEARCH DIV

A REVIEW OF NONDESTRUCTIVE METHODS FOR THE DETECTION OF CONCEALED CRACKS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUL 71 31P KAMM,H. W. ;KRASKA,I. R. ;
CONTRACT: F33615-68-C-1429
PROJ. AF-7351
TASK: 735109
MONITOR: AFML TR-71-120

UNCLASSIFIED REPORT

DESCRIPTORS: (*DEFECTS(MATERIALS), *NON-DESTRUCTIVE TESTING), (*AIRFRAMES, CRACKS), MECHANICAL FASTENERS, CRACK PROPAGATION, VISUAL INSPECTION, MAGNETIC PROPERTIES, RADIOGRAPHY, STEREOSCOPIC PHOTOGRAPHY, ELECTRIC FIELDS, ULTRASONIC RADIATION, IMAGES, SOUND SIGNALS, ACCEPTABILITY (U)

IDENTIFIERS: *DYE PENETRANT TESTS, *MAGNETIC PARTICLE TESTS, *ULTRASONIC TESTS, *EDDY CURRENT TESTS, *HOLOGRAPHY, *ACOUSTIC IMPACT TESTS (U)

THE REPORT IS A DISCUSSION OF NDI METHODS FOR DETECTING CONCEALED CRACKS WITH EMPHASIS ON CRACK DETECTION UNDER FASTENERS AND PAINTED AND PLATED SURFACES. MANY METHODS ARE CONSIDERED. THEY ARE CLASSIFIED AS: RECOMMENDED, POTENTIALLY APPLICABLE, AND INAPPLICALBE. THE RECOMMENDED METHODS ARE ULTRASONIC AND EDDY CURRENT. THEY ARE NOW FIELD APPLICABLE. AN UETRASONIC METHOD CAN BE IMMEDIATELY APPLIED TO DETECTING CRACKS UNDER FASTENERS AND PLATED AND PAINTED SURFACES. EDDY CURRENTS CAN BE USED TO DETECT CRACKS THAT HAVE PROPAGATED BEYOND FASTENER HEADS, IN FASTENER HOLES (AFTER REMOVAL OF FASTENERS) AND UNDER PROTECTIVE SURFACES. BETWEEN THE TWO THEY SHOULD ALLOW INSPECTION OF MOST GEOMETRIES OF INTEREST. (AUTHOR) (U)

AD-746 498 847
BENDIX RESEARCH LABS SOUTHFIELD MICH

SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING. (U)

DESCRIPTIVE NOTE: FINAL REPT. 30 APR 71-31 MAY 72, JUL 72 138P STEINBERG,RONALD F. ;THUREN,JOHN B. ;
REPT. NO. RLD-6276
CONTRACT: H0210032, ARPA ORDER-1979
PROJ. ARPA-1F10, BRL-2411

UNCLASSIFIED REPORT

DESCRIPTORS: (•STRUCTURAL GEOLOGY, STEREOSCOPIC DISPLAY SYSTEMS), SEISMIC WAVES, UNDERGROUND STRUCTURES, FAULTS(GEOLOGY), SITE SELECTION, NEVADA, GEOLOGICAL SURVEY, MAPS (U)

IDENTIFIERS: •SEISMIC HOLOGRAPHY, ACOUSTIC HOLOGRAPHY, HOLOGRAPHY, NYE COUNTY(NEVADA), SIGNAL PROCESSING, COMPUTERIZED SIMULATION (U)

THE OBJECTIVE OF THIS RESEARCH PROGRAM WAS TO DEFINE A PRELIMINARY UNDERGROUND VIEWING SYSTEM, BASED ON ACOUSTIC HOLOGRAPHY PRINCIPLES, WHICH IS CAPABLE OF DETECTING AND IMAGING UNDERGROUND ANOMALIES ASSOCIATED WITH A SELECTED FIELD TEST SITE. SYSTEM REQUIREMENTS BASED ON THE GEOLOGY OF THE SELECTED SITE WERE SPECIFIED AND A PROPOSED FIELD TEST WAS DESIGNED. IN ADDITION, STUDIES TO DEVELOP A HOLOGRAPHIC WEAK SIGNAL ENHANCEMENT TECHNIQUE WERE MADE. (AUTHOR) (U)

AD-746 646 14/5
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER
CHARLOTTESVILLE VA

HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII), (U)

11 FEB 72 8P BONDARENKO,M. D. ;GNATOVSKII,A. V. ;SOSKINE,M. S. ;
REPT. NO. FSTC-HT-23-392-72
PROJ. FSTC-T7023012301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. FROM UKRAYINSKYI FIZYCHNYI ZHURNAL (USSR) V14 N11 NOV 69.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, OPTICAL PROPERTIES), COHERENT RADIATION, USSR (U)

IDENTIFIERS: TRANSLATIONS, *HOLOGRAPHY (U)

TO IMPROVE THE DIVERGENCE OF OKG RADIATION THE HOLOGRAPHIC METHOD OF TRANSFORMING THE COHERENT OF LIGHT FIELDS CAN BE ADOPTED BASED ON THE EQUALITY OF INTERFERENCE BEAMS. CORRECT RADIATION COULD BE USED FOR THE CREATION OF POSITIVE INVERSE COUPLING IN THE FIELD AND FOR THE IMPROVEMENT OF RADIATION OKG CHARACTERISTICS. (AUTHOR) (U)

AD-746 710 9/2 9/5
TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

AN EXPERIMENTAL INVESTIGATION OF THE VANDER LUGT MATCHED FILTER SYSTEM. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
MAY 72 52P ANDREW,GLENN C. ;DOUGAL,ARWIN A.
;
REPT. NO. TM-33
CONTRACT: F44620-71-C-0091
PROJ. AF-4751
MONITOR: AFOSR TR-72-1178

UNCLASSIFIED REPORT

DESCRIPTORS: (*READING MACHINES, CHARACTER RECOGNITION), (*OPTICAL FILTERS, DESIGN), (*CHARACTER RECOGNITION, AUTOMATION), MATCHED FILTERS, OPTICAL EQUIPMENT, OPTICAL PROPERTIES, PERFORMANCE(ENGINEERING) (U)

IDENTIFIERS: *OPTICAL CHARACTER RECOGNITION DEVICES, HOLOGRAMS (U)

VANDER LUGT INVENIED A METHOD OF OPTICAL MATCHED FILTERING WHICH COMBINED THE CONCEPT OF THE ELECTRICAL MATCHED FILTER AND HOLOGRAPHIC RECORDING OF PHASE AND AMPLITUDE OF AN OBJECT WAVE. THIS METHOD OF OPTICAL MATCHED FILTERING LENDS ITSELF TO OPTICAL CHARACTER RECOGNITION. THIS REPORT DESCRIBES THE FABRICATION OF A LOW COST VANDER LUGT MATCHED FILTER SYSTEM WHICH WAS BUILT AT THE QUANTUM ELECTRONICS RESEARCH LABORATORY AT THE UNIVERSITY OF TEXAS AT AUSTIN. THE SYSTEM IS THEORETICALLY DESCRIBED, AND THEN THE ACTUAL SYSTEM IS DESCRIBED IN DETAIL. THE EFFECT OF ROTATION OF THE INPUT CHARACTER WITH RESPECT TO THE ORIGINAL RECORDED LETTER ON THE CORRELATION SPOT IS PRESENTED. ALSO, A METHOD OF CONTROLLING THIS EFFECT IS PRESENTED AND EXPERIMENTALLY DEMONSTRATED. FINALLY, A SYSTEM EVALUATION AND AN IMPROVED METHOD OF THE VANDER LUGT MATCHED FILTER SYSTEM IS PRESENTED. (AUTHOR) (U)

AD-746 813 14/5 20/6
ARIZONA STATE UNIV TEMPE COLL OF ENGINEERING SCIENCES

SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY. (U)

6 OCT 71 3P PALAIS,J. C. ;VELLA,I. C. ;

CONTRACT: F44620-69-C-0025
PROJ. AF-9559
MONITOR: AFOSR TR-72-1486

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN APPLIED OPTICS, V11 N2 P481 FEB 72.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC TECHNIQUES), PHOTOGRAPHIC IMAGES, TIME STUDIES (U)

IDENTIFIERS: *HOLOGRAPHY, THEMIS PROJECT (U)

THE REPORT CONCERNS THE LIMITED HOLOGRAM EXPOSURE TIMES DUE TO STABILITY OF THE COMPONENTS OR DUE TO OBJECT MOTION. SOME NEW ASPECTS AND EXPERIMENTS USING SCANNED BEAM HOLOGRAPHY ARE PRESENTED. (AUTHOR) (U)

AD-746 859 20/6 14/5
NAVAL WEAPONS CENTER CHINA LAKE CALIF

A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL PUBLICATION,
JUN 72 20P MCCAULEY,D. G. ;SIMPSON,C. E. ;
MURBACH,W. J. ;
REPT. NO. NWC-TP-5288
PROJ. A20302/216-1W16-29000

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC DISPLAY SYSTEMS, DESIGN), VIEWING SCREENS, OPTICAL EQUIPMENT, PHOTOGRAPHIC MATERIALS, ACRYLIC RESINS, MANUFACTURING METHODS (U)

IDENTIFIERS: HOLOGRAPHIC INFORMATION STORAGE, POLYMETHYL METHACRYLATE, HOLOGRAPHY, THREE DIMENSIONAL DISPLAY SYSTEMS (U)

OFF-AXIS AND OFF-BISECTOR REFLECTION-TYPE HOLOGRAPHIC VISUAL DISPLAY ELEMENTS HAVE BEEN RECORDED IN DICHROMATED GELATIN DEPOSITED ON PLANAR OR SPHERICAL SHELL SUBSTRATES OF GLASS OR PLEXIGLAS. A PROCEDURE FOR BONDING GELATIN TO PLEXIGLAS IS GIVEN. HOLOGRAPHIC ELEMENTS ARE RECORDED AT THE ARGON WAVELENGTH OF 514.5 NM AND RECONSTRUCTED WITH SPECTRAL LINES FROM A LOW PRESSURE MERCURY ARC LAMP. (AUTHOR) (U)

AD-747 380 14/5
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

HOLOGRAPHY AND ITS APPLICATIONS, (U)

16 JUN 72 16P KARCZEWSKI,BOHDAN I
REPT. NO. FTD-HC-23-0302-72
PROJ. AF-1369

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF ELEKTRONIKA (POLAND) N4 P145-150 1971.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, REVIEWS), PHOTOGRAPHIC TECHNIQUES, PHOTOGRAPHIC IMAGES, COLOR PHOTOGRAPHY, POLAND (U)

IDENTIFIERS: TRANSLATIONS, *HOLOGRAPHY (U)

THE PAPER DESCRIBES BRIEFLY THE BASIC IDEAS OF HOLOGRAPHY AND ITS MAIN APPLICATIONS. (AUTHOR) (U)

AD-748 648 17/7 14/5
RCA ADVANCED TECHNOLOGY LABS BURLINGTON MASS

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (GROUND SUPPORT EQUIPMENT). (U)

DESCRIPTIVE NOTE: FINAL REPT. 30 JUN-31 DEC 71.
AUG 72 44P
CONTRACT: N62269-71-C-0652

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC DISPLAY SYSTEMS, OPTICAL PROPERTIES), (*NAVAL AIRCRAFT, *NAVIGATIONAL AIDS), PHOTOGRAPHIC RECORDING SYSTEMS, MAP PROJECTION, STEREOSCOPIC PHOTOGRAPHY, COLORS, DATA STORAGE SYSTEMS, TAPES, PROCESSING (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAMS, HOLOGRAPHIC INFORMATION STORAGE, *MOVING MAP DISPLAYS, EMBOSSING (U)

THE FEASIBILITY OF HOLOGRAPHICALLY STORING AND RETRIEVING AERIAL CHART INFORMATION FOR DISPLAY IN A COCKPIT ENVIRONMENT HAS BEEN DEMONSTRATED DURING TWO SEQUENTIAL EXPLORATORY DEVELOPMENT PROGRAMS, LEADING TO THE DEVELOPMENT OF A LABORATORY MODEL FOR A FULL COLOR HOLOGRAPHIC MOVING MAP DISPLAY SYSTEM. THE WORK DONE ON THIS CONTRACT HAD AS ITS PRIMARY GOAL THE DEFINITION AND CONSIDERATION OF THE HOLOGRAPHIC RECORDING PROCESS, AND IN PARTICULAR THE METHODS OF GENERATING THE COLOR SEPARATIONS REQUIRED FOR FULL COLOR RECORDING, METHODS OF REGISTERING THE SEPARATIONS DURING RECORDING, DEFINITION OF THE EXPOSURE LEVELS AND LATITUDES ALLOWABLE DURING EXPOSURE, AND METHODS OF REFINING THE DUPLICATION PROCESS FOR USE IN A NON-LABORATORY ENVIRONMENT. (AUTHOR) (U)

AD-749 118 14/5
HUGHES RESEARCH LABS MALIBU CALIF

NONLINEARITIES OF PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIALS, (U)

13 DEC 71 13P JENNEY, J. A. ;
CONTRACT: F44620-70-C-0092
PROJ. AF-9767
TASK: 976702
MONITOR: AFOSR TR-72-1786

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN APPLIED OPTICS, V11 N6 P1371-1381 JUN 72.

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *PHOTOGRAPHIC MATERIALS), POLYMERIZATION, LASERS, PLASTICS, LIGHT TRANSMISSION, DIFFRACTION, PHOTOGRAPHIC ACUTANCE, OPTICAL PROPERTIES, PHOTOGRAPHIC CONTRAST (U)

IDENTIFIERS: *PHOTOPOLYMERIZATION IMAGING, DRY PHOTOGRAPHIC PROCESSING, PHOTOPLASTIC RECORDING SYSTEMS, *HOLOGRAPHY (U)

AN ANALYSIS IS PRESENTED OF THE NONLINEAR EFFECTS OF HOLOGRAPHICALLY RECORDING DISCRETE IMAGE POINTS ON A PHASE RECORDING MATERIAL. THE ANALYSIS IS RESTRICTED TO THIN, TWO-AND THREE-BEAM HOLOGRAPHIC GRATINGS RECORDED ON A MATERIAL THAT EXHIBITS A LINEAR PHASE SHIFT VS EXPOSURE. HARMONICS, INTERMODULATION NOISE, AND SMALL SIGNAL EFFECTS ARE CONSIDERED. EXPERIMENTAL MEASUREMENTS WERE CARRIED OUT FOR THREE-BEAM HOLOGRAPHIC GRATINGS AND DIFFUSE OBJECT HOLOGRAMS RECORDED ON PHOTOPOLYMER RECORDING MATERIALS. INTERMODULATION NOISE IS FOUND TO BE A SERIOUS LIMITATION FOR DISCRETE IMAGE POINT HOLOGRAMS, BECAUSE THIS NOISE CANNOT BE SPATIALLY SEPARATED FROM THE DESIRED IMAGE POINTS. PHOTOPOLYMER GRATINGS WITH DB SIGNAL-TO-INTERMODULATION NOISE RATIO WERE OBTAINED WITH DIFFRACTION EFFICIENCY GREATER THAN 1/10% AT BEAM IRRADIANCE RATIOS OF 400:1. (U)

AD-749 137 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 46P PLUMBLEE,HARRY E. ;BURRIN,ROBERT H. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3, AD-749 138, AND VOLUME 1, AD-749 428.

DESCRIPTORS: (•JET ENGINE NOISE, ACOUSTIC PROPERTIES), (•SUPERSONIC PLANES, •JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: •SUPERSONIC JET NOISE, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY, •NOISE REDUCTION (U)

THE REPORT CONTAINS A DETAILED LIST OF PROPOSED RECOMMENDATIONS FOR WORK NECESSARY TO ATTAIN THE GOAL OF DEVELOPING TECHNOLOGY FOR SIGNIFICANTLY REDUCING SUPERSONIC AIRCRAFT PROPULSION SYSTEM NOISE. THE RECOMMENDATIONS AND PROPOSED WORK TASK ARE BASED ON THE RESEARCH FINDINGS REPORTED IN VOLUME 1 AND VOLUMES 3-6 OF THIS REPORT. RECOMMENDATIONS FOR EXPERIMENTAL AND THEORETICAL STUDIES OF TURBULENT-MIXING JET NOISE, SHOCK-ASSOCIATED NOISE AND UPSTREAM NOISE ARE DETAILED IN THE TECHNICAL PLAN. ALSO RECOMMENDATIONS FOR IMPROVEMENTS IN INSTRUMENTATION AND NOISE SUPPRESSION STUDIES ARE LISTED. (AUTHOR) (U)

AD-749 138 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME III. PROGRESS TOWARD A UNIFIED THEORY OF JET ENGINE NOISE. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 151P DOAK,PHILIP E.
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 4, AD-749 139, AND VOLUME 2, AD-749 137.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

EXISTING THEORIES OF AERODYNAMIC NOISE GENERATION ARE CRITICALLY REVIEWED WITH SPECIAL EMPHASIS ON CONCEPTUAL ADEQUACY AND PHYSICAL SCOPE WITH SPECIAL REFERENCE TO SUPERSONIC JET NOISE. IN THIS REVIEW THE BASIC WORK OF STOKES, KIRCHOFF AND RAYLEIGH ON FLUCTUATING MOTIONS IN FLUIDS IS RECALLED AND DEVELOPED TO PROVIDE A FIRM BASIS FOR THE CRITIQUE. THE ADVANTAGES AND DISADVANTAGES OF ACOUSTIC ANALOGY THEORIES SUCH AS LIGHTHILL'S ARE THOROUGHLY DISCUSSED IN SECTION II.3. A CONTRIBUTION IS MADE TOWARDS REMOVING THE CRITICISMS MADE BY LIGHTHILL OF RIBNER'S 'ISOTROPIC SOURCE TENSOR' THEORY. NEW DEVELOPMENTS SUCH AS THOSE BY CROW, LILLEY AND DOAK ARE EMPHASIZED. ON THE BASIS OF THE EVIDENCE PROVIDED BY THE CRITICAL REVIEW, A NEW UNIFIED THEORY FOR JET NOISE HAS BEEN DEVISED. (AUTHOR) (U)

AD-749 139 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 189P LILLEY,GEOFFREY M. ;PLUMBLEE, HARRY E. ;STRAHLE,WARREN C. ;RUO,SONG-YEONG ;DOAK, PHILIP E. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 5, AD-749 140, AND VOLUME 3, AD-749 138.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

THE REPORT PRESENTS A SERIES OF SPECIFIC THEORETICAL STUDIES DIRECTED TOWARD THE SOLUTION OF JET NOISE GENERATION AND RADIATION, UPSTREAM NOISE RADIATION AND COMBUSTION NOISE GENERATION. THREE THEORIES ARE PRESENTED. LILLEY'S WORK IS A NEW THEORY OF JET NOISE GENERATION, BASED ON IDENTIFICATION OF ACOUSTIC AND SOURCE GENERATION TERMS. THE ACOUSTIC 'CONVERTED WAVE EQUATION' DERIVED INCLUDES THE PRIDMORE-BROWN/MUNGUR SHEAR REFRACTION TERM. PLUMBLEE PRESENTS A THEORETICAL ANALYSIS AND NUMERICAL SOLUTION TECHNIQUES FOR SOLVING FOR THE RADIATION FIELD FROM A SOURCE WITHIN A JET FLOW AND SPECIFICALLY DEALS WITH RADIATION FROM AN ACOUSTIC DISTRIBUTION INITALLY SPECIFIED AT THE END OF A CIRCULAR EXHAUST DUCT TERMINATION THROUGH THE JET FLOW TO THE SURROUNDING MEDIUM.

AD-749 140 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V. AN EXPERIMENTAL INVESTIGATION OF JET NOISE VARIATION WITH VELOCITY AND TEMPERATURE. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 172P LUSH,PETER A. ;BURRIN,ROBERT H. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-5

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 6, AD-749 141, AND VOLUME 4, AD-749 139.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

A SERIES OF EXPERIMENTS WAS CONDUCTED FOR THE PURPOSE OF CLEARLY ISOLATING AND QUANTIFYING THE NOISE SOURCES ASSOCIATED WITH SUPERSONIC JET NOISE AND FOR ESTABLISHING THE EFFECT OF REFRACTION ON THE RADIATED FIELD OF THESE SOURCES, AS WELL AS THE RADIATION FIELD CHARACTERISTICS OF THESE SOURCES. RESULTS FROM THE TURBULENT-MIXING TESTS AND THE SHOCK-ASSOCIATED TESTS ARE APPENDED TO THIS REPORT IN SEPARATE VOLUMES. THE TURBULENCE NOISE 1/3 OCTAVE CORRECTED DATA APPEAR IN APPENDIX I AND THE SHOCK-ASSOCIATED NARROW-BAND SPECTRA APPEAR IN APPENDIX 2. (AUTHOR) (U)

AD-749 141 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 57P BURRIN,ROBERT H. ;LUSH,PETER A. ;WYNNE,GEORGE A. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-5-APP-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 7, AD-749 142, AND VOLUME 5, AD-749 140.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

A SERIES OF EXPERIMENTS WAS CONDUCTED FOR THE PURPOSE OF CLEARLY ISOLATING AND QUANTIFYING THE NOISE SOURCES ASSOCIATED WITH SUPERSONIC JET NOISE AND FOR ESTABLISHING THE EFFECT OF REFRACTION ON THE RADIATED FIELD OF THESE SOURCES, AS WELL AS ESTABLISHING THE RANGE OF VALIDITY OF AVAILABLE THEORETICAL FORMULAS FOR PREDICTING THE RADIATION FIELD CHARACTERISTICS OF THESE SOURCES. TURBULENT MIXING REGION NOISE FROM A FULLY EXPANDED SUPERSONIC FLOW EXHAUSTING FROM A WELL DESIGNED CONVERGENT-DIVERGENT NOZZLE WAS MEASURED OVER A VERY WIDE RANGE OF OPERATIONAL PARAMETERS. THIS APPENDIX CONTAINS COMPUTER PRINTOUTS OBTAINED FROM A JET NOISE DATA ANALYSIS PROGRAM FOR TURBULENT MIXING REGION NOISE. (AUTHOR) (U)

AD-749 142 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE, VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 243P LUSH,PETER A. ;BURRIN,ROBERT H.
;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-5-APP-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 6, AD-749 143, AND VOLUME 5, AD-749 141.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

A SERIES OF EXPERIMENTS WAS CONDUCTED FOR THE PURPOSE OF CLEARLY ISOLATING AND QUANTIFYING THE NOISE SOURCES ASSOCIATED WITH SUPERSONIC JET NOISE AND FOR ESTABLISHING THE EFFECT OF REFRACTION ON THE RADIATED FIELD OF THESE SOURCES, AS WELL AS ESTABLISHING THE RANGE OF VALIDITY OF AVAILABLE THEORETICAL FORMULAS FOR PREDICTING THE RADIATION FIELD CHARACTERISTICS OF THESE SOURCES. SHOCK-ASSOCIATED NOISE, BOTH DISCRETE AND BROADBAND, WAS INVESTIGATED THOROUGHLY. THIS APPENDIX CONTAINS SEQUENCES OF DATA IN THE FORM OF NARROW BAND SPECTRA ILLUSTRATING THE EXISTENCE OF THESE TYPES OF SHOCK ASSOCIATED NOISE IN THE JET FLOWS INVESTIGATED. (AUTHOR) (U)

AD-749 143 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 320P FISHER,MICHAEL J, ;MAYO,WILLIAM T. ;MEADOWS,DONALD M. ;BURRIN,ROBERT H. ;BEISEL,GEORGE E. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-6

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 5, AD-749 142.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, AERODYNAMIC NOISE, SOUND TRANSMISSION, GAS TURBINE, NOZZLES, AFTERBURNING, JET MIXING FLOW, COMBUSTION, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, *NOISE REDUCTION, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY (U)

THE REPORT DESCRIBES THREE REMOTE SENSING DEVICES DEVELOPED TO MEASURE JET EXHAUST FLUCTUATING DENSITY GRADIENTS, MEAN AND TURBULENT VELOCITY AND MEAN TEMPERATURE ARE DESCRIBED. THESE INSTRUMENTS ARE A CROSSED-BEAM SCHLIEREN, A LASER DOPPLER VELOCIMENTER, AND A PULSED LASER INTERFEROMETER. A JET TURBULENCE FACILITY WAS DEVELOPED, ALONG WITH FIVE 2 INCH DIAMETER JET NOZZLES (ONE CONVERGENT AND FOUR CON-DIV, UP TO MACH 2.0), FOR THE PURPOSE OF PROVIDING LABORATORY CONTROLLED CONDITIONS, IN ORDER TO PROPERLY EVALUATE THE REMOTE SENSING INSTRUMENTS. (AUTHOR) (U)

AD-749 428 20/1 21/5 1/3
LOCKHEED-GEORGIA CO MARIETTA

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. 1 MAY 71-31 MAY 72,
JUL 72 47P PLUMBLEE,HARRY E. ;DOAK,PHILIP E. ;
CONTRACT: F33615-71-C-1663
PROJ. AF-3066
TASK: 306614
MONITOR: AFAPL TR-72-53-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-749 127.

DESCRIPTORS: (*JET ENGINE NOISE, ACOUSTIC PROPERTIES), (*SUPERSONIC PLANES, *JET PLANE NOISE), ACOUSTICS, JET MIXING FLOW, SOUND TRANSMISSION, GAS TURBINE NOZZLES, AFTERBURNING, COMBUSTION, AERODYNAMIC NOISE, LASERS, INTERFEROMETERS (U)

IDENTIFIERS: *SUPERSONIC JET NOISE, NEAR FIELD NOISE, FAR FIELD NOISE, ACOUSTIC FIELDS, ACOUSTIC MEASUREMENT, HOLOGRAPHY, *NOISE REDUCTION (U)

THIS IS A SUMMARY REPORT OF THE RESULTS OF A 13-MONTH RESEARCH PROGRAM ON THE GENERATION AND REDUCTION OF SUPERSONIC JET NOISE. THIS PROGRAM WAS PLANNED AS THE FIRST PHASE OF A FOUR-PHASE EFFORT. TASKS COMPROMISING THIS PHASE 1 PROGRAM WERE AS FOLLOWS: REVIEWS AND EVALUATION OF EXISTING THEORETICAL MODELS FOR SUPERSONIC JET NOISE GENERATION AND RADIATION; DEVELOPMENT OF THE FRAMEWORK OF A NEW, UNIFIED THEORY OF AERODYNAMIC NOISE; DEVELOPMENT OF A NEW THEORETICAL MODEL OF TURBULENT MIXING REGION NOISE; DEVELOPMENT OF A NEW THEORETICAL MODEL FOR CALCULATING PROGAGATION AND RADIATION OF UPSTREAM NOISE; A PRELIMINARY REVIEW OF COMBUSTION NOISE; TESTS ON TURBULENT MIXING REGION NOISE AND SHOCK-ASSOCIATED NOISE; REVIEW OF THE PROBLEMS OF JET FLOW MEASUREMENT AND ANALYSIS; DEVELOPMENT OF NEW INSTRUMENTATION FOR JET FLOW MEASUREMENT; ESTABLISHMENT OF FULL FACILITIES FOR THE TOTAL PROGRAM; FORMULATION OF THE PROGRAM FOR FUTURE STUDIES. (AUTHOR) (U)

AD-749 854 20/4 14/2
AIR FORCE ROCKET PROPULSION LAB EDWARDS AFB CALIF

HOLOGRAPHY AS APPLIED TO JET BREAKUP AND AN ANALYTICAL METHOD FOR REDUCING HOLOGRAPHIC DROPLET DATA. (U)

DESCRIPTIVE NOTE: FINAL REPT. DEC 69-MAY 72,
SEP 72 277P GEORGE,DAWEEL J. ;SPAID,FRANK W.
;
REPT. NO. AFRPL-TR-72-72
PROJ. AF-3058
TASK: 305808

UNCLASSIFIED REPORT

DESCRIPTORS: (*SUPERSONIC FLOW, FLOW VISUALIZATION), (*FLOW VISUALIZATION, STEREOSCOPIC PHOTOGRAPHY), FLOW FIELDS, DROPS, DISTRIBUTION FUNCTIONS, WIND TUNNELS, COMPUTER PROGRAMS (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC INFORMATION STORAGE (U)

THE USE OF HOLOGRAPHY IN STUDYING CERTAIN FLUID MECHANICS PROBLEMS WAS INVESTIGATED. THIS EFFORT SPECIFICALLY EXAMINED THE APPLICATION OF HOLOGRAPHY TO: (1) HIGH SPEED (SUPERSONIC) FLOW FIELDS BY INJECTING DIFFERENT LIQUID JETS PERPENDICULARLY INTO A MACH 3 GAS STREAM TO OBSERVE HOW JET BREAKUP OCCURS, AND (2) THE ATOMIZATION CHARACTERISTICS (DROPLET SIZE AND SPATIAL DISTRIBUTION) OF A LIQUID JET INJECTED INTO QUIESCENT, ATMOSPHERIC AIR. THE HOLOGRAMS WERE RECORDED IN THE OFF-AXIS, FRESNEL, TRANSMISSION ARRANGEMENT. THE ANALYTICAL METHOD FOR PROCESSING THREE-DIMENSIONAL DROPLET DATA CONSISTED OF A SYSTEM OF COMPUTER PROGRAMS WHICH OPERATED ON THE DROPLET SIZE AND SPATIAL COORDINATES TO DETERMINE SIZE, MASS, NUMBER AND SPATIAL DISTRIBUTION. TWO METHODS FOR RETRIEVING HOLOGRAPHIC DATA WERE DEVISED. (AUTHOR) (U)

AD-750 184 14/2
PERKIN-ELMER CORP NORWALK CONN OPTICAL GROUP

INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. NOV 68-AUG 70, APR 71 139P ARNDT,WALTER R. ;KREUZER,JUSTIN L. ;
REPT. NO. PE-ER-10462
CONTRACT: DAAG46-69-C-0010, ARPA ORDER-1249
MONITOR: AMMRC CR-70-14(F)

UNCLASSIFIED REPORT

DESCRIPTORS: (*NON-DESTRUCTIVE TESTING, ULTRASONIC RADIATION), STEREOSCOPIC PHOTOGRAPHY, LASERS, INTERFEROMETERS, DEFECTS(MATERIALS), PHOTOGRAPHIC RECORDING SYSTEMS, PHOTOGRAPHIC PROCESSORS, TEST METHODS, MICROSCOPES (U)

IDENTIFIERS: HOLOGRAPHY, INTERFEROMETRIC HOLOGRAPHY, *ULTRASONIC HOLOGRAPHY, ACOUSTIC HOLOGRAPHY (U)

THE PURPOSE OF THIS RESEARCH PROGRAM WAS TO ANALYZE AND PERFORM EXPERIMENTAL DEMONSTRATIONS OF THE APPLICATION OF ULTRASONIC HOLOGRAPHIC AND ULTRASONIC LIGHT DIFFRACTION TECHNIQUES TO THE DETECTION, ANALYSIS, AND EXAMINATION OF THE INTERVAL STRUCTURE OF OPTICALLY OPAQUE MATERIALS. A HOLOGRAPHIC SCANNER, OPERATED IN SEVERAL MODES, WAS USED TO PRODUCE MORE THAN 130 HOLOGRAMS, WHICH WERE ILLUMINATED WITH A LASER TO RECONSTRUCT VISIBLE ACOUSTIC IMAGES. SEVERAL CONFIGURATIONS OF A BRAGG DIFFRACTION MICROSCOPE WERE USED TO PRODUCE COMPARISON IMAGES. TECHNIQUES FOR REAL TIME COMPUTER CONSTRUCTED IMAGES WERE DEMONSTRATED. THE REPORT INCLUDES DETAILS OF THE ANALYSES AND EXPERIMENTS AND INDICATES DESIGN APPROACHES FOR PRACTICAL NONDESTRUCTIVE TESTING SYSTEMS. (AUTHOR) (U)

AD-750 250 14/5
NAVAL TRAINING EQUIPMENT CENTER ORLANDO FLA

THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
AUG 72 16P MOHON,WINDELL N. ;RODEMANN,
ALFRED H. ;BREGLIA,DENIS R. ;
REPT. NO. NAVTRAEQUIPCEN-TN-25
PROJ. NAVTRAEQUIPCEN-1718-03

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, PHOTOGRAPHIC TECHNIQUES), PHOTOGRAPHIC RECORDING MEDIA, CYLINDRICAL BODIES, COLOR PHOTOGRAPHY (U)

IDENTIFIERS: *HOLOGRAPHY (U)

THE USE OF A HOLOGRAM AS A STATIC THREE DIMENSIONAL VISUAL DISPLAY IS SOMEWHAT RESTRICTED BY THE LIMITED VIEWING ANGLE. THIS VIEWING ANGLE IS A FUNCTION OF THE GEOMETRIC RELATIONS BETWEEN THE SIZE OF THE OBJECT TO BE RECORDED, THE DISTANCE FROM THE OBJECT TO THE RECORDING MEDIUM, AND THE SIZE AND SHAPE OF THE RECORDING MEDIUM. A TYPICAL HOLOGRAM IS MADE ON A FLAT PHOTOGRAPHIC PLATE WITH THE VIEWING ANGLE CONSEQUENTLY LIMITED BY THE EDGES OF THE PLATE. ONE TECHNIQUE FOR EXTENDING THE VIEWING ANGLE TO THREE HUNDRED AND SIXTY DEGREES (IN ONE PLANE) IS TO USE A FLEXIBLE RECORDING MEDIUM WHICH EXTENDS AROUND THE OBJECT WHEN PROPERLY ILLUMINATED. THE RESULTING HOLOGRAM YIELDS A THREE HUNDRED AND SIXTY DEGREE VIEWING ANGLE OF THE THREE DIMENSIONAL HOLOGRAPHIC IMAGE. SPECIFIC STEPS IN THE EXPERIMENTAL DEVELOPMENT ARE DESCRIBED. PROCEDURAL PROBLEMS, SUCH AS VIBRATION AND INTENSITY NON-UNIFORMITIES, ARE DISCUSSED. METHODS AND EQUIPMENTS WHICH LEAD TO SATISFACTORY HOLOGRAMS ARE OUTLINED. A SIMPLE METHOD FOR RECONSTRUCTION AND VIEWING IS DESCRIBED. PICTURES OF RESULTANT HOLOGRAMS ARE GIVEN. CONSIDERATION IS GIVEN TO EXTENSION OF THE TECHNIQUE TO THREE HUNDRED AND SIXTY DEGREES IN BOTH HORIZONTAL AND VERTICAL PLANES. (AUTHOR) (U)

AD-870 186 20/4 20/5 21/5
PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY. (U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 69-APR 70 ON ITEM 1, JUN 70 107P. ALWANG,WALTER G. ;CAVANAUGH, LAWRENCE A. ;BURR,RONALD J. ;HAUER,ALLAN ;
REPT. NO. PWA-3942
CONTRACT: N00019-69-C-0322
PROJ. R010-04-02

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIRCRAFT ENGINES, GAS FLOW), (*FLOW VISUALIZATION, *LASERS), INTERFEROMETERS, GAS TURBINES, VELOCITY, THREE-DIMENSIONAL FLOW, DENSITY (U)

IDENTIFIERS: *HOLOGRAPHY, HOLOGRAPHIC VELOCIMETRY, HOLOGRAPHIC INTERFEROMETRY (U)

THE OBJECTIVE OF THE WORK IS THE DEVELOPMENT OF OPTICAL METHODS FOR VISUALIZING AND MEASURING GAS FLOW IN TURBOMACHINERY. THE WORK IN FLOW VISUALIZATION CONCENTRATED ON AN INVESTIGATION OF THE METHODS OF HOLOGRAPHIC INTERFEROMETRY USING SMALL SCALE FLOW RIGS. IT WAS FOUND THAT FLOW/NO FLOW HOLOGRAMS CAN BE ANALYZED TO YIELD THREE-DIMENSIONAL GAS DENSITY DISTRIBUTIONS. BECAUSE OF STABILITY REQUIREMENTS, HOWEVER, SINGLE-EXPOSURE DOUBLE-PULSE HOLOGRAMS ARE MORE EASILY APPLIED TO TURBOMACHINERY. THESE PERMIT THE VISUALIZATION, IN THREE DIMENSIONS, OF DENSITY GRADIENTS IN MOTION SUCH AS SHOCKS, TURBULENT WAKES AND ACOUSTIC PHENOMENA. THE MEASUREMENT OF GAS VELOCITY AT A POINT USING LASER DOPPLER VELOCIMETRY (LDV) WAS ALSO INVESTIGATED. A DUAL BEAM OPTICAL CONFIGURATION WAS DEVELOPED WHICH, BECAUSE OF ITS INSENSITIVITY TO VIBRATION AND ITS GOOD LIGHT COLLECTION EFFICIENCY, IS ESPECIALLY USEFUL FOR APPLICATION TO TURBOMACHINERY. IN GENERAL, IT IS CONCLUDED THAT BOTH HOLOGRAPHY AND OPTICAL DOPPLER VELOCIMETRY OFFER MANY POTENTIAL ADVANTAGES FOR MEASUREMENT OF GAS FLOW. FORMS OF THE APPARATUS MOST SUITABLE FOR USE IN TURBOMACHINERY ARE DESCRIBED. (AUTHOR) (U)

AD-871 156 20/6 17/8 14/5
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

OPTICAL SPATIAL FILTER ANALYSIS. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. MAY-DEC 69,
MAY 70 43P WASIELEWSKI, JAMES E.
REPT. NO. RADC-TR-70-69
PROJ. AF-6244

UNCLASSIFIED REPORT

DESCRIPTORS: (*OPTICAL IMAGES, *TARGET RECOGNITION), (*OPTICAL FILTERS, MATHEMATICAL ANALYSIS), PHOTOGRAPHIC TECHNIQUES, DIFFRACTION, COHERENT RADIATION, OPTICAL TRACKING (U)

IDENTIFIERS: HOLOGRAPHY (U)

THE STUDY WAS CONDUCTED TO DETERMINE THE EXISTING OPTIMUM OPTICAL SPATIAL FILTER FOR AUTOMATIC TARGET RECOGNITION. TWO DIFFERENT TYPES OF SPATIAL FILTERS (MATCHED AND INVERSE) USING TWO UNIQUE FABRICATION METHODS (HOLOGRAPHIC AND IN-LINE) WERE TESTED AS A FUNCTION OF TARGET SCALE, ORIENTATION, CONTRAST AND OBSCURATION. THE PERFORMANCE VALUES FOR EACH FILTER AND FABRICATION METHOD WERE ANALYZED. AN OPTIMUM OVERALL FILTER WAS SELECTED AND A PRELIMINARY ANALYSIS WAS CONDUCTED TO DETERMINE THE EFFECTS OF CONTINUOUS TONE IMAGERY ON FILTER PERFORMANCE. (AUTHOR) (U)

AD-872 988 14/5 20/5
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

AN INVESTIGATION OF HOLOGRAPHIC PARAMETERS. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
MAR 70 35P POLCYN,ROGER F. ;
REPT. NO. NAVTRADEVCEN-TN-11
PROJ. NAVTRADEVCEN-7881-41

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *LASERS), (*PHOTOGRAPHIC PLATES, EXPOSURE), DIFFRACTION, BRIGHTNESS, PHOTOGRAPHIC FOG (U)

IDENTIFIERS: *HOLOGRAPHY, *HOLOGRAMS, OPTICAL DENSITY (U)

THE EFFECT OF PRESENSITIZING THE HIGH RESOLUTION PHOTOGRAPHIC PLATES USED TO RECORD HOLOGRAMS WAS EXPERIMENTALLY INVESTIGATED. PRESENSITIZATION CONSISTED IN EXPOSING THE PLATE TO A UNIFORM EXPOSURE BY A SMALL QUANTITY OF LIGHT SUCH THAT THE SITES WITHIN THE EMULSION ARE EXPOSED TO THE THRESHOLD OF DEVELOPABILITY. THE EXPERIMENTAL PROCEDURE CONSISTED OF COMPARING VIRTUAL HOLOGRAPHIC IMAGE LUMINANCE FOR PRE-EXPOSED HOLOGRAMS AND NOT PRE-EXPOSED HOLOGRAMS. READINGS WERE TAKEN THROUGH VARIOUS PORTIONS OF THE HOLOGRAM PLATE AS WELL AS AT VARIOUS ANGULAR ORIENTATIONS. RESULTS INDICATE THAT BRIGHTER IMAGES AS WELL AS 'CLEANER' PLATES RESULT FROM PRESENSITIZATION. ALL LUMINANCE MEASUREMENTS WERE MADE WITH A SPECTRA-PRITCHARD PHOTOMETER. (AUTHOR) (U)

AD-874 638 14/5 20/5
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

POLARIZATION EFFECTS IN HOLOGRAPHY. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
FEB 70 13P MOHON,WINDELL N. ;ALONSO,JOSE ;
JR.;RODEMANN,ALFRED H. ;
REPT. NO. NAVTRADEVCEN-TN-9
PROJ. NAVTRADEVCEN-7881-41

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *LASERS), DIFFRACTION, PHOTOMETERS, TEST METHODS, POLARIZATION (U)

IDENTIFIERS: *HOLOGRAPHY, HELIUM NEON LASERS (U)

HOLOGRAMS WERE MADE OF THE REFLECTED BEAM FROM A SIMPLE OBJECT WHICH HAD ITS ANGLE OF POLARIZATION VARIED FROM PARALLEL TO ORTHOGONAL IN RELATION TO THE POLARIZATION IN THE REFERENCE BEAM. THE BRIGHTNESS OF THE LIGHT DIFFRACTED INTO THE IMAGE BY THE HOLOGRAM WAS MEASURED WITH A SPECTRA-PRITCHARD PHOTOMETER. THE RESULTS ARE PRESENTED IN GRAPHICAL FORM. IT WAS CONCLUDED THAT POLARIZATION PHASE ANGLES SHOULD NOT EXCEED ABOUT FIFTEEN DEGREES WHEN CALCULATING THE BEAM RATIOS FOR HOLOGRAMS. (AUTHOR) (U)

AD-874 649 20/5 14/5
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO
SCHOOL OF ENGINEERING

COHERENCE PROPERTIES OF A PULSED RUBY LASER. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 70 100P HOLLEY,THURSTON C. I
REPT. NO. GSP/PH/70-12

UNCLASSIFIED REPORT

DESCRIPTORS: (*LASERS, *COHERENT RADIATION), (*STEREOSCOPIC PHOTOGRAPHY, LASERS), INTERFEROMETERS, MODEL THEORY, TEST METHODS, DIFFRACTION GRATINGS, MATHEMATICAL ANALYSIS, RUBY, POLARIZATION, THESES (U)

IDENTIFIERS: *RUBY LASERS, PULSED LASERS, INTERFERENCE PATTERNS, HOLOGRAPHY, DIFFRACTOMETERS (U)

THE COHERENCE PROPERTIES OF A PULSED RUBY, MULTI-MODE LASER WERE DETERMINED BY RECORDING THE TIME-AVERAGED EFFECT OF THE RADIATION FIELD ON PHOTOGRAPHIC EMULSION. THE RECORDED RELATIVE INTENSITY DISTRIBUTIONS WERE ANALYZED AND COMPARED WITH A THEORETICAL, SINGLE MODE PREDICTION. THE LASER BEAM WAS EXPANDED TO A ONE-INCH DIAMETER BEAM. THEN, WITH THE AID OF A TWYMAN-GREEN INTERFEROMETER, A TEMPORAL COHERENCE LENGTH OF APPROXIMATELY 1.27 CENTIMETERS WAS OBSERVED. ALSO, FOR AN APERTURE RADIUS OF 0.51 MILLIMETERS, IN CONJUNCTION WITH A MODIFIED YOUNGS EXPERIMENT, A SPATIAL COHERENCE LENGTH OF APPROXIMATELY 2.2 MILLIMETERS WAS OBSERVED. (AUTHOR) (U)

AD-874 653 14/5 20/5 14/2
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO
SCHOOL OF ENGINEERING

HOLOGRAPHIC INTERFEROMETRIC FRINGE ANALYSIS AND MEASUREMENTS OF CONTROLLED SURFACE DISPLACEMENTS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
JUN 70 92P RATNER,GEORGE H. ;
REPT. NO. GSP/PH/70-18

UNCLASSIFIED REPORT

DESCRIPTORS: (*STEREOSCOPIC PHOTOGRAPHY, *LASERS), (*MOTION, MEASUREMENT), INTERFEROMETERS, PIEZOELECTRIC TRANSDUCERS, TEST METHODS, REAL TIME, SURFACES, VIBRATION, THESES (U)

IDENTIFIERS: *INTERFEROMETRIC HOLOGRAPHY, *HOLOGRAPHY, HELIUM NEON LASERS, REAL TIME HOLOGRAPHY, INTERFERENCE PATTERNS, INTEROGRAMS, HOLOGRAMS, DOUBLE EXPOSURE, FROZEN HOLOGRAMS (U)

PIEZOELECTRIC TRANSDUCERS WERE USED TO CONTROL SMALL DISPLACEMENTS OF A DIFFUSELY REFLECTING SURFACE. USING DOUBLE EXPOSURE AND REAL TIME HOLOGRAPHIC TECHNIQUES, THE RELATIONSHIP BETWEEN THE SURFACE MOTION AND RESULTING INTERFERENCE FRINGE PATTERNS WAS STUDIED. THE EXTENT OF THE SURFACE DISPLACEMENT WAS MEASURED FROM THE TWO AND THREE DIMENSIONAL NATURE OF THE INTERFERENCE FRINGES. THE INTERFEROMETRIC RESULTS WERE CORRELATED WITH THE ACTUAL DISPLACEMENTS. THE RESULTS INDICATE THAT HOLOGRAPHIC INTERFEROMETRY CAN BE USED AS A PRACTICAL METHOD TO OBTAIN DEFORMATIONS OF THREE DIMENSIONAL OBJECTS AND THAT PIEZOELECTRIC TRANSDUCERS ARE AN EFFECTIVE AID FOR THE STUDY OF HOLOGRAPHIC INTERFEROMETRY. (AUTHOR) (U)

AD-885 331 9/2 9/5 20/2 14/5
RCA LABS PRINCETON N J

PHASE HOLOGRAPHIC STORAGE MEDIA FOR DISPLAY APPLICATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 5 JUN 70-4 JUN 71,
JUN 71 118P AMODEI,JUAN J. ;PHILLIPS,WILLIAM ;STAEBLER,DAVID L. ;
CONTRACT: N62269-70-C-0372

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA STORAGE SYSTEMS, *ELECTROOPTICS), (*DISPLAY SYSTEMS, STEREOSCOPIC PHOTOGRAPHY), (*CRYSTAL GROWTH, NIOBATES), COHERENT RADIATION, LASERS, MAPS, DOPING, LITHIUM COMPOUNDS, SODIUM COMPOUNDS, BARIUM COMPOUNDS (U)

IDENTIFIERS: *HOLOGRAPHY, SODIUM BARIUM NIOBATES, LITHIUM NIOBATES, HOLOGRAPHIC INFORMATION STORAGE (U)

THE REPORT DESCRIBES THE RESULTS OBTAINED DURING A ONE-YEAR PROGRAM AIMED AT DEVELOPING IMPROVED MATERIALS AND TECHNIQUES FOR PHASE HOLOGRAPHIC STORAGE OF MAPS AND OTHER PICTORIAL INFORMATION. THE RESULTS OF THE PROGRAM INCLUDED THE DEVELOPMENT OF FE-DOPED $LiNbO_3$ CRYSTALS, THE CONCEPTION AND IMPLEMENTATION OF THERMAL FIXING TECHNIQUES THAT PERMIT ERASURE-RESISTANT STORAGE IN $LiNbO_3$ AND $Ba_2NaNb_5O_{15}$, AND THE DEVELOPMENT OF NEW ORGANIC MATERIALS THAT GIVE HIGH DIFFRACTION EFFICIENCY, LONG-TERM STORAGE, AND FEATURE SELF-FIXING OPERATION. THE RESULTS OF EXPERIMENTATIONS WITH MANY OTHER MATERIALS AND NEW THEORETICAL WORK CARRIED OUT DURING THE PROGRAM ARE ALSO DETAILED IN THE REPORT. (AUTHOR) (U)

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AD-742 619

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HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,
AD-708 641

* * *

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HOLOGRAPHIC APPLICATIONS IN SHADOWGRAPH, SCHLIEREN, AND INTERFEROMETRY ANALYSES OF HEAT TRANSFER AND FLUID FLOW TEST SUBJECTS,
AD-717 702

* * *

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OPTICAL METHODS FOR CONDUCTING NONDESTRUCTIVE TESTING OF FUEL FILTER ELEMENTS.
AD-731 237

* * *

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DETERMINATION OF SILVER PERCHLORATE DIFFUSION COEFFICIENT BY HOLOGRAPHIC INTERFEROMETRY.
AD-743 310

* * *

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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES.
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* * *

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* * *

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* * *

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* * *

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AD-749 143

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INVESTIGATIONS BY ANALYTIC AND THEORETICAL PROCEDURE OF VISIBILITY FUNCTIONS.
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* * *

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INVESTIGATION OF A CLASS OF ELECTROMAGNETIC BOUNDARY VALUE PROBLEMS.
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* * *

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GENERALIZED FOURIER TECHNIQUES FOR THE THEORY OF LIGHT SCATTERING.
AD-720 858

* * *

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PERFORMANCE TESTING OF THE GROUND-BASED AND SNOWFLAKE DISDROMETER SYSTEMS.
AD-722 452

* * *

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FOG DROP-SIZE DISTRIBUTIONS MEASURED WITH A LASER HOLOGRAM CAMERA,
AD-731 087

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OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
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* * *

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TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY.
AD-725 748

* * *

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A TECHNIQUE FOR OBTAINING IMPROVED REAL-TIME HOLOGRAPHIC INTERFEROMETRIC DATA USING PULSE MODULATED ILLUMINATION.
AD-723 632

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DS/PH/71-3
DETERMINATION OF SPATIAL AND TEMPORAL ELECTRON DENSITY AND TEMPORAL ELECTRON TEMPERATURE IN LASER-PRODUCED GASEOUS DEUTERIUM PLASMAS.
AD-734 246

* * *

GA/ME/72-1
HOLOGRAPHIC-INTERFEROMETER INVESTIGATION OF FREE-CONVECTION FROM A NON-UNIFORMLY-HEATED VERTICAL PLATE.
AD-724 698

* * *

GSP/PH/70-12
COHERENCE PROPERTIES OF A PULSED RUBY LASER.
AD-874 649

* * *

GSP/PH/70-18
HOLOGRAPHIC INTERFEROMETRIC FRINGE ANALYSIS AND MEASUREMENTS OF CONTROLLED SURFACE DISPLACEMENTS.
AD-874 653

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A REVIEW OF NONDESTRUCTIVE METHODS FOR THE DETECTION OF CONCEALED CRACKS.
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RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
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MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER

SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,
AD-710 144

* * *

AFOSR-70-2819TR
FULL VIEW HOLOGRAMS,
AD-716 276

* * *

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CRITICAL THOUGHTS ON STRUCTURAL MECHANICS AND NDE,
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* * *

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LIQUID CRYSTAL DISPLAYS FOR MATCHED FILTERING,
AD-717 170

* * *

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MODERN OPTICS.
AD-717 775

* * *

AFOSR-TR-71-2260
THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER,
AD-728 341

* * *

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FIXING OF PHOTOPOLYMER HOLOGRAMS,
AD-730 269

* * *

AFOSR-TR-71-2655
A STUDY OF NETWORK AND SYSTEM SENSITIVITY OF SIGNAL PROCESSORS FOR USE IN AIR FORCE SYSTEMS SUCH AS COMMAND AND CONTROL SYSTEMS.
AD-731 294

* * *

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PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES,
AD-731 964

* * *

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HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION,
AD-733 257

* * *

AFOSR-TR-72-0196
3-D HOLOGRAM SYNTHESIS FROM 2-D PICTURES,
AD-736 057

* * *

AFOSR-TR-72-0372
MODERN OPTICS.
AD-737 521

* * *

AFOSR-TR-72-0473
TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.
AD-745 968

* * *

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AN EXPERIMENTAL INVESTIGATION OF THE VANDER LUGT MATCHED FILTER SYSTEM.
AD-746 710

* * *

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SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY,
AD-746 813

* * *

AFOSR-TR-72-1786
NONLINEARITIES OF PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIALS,
AD-749 118

*AIR FORCE ROCKET PROPULSION LAB EDWARDS AFB CALIF

* * *

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HOLOGRAPHY AS APPLIED TO JET BREAKUP AND AN ANALYTICAL METHOD FOR REDUCING HOLOGRAPHIC DROPLET DATA.
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* * *

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PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND

ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME II.
AD-736 128

* * *

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PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME I.
AD-736 127

*ALABAMA UNIV HUNTSVILLE DIV OF GRADUATE STUDIES AND RESEARCH

* * *

RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
AD-724 127

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SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY, (AFOSR-TR-72-1486)
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PATTERN THRESHOLD RECOGNITION DEVICE.
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* * *

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PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

* * *

ECOM-3494
CHARACTER IDENTIFICATION BY HOLOGRAPHY AND COHERENT SPATIAL FILTERING.
AD-737 182

*ARMY ENGINEER TOPOGRAPHIC LABS FORT BELVOIR VA

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STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
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* * *

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STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
AD-734 327

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HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII),
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INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.
AD-711 085

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INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.
AD-750 184

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HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
AD-713 545

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APPLICATIONS OF HOLOGRAPHY TO COMPONENT TESTING.
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HOLOGRAPHIC TESTING TECHNIQUES.
AD-726 369

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RESOLUTION LIMITS OF FRAUNHOFER HOLOGRAPHY.
AD-706 403

* * *

AEDC-TR-70-44
AERODYNAMIC HOLOGRAPHY.
AD-709 764

* * *

AEDC-TR-70-181
HOLOCAMERA FOR EXAMINATION OF WATER DROPLETS IN A LARGE HIGH ALTITUDE TEST CELL.
AD-715 916

* * *

AEDC-TR-71-137
A COMPARISON OF VARIOUS COHERENT OPTICAL FILTERING OPERATIONS.
AD-726 091

* * *

AEDC-TR-71-227
LASER INSTRUMENTATION IN AEDC TEST FACILITIES.
AD-733 740

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A HOLOGRAPHIC METHOD TO MEASURE SCINTILLATION EFFECTS.
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AD-513 724

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INTERIM TECHNICAL REPORT.
AD-513 812

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* * *

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HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE.
AD-725 159

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EDUCATIONAL TECHNOLOGY PROGRAM.
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AD-728 211

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HOLOGRAPHY AND ITS APPLICATIONS,
AD-747 380

* * *

FTD-HC-23-338-71
PROGRESS IN HOLOGRAPHY,
AD-733 204

* * *

FTD-HC-23-960-71
NEW POSSIBILITIES OF NON DESTRUCTIVE TESTING OF TIRES BY LASER HOLOGRAPHY. I. PRINCIPLE HOLOGRAPHY,
AD-734 916

* * *

FTD-HT-23-1288-71
SOME NEW APPLICATIONAL POSSIBILITIES OF HOLOGRAPH,
AD-742 710

* * *

FTD-MT-24-297-70
MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES),
AD-722 308

*FRANKLIN INST RESEARCH LABS PHILADELPHIA PA

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C-2231
CRITICAL THOUGHTS ON STRUCTURAL MECHANICS AND NDE,
(AFOSR-70-2870TR)
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MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS.
AD-744 072

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FIXING OF PHOTOPOLYMER HOLOGRAMS,
(AFOSR-TR-71-2441)
AD-730 269

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DATA RECORDING TECHNIQUE FEASIBILITY STUDY.
(RADC-TR-70-189)
AD-715 935

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AD-743 098

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S-391-1
REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
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APPLICATION OF CINEHOLOMICROGRAPHY TO THE STUDY OF MICROCIRCULATION HEMODYNAMICS.
AD-719 401

*LAVAL UNIV QUEBEC LABORATOIRE D'OPTIQUE ET HYPERFREQUENCES

* * *

RANDOM BIAS HOLOGRAMS,
AD-743 777

*LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF

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STATE OF THE ART AND PROSPECTS OF THE DEVELOPMENT OF HOLOGRAPHY,
AD-719 855

*LOCKHEED-GEORGIA CO MARIETTA

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AD-749 137

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME III. PROGRESS TOWARD A UNIFIED THEORY OF JET ENGINE NOISE.
(AFAPL-TR-72-53-VOL-3)
AD-749 138

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
(AFAPL-TR-72-53-VOL-4)
AD-749 139

* * *

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AD-749 140

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.
AD-749 141

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA.
AD-749 142

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.
(AFAPL-TR-72-53-VOL-6)
AD-749 143

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(AFAPL-TR-72-53-VOL-1)
AD-749 428

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(AFOSR-TR-71-2260)
AD-728 341

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DEVELOPMENT OF OPTIMAL SYSTEM PROPERTIES FOR PULSED CINEHOLOMICROSCOPY.
AD-734 148

*MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND TECHNOLOGY

* * *

2420-9-P
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-705 228

* * *

2420-21-P
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-718 386

* * *

24200-28-F
INVESTIGATION OF HOLOGRAPHIC

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AD-734 408

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72-10
PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
(ECOM-02411-25)
AD-740 228

*NATIONAL MATERIALS ADVISORY BOARD (NAS-NAE) WASHINGTON D C

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NMAB-288
TESTING FOR PREDICTION OF MATERIAL PERFORMANCE IN COMPONENTS AND STRUCTURES.
AD-743 991

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HOLOGRAPHIC DETERMINATION OF TRANSLATION AND ROTATION.
AD-710 365

* * *

THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF ASYMMETRIC THREE-DIMENSIONAL DENSITY FIELDS IN FREE JET FLOW.
AD-714 610

* * *

NPS-57C071111A
THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF THE FLOW FIELD AROUND A RIGHT CIRCULAR CONE AT ANGLE OF ATTACK.
AD-741 067

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ELECTROHYDRODYNAMICS (EHD) RESEARCH.
AD-734 977

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THERMOGRAPHIC TECHNIQUES FOR INSPECTION OF BABBITTED BEARINGS.
AD-745 730

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NSRDC-3680
HOLOGRAPHIC DISPLACEMENT MEASUREMENTS ON A HIGHLY SKEWED PROPELLER BLADE,
AD-738 820

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HOLOGRAPHIC APPLICATIONS IN STRESS ANALYSIS.
AD-721 115

*NAVAL TRAINING DEVICE CENTER ORLANDO FLA

* * *

NAVTRADEVCEN-TN-9
POLARIZATION EFFECTS IN HOLOGRAPHY.
AD-874 638

* * *

NAVTRADEVCEN-TN-11
AN INVESTIGATION OF HOLOGRAPHIC PARAMETERS.
AD-872 988

* * *

NAVTRADEVCEN-TN-20
HOLOGRAPHY.
AD-736 926

*NAVAL TRAINING EQUIPMENT CENTER ORLANDO FLA

* * *

NAVTRAEQUIPCEN-TN-25
THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY.
AD-750 250

*NAVAL UNDERSEA RESEARCH AND DEVELOPMENT CENTER SAN DIEGO CALIF

* * *

NUC-TP-239

VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER.
AD-735 459

*NAVAL UNDERWATER SYSTEMS CENTER NEWPORT R I

* * *

NUSC-TR-4353
APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY IN UNDERWATER ACOUSTICS RESEARCH.
AD-746 134

*NAVAL WEAPONS CENTER CHINA LAKE CALIF

* * *

NWC-TP-5388
A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS.
AD-746 859

*OFFICE OF NAVAL RESEARCH ARLINGTON VA

* * *

ONR-31
ELECTRONICS TECHNOLOGY IN JAPAN.
AD-742 074

*OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

* * *

EUROPEAN SCIENTIFIC NOTES. VOLUME 25, NUMBER 2.
AD-720 322

*OWENS-ILLINOIS INC TOLEDO OHIO CONSUMER AND TECHNICAL PRODUCTS DIV

* * *

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
AD-718 896

* * *

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
AD-728 467

*PERKIN-ELMER CORP NORWALK CONN OPTICAL GROUP

* * *

PE-ER-9725
INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING. (AMMRC-CR-70-14)
AD-711 085

* * *

PE-ER-10462
INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING. (AMMRC-CR-70-14(F))
AD-750 184

*PRATT AND WHITNEY AIRCRAFT EAST HARTFORD CONN

* * *

PWA-3942
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-870 186

* * *

PWA-4276
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-730 063

*PRINCETON UNIV N J DEPT OF ELECTRICAL ENGINEERING

* * *

A STUDY OF NETWORK AND SYSTEM SENSITIVITY OF SIGNAL PROCESSORS FOR USE IN AIR FORCE SYSTEMS SUCH AS COMMAND AND CONTROL SYSTEMS. (AFOSR-TR-71-2655)
AD-731 294

*PURDUE RESEARCH FOUNDATION LAFAYETTE IND

* * *

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING. (ETL-CR-70-8)
AD-718 084

* * *

STUDY OF POTENTIAL APPLICATION

OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
(ETL-CR-71-17)
AD-734 327

*RAND CORP SANTA MONICA CALIF

* * *

P-4394
HOLOGRAPHY IN A SPATIALLY INHOMOGENEOUS MEDIUM.
AD-708 911

*RCA ADVANCED TECHNOLOGY LABS BURLINGTON MASS

* * *

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
AD-745 025

* * *

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (GROUND SUPPORT EQUIPMENT).
AD-748 648

*RCA LABS PRINCETON N J

* * *

PHASE HOLOGRAPHIC STORAGE MEDIA FOR DISPLAY APPLICATIONS.
AD-885 331

*ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY

* * *

INVESTIGATIONS BY ANALYTIC AND THEORETICAL PROCEDURE OF VISIBILITY FUNCTIONS.
(AFCRL-70-0104)
AD-702 539

* * *

GENERALIZED FOURIER TECHNIQUES FOR THE THEORY OF LIGHT SCATTERING.
(AFCRL-71-0114)
AD-720 858

*ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

* * *

RADC-TR-70-69
OPTICAL SPATIAL FILTER ANALYSIS.
AD-871 156

* * *

RADC-TR-70-178
DIGITAL DATA RECORDING FOR HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR.
AD-715 983

* * *

RADC-TR-70-189
DATA RECORDING TECHNIQUE FEASIBILITY STUDY.
AD-715 935

*SHOCK AND VIBRATION INFORMATION CENTER (DEFENSE) WASHINGTON D C

* * *

THE SHOCK AND VIBRATION DIGEST.
VOLUME 2, NUMBER 5, MAY 1970.
AD-705 351

* * *

THE SHOCK AND VIBRATION DIGEST.
VOLUME 2, NUMBER 9, SEPTEMBER 1970.
AD-711 551

* * *

THE SHOCK AND VIBRATION DIGEST.
VOLUME 3, NUMBER 3, MARCH 1971.
AD-720 438

* * *

THE SHOCK AND VIBRATION DIGEST.
VOLUME 3, NUMBER 4, APRIL 1971.
AD-722 028

*SINGER-GENERAL PRECISION INC SUNNYVALE CALIF LINK DIV

* * *

UC-7240
DIGITAL DATA RECORDING FOR HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR.
(RADC-TR-70-178)
AD-715 983

*SOCIETY OF MOTION PICTURE AND TELEVISION ENGINEERS NEW YORK

* * *

PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON HIGH-SPEED PHOTOGRAPHY (9TH) HELD AT DENVER, COLORADO ON AUGUST 2-7 1970,
AD-729 287

*STANFORD UNIV CALIF STANFORD ELECTRONICS LABS

* * *

ACTION-ORIENTED MEMORY SUBSERVING PERCEPTION.
AD-714 510

* * *

SU-SEL-70-041
ANALOGY BETWEEN HOLOGRAPHY AND INTERFEROMETRIC IMAGE FORMATION.
AD-708 588

* * *

SU-SEL-72-006
INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS.
AD-742 349

* * *

TR-6415-1
ANALOGY BETWEEN HOLOGRAPHY AND INTERFEROMETRIC IMAGE FORMATION.
AD-708 588

* * *

TR-6418-1
INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS.
AD-742 349

*STATE UNIV OF NEW YORK STONY BROOK

* * *

A NEW HOLOGRAPHIC IMAGE DEBLURRING METHOD,
AD-719 050

* * *

HOLOGRAPHIC IMAGE DEBLURRING,
AD-719 055

* * *

ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
AD-719 056

*TECHNICAL OPERATIONS INC BURLINGTON MASS

* * *

TO-B-71-4
PERFORMANCE TESTING OF THE GROUND-BASED AND SNOWFLAKE DISDROMETER SYSTEMS.
(AFCRL-71-0164)
AD-722 452

*TEMPLE UNIV PHILADELPHIA PA DEPT OF PHYSICS

* * *

EXPERIMENTAL VERIFICATION AND VISUALIZATION OF CREEPING WAVES FOR ACOUSTIC SCATTERING BY RIGID BODIES IN AIR.
AD-704 159

*TENNESSEE UNIV SPACE INST TULLAHOMA

* * *

OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
(AFFDL-TR-69-100)
AD-703 299

*TEXAS UNIV AUSTIN ELECTRONICS RESEARCH CENTER

* * *

MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,
(AFOSR-70-2146TR)
AD-710 144

* * *

PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES,
(AFOSR-TR-71-2823)
AD-731 964

* * *

HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION,
(AFOSR-TR-71-2988)
AD-733 257

* * *

TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.
(AFOSR-TR-72-0473)
AD-745 968

* * *

TM-33
AN EXPERIMENTAL INVESTIGATION OF THE VANDER LUGT MATCHED FILTER SYSTEM.
(AFOSR-TR-72-1178)

AD-746 710

*TRW SYSTEMS REDONDO BEACH CALIF PHYSICAL RESEARCH CENTER

* * *

07966-6002-R000
ECOLOGICAL STUDIES OF MARINE PLANKTON.
AD-702 499

*TRW SYSTEMS GROUP REDONDO BEACH CALIF

* * *

HOLOGRAPHIC CHARACTERIZATION FOR CERAMICS. PART I.
AD-727 160

* * *

HOLOGRAPHIC CHARACTERIZATION OF CERAMICS. PART II. (OBSERVATION OF STATIC FATIGUE).
AD-729 699

* * *

AM-71-5
AN ANALYTICAL AND EXPERIMENTAL STUDY OF STRESSES IN TURBINE BLADES USING HOLOGRAPHIC INTERFEROMETRY.
AD-728 802

*TRW SYSTEMS GROUP REDONDO BEACH CALIF ADVANCED TECHNOLOGY STAFF GROUP

* * *

EXPERIMENTAL INVESTIGATION OF FRACTURE OF GRANITE UNDER COMPRESSION.
AD-738 050

*TRW SYSTEMS GROUP REDONDO BEACH CALIF APPLIED MECHANICS LAB

* * *

HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE.
(DASA-2608)
AD-725 159

*UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS

* * *

UACRL-J990798-13
INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS.
AD-702 420

*WASHINGTON UNIV ST LOUIS MO DEPT OF ELECTRICAL ENGINEERING

* * *

3-D HOLOGRAM SYNTHESIS FROM 2-D PICTURES,
(AFOSR-TR-72-0196)
AD-736 057

*WISCONSIN UNIV MILWAUKEE DEPT OF GEOLOGICAL SCIENCES

* * *

DEVELOPMENT OF CAPABILITIES OF OPTICAL DIFFRACTION ANALYSIS FOR QUANTITATIVELY COMPARING AND CORRELATING ROCK FABRICS AND FABRIC CHANGES.
AD-737 390

SUBJECT INDEX

TURBINE BLADE STRESS ANALYSIS.*
AD-702 420

*JAPAN
ELECTRONICS
ELECTRONICS TECHNOLOGY IN JAPAN,*
AD-742 074

*JET ENGINE NOISE
ACOUSTIC PROPERTIES
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS.*
AD-749 137
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME III. PROGRESS TOWARD A UNIFIED THEORY OF JET ENGINE NOISE.*
AD-749 138
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.*
AD-749 139
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V. AN EXPERIMENTAL INVESTIGATION OF JET NOISE VARIATION WITH VELOCITY AND TEMPERATURE.*
AD-749 140
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.*
AD-749 141
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA.*
AD-749 142
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.*
AD-749 143
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES.*
AD-749 428

*JET PLANE NOISE
SUPERSONIC PLANES
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS.*
AD-749 137
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME III. PROGRESS TOWARD A UNIFIED THEORY OF JET ENGINE NOISE.*
AD-749 138
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.*
AD-749 139
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V. AN EXPERIMENTAL INVESTIGATION OF JET NOISE VARIATION WITH VELOCITY AND TEMPERATURE.*
AD-749 140
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.*
AD-749 141
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA.*
AD-749 142
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER

AD-513 812

TELEVISION COMMUNICATION SYSTEMS
MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES)--TRANSLATION.
AD-722 308

*STEREOSCOPIC PHOTOGRAPHY
ATMOSPHERIC PRECIPITATION
PERFORMANCE TESTING OF THE GROUND-BASED AND SNOWFLAKE DISDROMETER SYSTEMS.*
AD-722 452

BLOOD CIRCULATION
APPLICATION OF CINEHOLOMICROGRAPHY TO THE STUDY OF MICROCIRCULATION HEMODYNAMICS.*
AD-719 401
DEVELOPMENT OF OPTIMAL SYSTEM PROPERTIES FOR PULSED CINEHOLOMICROSCOPY.*
AD-734 148

CONVECTION(HEAT TRANSFER)
HOLOGRAPHIC-INTERFEROMETER INVESTIGATION OF FREE-CONVECTION FROM A NON-UNIFORMLY-HEATED VERTICAL PLATE.*
AD-724 698

DEFORMATION
TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY.*
AD-725 748

FLOW VISUALIZATION
HOLOGRAPHIC APPLICATIONS IN SHADOWGRAPH, SCHLIEREN, AND INTERFEROMETRY ANALYSES OF HEAT TRANSFER AND FLUID FLOW TEST SUBJECTS,*
AD-717 702
THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF THE FLOW FIELD AROUND A RIGHT CIRCULAR CONE AT ANGLE OF ATTACK.*
AD-741 067

INTERFEROMETERS
INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS.*
AD-702 420

LASERS
OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.*
AD-703 299
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.*
AD-705 228
MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,*
AD-710 144
HOLOGRAPHIC DETERMINATION OF TRANSLATION AND ROTATION.*
AD-710 365
DEVELOPMENT AND APPLICATION OF METHODS OF EXPERIMENTAL MECHANICS. INTERPRETATION OF FRINGES IN STRESS-HOLO-INTERFEROMETRY.*
AD-712 869
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.*
AD-718 386
STATE OF THE ART AND PROSPECTS OF THE DEVELOPMENT OF HOLOGRAPHY--TRANSLATION.
AD-719 855
A TECHNIQUE FOR OBTAINING IMPROVED REAL-TIME HOLOGRAPHIC INTERFEROMETRIC DATA USING PULSE MODULATED ILLUMINATION.*
AD-723 632
PROGRESS IN HOLOGRAPHY--TRANSLATION.
AD-733 204
MODERN OPTICS.*
AD-737 521
AN INVESTIGATION OF HOLOGRAPHIC PARAMETERS.*
AD-872 988
POLARIZATION EFFECTS IN HOLOGRAPHY.*

*UNDERWATER PHOTOGRAPHY
RESOLUTION
HOLOGRAPHY IN A SPATIALLY INHOMOGENEOUS MEDIUM,*
AD-708 911

*UNDERWATER SOUND
OPTICAL IMAGES
UNDERWATER VIEWING SYSTEM USING SOUND HOLOGRAPHY.*
AD-740 836

*VIBRATION
NAVAL RESEARCH
THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 5, MAY 1970.*
AD-705 351
THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 9, SEPTEMBER 1970.*
AD-711 551
THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 3, MARCH 1971.*
AD-720 438
THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 4, APRIL 1971.*
AD-722 028

TITLE INDEX

INTERPRETATION OF FRINGES IN STRESS-HOLO-INTERFEROMETRY.(U)
*STRESSES

DEVELOPMENT OF CAPABILITIES OF OPTICAL DIFFRACTION ANALYSIS FOR QUANTITATIVELY COMPARING AND CORRELATING ROCK FABRICS AND FABRIC CHANGES.(U) AD-737 390
*ROCK(GEOLOGY)

DEVELOPMENT OF OPTIMAL SYSTEM PROPERTIES FOR PULSED CINEHOLOMICROSCOPY.(U) AD-734 148
*MICROSCOPY

DIGITAL DATA RECORDING FOR HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR.(U) AD-715 983
*DATA STORAGE SYSTEMS

ECOLOGICAL STUDIES OF MARINE PLANKTON.(U) AD-702 499
*ECOLOGY

EDUCATIONAL TECHNOLOGY PROGRAM.(U) AD-714 563
*TEACHING METHODS

EDUCATIONAL TECHNOLOGY PROGRAM.(U) AD-718 101
*TEACHING MACHINES

EDUCATIONAL TECHNOLOGY PROGRAM.(U) AD-728 211
*TEACHING MACHINES

ELECTROHYDRODYNAMICS (EHD) RESEARCH.(U) AD-734 977
*PLASMA MEDIUM

ELECTRONICS TECHNOLOGY IN JAPAN,(U) AD-742 074
*ELECTRONICS

ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,(U) AD-719 056
*PHOTOGRAPHIC IMAGES

EUROPEAN SCIENTIFIC NOTES. VOLUME 25, NUMBER 2,(U) AD-720 322
*SCIENTIFIC RESEARCH

EXPERIMENTAL INVESTIGATION OF FRACTURE OF GRANITE UNDER COMPRESSION.(U) AD-738 050
*GRANITE

AN EXPERIMENTAL INVESTIGATION OF THE VANDER LUGT MATCHED FILTER SYSTEM.(U) AD-746 710
*READING MACHINES

EXPERIMENTAL VERIFICATION AND VISUALIZATION OF CREEPING WAVES FOR ACOUSTIC SCATTERING BY RIGID BODIES IN AIR.(U) AD-704 159
*SOUND

FIXING OF PHOTOPOLYMER HOLOGRAMS,(U) AD-730 269
*PHOTOGRAPHIC RECORDING SYSTEMS

FOG DROP-SIZE DISTRIBUTIONS MEASURED WITH A LASER HOLOGRAM CAMERA,(U) AD-731 087
*FOG

FULL VIEW HOLOGRAMS,(U) AD-716 276
*STEREOSCOPIC PHOTOGRAPHY

GENERALIZED FOURIER TECHNIQUES FOR THE THEORY OF LIGHT SCATTERING.(U) AD-720 858
*LIGHT TRANSMISSION

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES.(U) AD-749 428
*JET ENGINE NOISE

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS.(U) AD-749 137
*JET ENGINE NOISE

INTERFEROMETRIC FRINGE ANALYSIS AND MEASUREMENTS OF CONTROLLED SURFACE DISPLACEMENTS.(U)
*STEREOSCOPIC PHOTOGRAPHY

HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII),(U) AD-746 646
*STEREOSCOPIC PHOTOGRAPHY

A HOLOGRAPHIC METHOD TO MEASURE SCINTILLATION EFFECTS.(U) AD-726 902
*LIGHT TRANSMISSION

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (GROUND SUPPORT EQUIPMENT).(U) AD-748 648
*STEREOSCOPIC DISPLAY SYSTEMS

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).(U) AD-745 025
*STEREOSCOPIC DISPLAY SYSTEMS

A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS.(U) AD-746 859
*STEREOSCOPIC DISPLAY SYSTEMS

HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE.(U) AD-725 159
*GRANITE

HOLOGRAPHIC TESTING TECHNIQUES.(U) AD-726 369
*NON-DESTRUCTIVE TESTING

HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,(U) AD-708 641
*LIQUIDS

HOLOGRAPHY AND ITS APPLICATIONS,(U) AD-747 380
*STEREOSCOPIC PHOTOGRAPHY

HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION,(U) AD-733 257
*DATA PROCESSING SYSTEMS

HOLOGRAPHY AS APPLIED TO JET BREAKUP AND AN ANALYTICAL METHOD FOR REDUCING HOLOGRAPHIC DROPLET DATA.(U) AD-749 854
*SUPERSONIC FLOW

HOLOGRAPHY IN A SPATIALLY INHOMOGENEOUS MEDIUM,(U) AD-708 911
*RESOLUTION

HOLOGRAPHY.(U) AD-736 926
*STEREOSCOPIC PHOTOGRAPHY

THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER,(U) AD-728 341
*INTERFEROMETERS

INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS.(U) AD-742 349
*OPTICAL FILTERS

INTERIM TECHNICAL REPORT.(U) AD-513 812
*STEREOSCOPIC DISPLAY SYSTEMS

INVESTIGATION OF A CLASS OF ELECTROMAGNETIC BOUNDARY VALUE PROBLEMS.(U) AD-707 845
*ELECTROMAGNETIC WAVES

INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS.(U) AD-702 420
*TURBINE BLADES

AN INVESTIGATION OF HOLOGRAPHIC PARAMETERS.(U) AD-872 988
*STEREOSCOPIC PHOTOGRAPHY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.(U) AD-705 228
*STEREOSCOPIC PHOTOGRAPHY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.(U) AD-718 386
*STEREOSCOPIC PHOTOGRAPHY

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.(U) AD-734 408
*NON-DESTRUCTIVE TESTING

INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.(U) AD-711 085
*NON-DESTRUCTIVE TESTING

INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.(U) AD-750 184
*NON-DESTRUCTIVE TESTING

INVESTIGATIONS BY ANALYTIC AND THEORETICAL PROCEDURE OF VISIBILITY FUNCTIONS.(U) AD-702 539
*COHERENT RADIATION

LASER INSTRUMENTATION IN AEDC TEST FACILITIES.(U) AD-733 740
*TEST FACILITIES

LASER TECHNOLOGY IN AERODYNAMIC MEASUREMENTS.(U) AD-742 619
*AERODYNAMICS

LIQUID CRYSTAL DISPLAYS FOR MATCHED FILTERING,(U) AD-717 170
*DATA PROCESSING SYSTEMS

MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS.(U) AD-744 072
*NON-DESTRUCTIVE TESTING

MODERN OPTICS.(U) AD-717 775
*LASERS

MODERN OPTICS.(U) AD-737 521
*LASERS

MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES),(U) AD-722 308
*TELEVISION COMMUNICATION SYSTEMS

MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,(U) AD-710 144
*STEREOSCOPIC PHOTOGRAPHY

A NEW HOLOGRAPHIC IMAGE DEBLURRING METHOD,(U) AD-719 050
*PHOTOGRAPHIC IMAGES

NEW POSSIBILITIES OF NON DESTRUCTIVE TESTING OF TIRES BY LASER HOLOGRAPHY. I. PRINCIPLE HOLOGRAPHY,(U) AD-734 916
*TIRES

NONLINEARITIES OF PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIALS,(U) AD-749 118
*STEREOSCOPIC PHOTOGRAPHY

OPERATION MANUAL: HOLOGRAPHIC UNDERWATER VIEWING SYSTEM.(U) AD-513 724
*ACOUSTIC DETECTORS

OPTICAL METHODS FOR CONDUCTING NONDESTRUCTIVE TESTING OF FUEL FILTER ELEMENTS.(U) AD-731 237
*FUEL FILTERS

OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.(U) AD-703 299
*FLUID FLOW

OPTICAL SPATIAL FILTER ANALYSIS.(U) AD-871 156
*OPTICAL IMAGES

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.(U) AD-730 063
*FLOW VISUALIZATION

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT AD-870 186

UNDERGROUND VIEWING.(U)
*STRUCTURAL GEOLOGY

THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 5, MAY 1970.(U) AD-705 351
*SHOCK(MECHANICS)

THE SHOCK AND VIBRATION DIGEST. VOLUME 2, NUMBER 9, SEPTEMBER 1970.(U) AD-711 551
*SHOCK(MECHANICS)

THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 3, MARCH 1971.(U) AD-720 438
*SHOCK(MECHANICS)

THE SHOCK AND VIBRATION DIGEST. VOLUME 3, NUMBER 4, APRIL 1971.(U) AD-722 028
*SHOCK(MECHANICS)

SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY.(U) AD-746 813
*STEREOSCOPIC PHOTOGRAPHY

SOME NEW APPLICATIONAL POSSIBILITIES OF HOLOGRAPH.(U) AD-742 710
*STEREOSCOPIC PHOTOGRAPHY

STATE OF THE ART AND PROSPECTS OF THE DEVELOPMENT OF HOLOGRAPHY.(U) AD-719 855
*STEREOSCOPIC PHOTOGRAPHY

A STUDY OF NETWORK AND SYSTEM SENSITIVITY OF SIGNAL PROCESSORS FOR USE IN AIR FORCE SYSTEMS SUCH AS COMMAND AND CONTROL SYSTEMS.(U) AD-731 294
*INFORMATION THEORY

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.(U) AD-718 084
*PHOTOGRAMMETRY

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.(U) AD-734 327
*PHOTOGRAMMETRY

A TECHNIQUE FOR OBTAINING IMPROVED REAL-TIME HOLOGRAPHIC INTERFEROMETRIC DATA USING PULSE MODULATED ILLUMINATION.(U) AD-723 632
*STEREOSCOPIC PHOTOGRAPHY

TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY.(U) AD-725 748
*STRUCTURAL SHELLS

TESTING FOR PREDICTION OF MATERIAL PERFORMANCE IN COMPONENTS AND STRUCTURES.(U) AD-743 991
*RELIABILITY

TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.(U) AD-745 968
*ELECTRONICS

THERMOGRAPHIC TECHNIQUES FOR INSPECTION OF BABBITTED BEARINGS.(U) AD-745 730
*JOURNAL BEARINGS

THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY.(U) AD-750 250
*STEREOSCOPIC PHOTOGRAPHY

UNDERWATER VIEWING SYSTEM USING SOUND HOLOGRAPHY.(U) AD-740 836
*SONAR EQUIPMENT

VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER.(U) AD-735 459
*SONAR PROJECTORS

PERSONAL AUTHOR INDEX

HOLOGRAPHIC TESTING TECHNIQUES.
AD-726 369

*ARSENAULT, H. H.
* * *
RANDOM BIAS HOLOGRAMS,
AD-743 777

*BAKER, LARRY M.
* * *
HOLOGRAPHIC-INTERFEROMETER INVESTIGATION OF FREE-CONVECTION FROM A NON-UNIFORMLY-HEATED VERTICAL PLATE.
AD-724 698

*BALASUBRAMANIAN, N.
* * *
STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
AD-734 327

*BANOS, ALFREDO, JR
* * *
EUROPEAN SCIENTIFIC NOTES. VOLUME 25, NUMBER 2,
AD-720 322

*BARACH, D.
* * *
VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER.
AD-735 459

*BECSEY, JULIUS G.
* * *
HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,
AD-708 641
* * *
HOLOGRAM INTERFEROMETRY FOR ISOTHERMAL DIFFUSION MEASUREMENTS.
AD-736 641

*BEISEL, GEORGE E.
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.
AD-749 143

*BELZ, RONALD A.
* * *
RESOLUTION LIMITS OF FRAUNHOFER HOLOGRAPHY.
AD-706 403

*BIBLARZ, OSCAR
* * *
ELECTROHYDRODYNAMICS (EHD) RESEARCH.
AD-734 977

*BIERLEIN, JAMES A.
* * *
HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,
AD-708 641
* * *
HOLOGRAM INTERFEROMETRY FOR ISOTHERMAL DIFFUSION MEASUREMENTS.
AD-736 641

*BOARDMAN, JOHN
* * *
PERFORMANCE TESTING OF THE GROUND-BASED AND SNOWFLAKE DISDROMETER SYSTEMS.
AD-722 452

*BOHN, JACK R.
* * *
HOLOGRAPHIC CHARACTERIZATION FOR CERAMICS. PART I.
AD-727 160
* * *
HOLOGRAPHIC CHARACTERIZATION OF CERAMICS. PART II. (OBSERVATION OF STATIC FATIGUE).
AD-729 699

*BOLING, N. L.
* * *
DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.

AD-718 896

* * *

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
AD-728 467

*BONDARENKO, M. D.

* * *

HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII),
AD-746 646

*BORDOGNA, J.

* * *

PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

*BRAULT, R. G.

* * *

RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
AD-703 984

*BREGLIA, DENIS R.

* * *

HOLOGRAPHY.
AD-736 926

* * *

THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY.
AD-750 250

*BRESCIA, NICHOLAS, JR

* * *

THERMOGRAPHIC TECHNIQUES FOR INSPECTION OF BABBITTED BEARINGS.
AD-745 730

*BURGESS, K. S.

* * *

HOLOCAMERA FOR EXAMINATION OF WATER DROPLETS IN A LARGE HIGH ALTITUDE TEST CELL.
AD-715 916

*BURR, RONALD J.

* * *

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-730 063

* * *

OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-870 186

*BURRIN, ROBERT H.

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS.
AD-749 137

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V. AN EXPERIMENTAL INVESTIGATION OF JET NOISE VARIATION WITH VELOCITY AND TEMPERATURE.
AD-749 140

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.
AD-749 141

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA.
AD-749 142

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER

INTERFEROMETER.
AD-749 143

*BURTON, GARDNER T.
* * *
HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
AD-745 025

*CASE, KENNETH
* * *
REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
AD-743 098

*CAVANAUGH, LAWRENCE A.
* * *
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-730 063
* * *
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-870 186

*CHACE, WILLIAM G.
* * *
PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON HIGH-SPEED PHOTOGRAPHY (9TH) HELD AT DENVER, COLORADO ON AUGUST 2-7 1970,
AD-729 287

*CHANG, WILLIAM S. C.
* * *
3-D HOLOGRAM SYNTHESIS FROM 2-D PICTURES,
AD-736 057

*CLAY, BURTON R.
* * *
HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
AD-745 025

*CODY, ROBERT LEE
* * *
A COMPARISON OF VARIOUS COHERENT OPTICAL FILTERING OPERATIONS.
AD-726 091

*COLLINS, DANIEL J.
* * *
THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF THE FLOW FIELD AROUND A RIGHT CIRCULAR CONE AT ANGLE OF ATTACK.
AD-741 067

*CONSTANTINOU, GEORGE
* * *
CHARACTER IDENTIFICATION BY HOLOGRAPHY AND COHERENT SPATIAL FILTERING.
AD-737 182

*CORWIN, RICHARD R.
* * *
TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY.
AD-725 748

*COX, MARY E.
* * *
DEVELOPMENT OF OPTIMAL SYSTEM PROPERTIES FOR PULSED CINEHOLOMICROSCOPY.
AD-734 148

*DASHEN, ROGER
* * *
REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
AD-743 098

*DEITZ, PAUL H.
* * *
A HOLOGRAPHIC METHOD TO MEASURE SCINTILLATION EFFECTS.
AD-726 902

*DEV, PARVATI
* * *
ACTION-ORIENTED MEMORY SUBSERVING

PERCEPTION.
AD-714 510

*DHIR, SURENDRA K.
* * *
HOLOGRAPHIC APPLICATIONS IN STRESS ANALYSIS.
AD-721 115
* * *
HOLOGRAPHIC DISPLACEMENT MEASUREMENTS ON A HIGHLY SKEWED PROPELLER BLADE,
AD-738 820

*DICKEY, JOE
* * *
THERMOGRAPHIC TECHNIQUES FOR INSPECTION OF BABBITTED BEARINGS.
AD-745 730

*DIDDAY, RICHARD L.
* * *
ACTION-ORIENTED MEMORY SUBSERVING PERCEPTION.
AD-714 510

*DOAK, PHILIP E.
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME III. PROGRESS TOWARD A UNIFIED THEORY OF JET ENGINE NOISE.
AD-749 138
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
AD-749 139
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES.
AD-749 428

*DOUGAL, ARWIN A.
* * *
MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,
AD-710 144
* * *
PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES,
AD-731 964
* * *
HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION,
AD-733 257
* * *
TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.
AD-745 968
* * *
AN EXPERIMENTAL INVESTIGATION OF THE VANDER LUGT MATCHED FILTER SYSTEM.
AD-746 710

*DUGGAN, JOHN B.
* * *
RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
AD-724 127

*DURELLI, A. J.
* * *
DEVELOPMENT AND APPLICATION OF METHODS OF EXPERIMENTAL MECHANICS. INTERPRETATION OF FRINGES IN STRESS-HOLO-INTERFEROMETRY.
AD-712 869

*DURHAM, JOSEPH E.
* * *
RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
AD-724 127

*ENGELDRUM, PETER G.
* * *
DATA RECORDING TECHNIQUE FEASIBILITY STUDY.

AD-715 935

*ERF, R. K.
* * *
INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS.
AD-702 420

*EVANS, JOHN M.
* * *
A HOLOGRAPHIC METHOD TO MEASURE SCINTILLATION EFFECTS.
AD-726 902

*EVENSON, D. A.
* * *
AN ANALYTICAL AND EXPERIMENTAL STUDY OF STRESSES IN TURBINE BLADES USING HOLOGRAPHIC INTERFEROMETRY.
AD-728 802

*EVINS, D. J.
* * *
ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
AD-719 056

*FARHAT, NABIL H.
* * *
PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

*FARMER, W. M.
* * *
HOLOCAMERA FOR EXAMINATION OF WATER DROPLETS IN A LARGE HIGH ALTITUDE TEST CELL.
AD-715 916

*FISHER, MICHAEL J.
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.
AD-749 143

*FITZPATRICK, GERALD L.
* * *
SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING.
AD-734 693

*FLOYD, RICHARD PAUL
* * *
HOLOGRAPHIC DETERMINATION OF TRANSLATION AND ROTATION.
AD-710 365

*FRANCIS, DAVID G.
* * *
LASER INSTRUMENTATION IN AEDC TEST FACILITIES.
AD-733 740

*FRICK, FREDERICK C.
* * *
EDUCATIONAL TECHNOLOGY PROGRAM.
AD-714 563
* * *
EDUCATIONAL TECHNOLOGY PROGRAM.
AD-718 101
* * *
EDUCATIONAL TECHNOLOGY PROGRAM.
AD-728 211

*FRIEDRICH, O. M., JR
* * *
TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.
AD-745 968

*FRIEDRICH, OTTO, JR
* * *
PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES,
AD-731 964

*FRIEDRICH, OTTO M., JR
* * *
MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER

SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,
AD-710 144

* * *

HOLOGRAPHY AND OPTICAL DATA PROCESSING IN AEROSPACE INSTRUMENTATION,
AD-733 257

*FROMAN, JAY

* * *

ELECTRONICS TECHNOLOGY IN JAPAN,
AD-742 074

*GARDNER, L. B.

* * *

HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
AD-713 545

*GEORGE, DAWEEL J.

* * *

HOLOGRAPHY AS APPLIED TO JET BREAKUP AND AN ANALYTICAL METHOD FOR REDUCING HOLOGRAPHIC DROPLET DATA.
AD-749 854

*GEORGE, NICHOLAS

* * *

FULL VIEW HOLOGRAMS,
AD-716 276

* * *

REFLECTION-TRANSMISSION FULL-VIEW HOLOGRAMS,
AD-716 571

* * *

MODERN OPTICS.
AD-717 775

* * *

MODERN OPTICS.
AD-737 521

*GLASER, GARY H.

* * *

STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
AD-718 084

*GNATOVSKII, A. V.

* * *

HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII),
AD-746 646

*GOODMAN, J. W.

* * *

ANALOGY BETWEEN HOLOGRAPHY AND INTERFEROMETRIC IMAGE FORMATION.
AD-708 588

* * *

INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS.
AD-742 349

*GORE, DOUGLAS A.

* * *

HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
AD-745 025

*GOUD, R.

* * *

PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

*GUARD, W. R.

* * *

PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

*HALIOUA, M.

* * *

A NEW HOLOGRAPHIC IMAGE DEBLURRING METHOD,
AD-719 050

* * *

ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
AD-719 056

*HARBOLD, MARY L.
* * *
EXPERIMENTAL VERIFICATION AND VISUALIZATION OF CREEPING WAVES FOR ACOUSTIC SCATTERING BY RIGID BODIES IN AIR.
AD-704 159

*HAUER, ALLAN
* * *
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-730 063
* * *
OPTICAL TECHNIQUES FOR FLOW VISUALIZATION AND FLOW FIELD MEASUREMENTS IN AIRCRAFT TURBOMACHINERY.
AD-870 186

*HAVENER, A. G.
* * *
HOLOGRAPHIC APPLICATIONS IN SHADOWGRAPH, SCHLIEREN, AND INTERFEROMETRY ANALYSES OF HEAT TRANSFER AND FLUID FLOW TEST SUBJECTS,
AD-717 702

*HAYWARD, R. A.
* * *
MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS.
AD-744 072

*HAZELTON, L. R., JR
* * *
THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER,
AD-728 341

*HEIFNER, ROY L.
* * *
OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
AD-703 299

*HEWITSON, VICTORIA S.
* * *
EUROPEAN SCIENTIFIC NOTES. VOLUME 25, NUMBER 2,
AD-720 322

*HIRSCHBERG, J. G.
* * *
THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER,
AD-728 341

*HOFMEISTER, L. D.
* * *
AN ANALYTICAL AND EXPERIMENTAL STUDY OF STRESSES IN TURBINE BLADES USING HOLOGRAPHIC INTERFEROMETRY.
AD-728 802

*HOLLEY, THURSTON C.
* * *
COHERENCE PROPERTIES OF A PULSED RUBY LASER.
AD-874 649

*HUNT, J. T.
* * *
VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER.
AD-735 459

*HUNTER, R. W.
* * *
PATTERN THRESHOLD RECOGNITION DEVICE.
AD-721 021

*HUNTER, ROGER W.
* * *
PATTERN THRESHOLD RECOGNITION DEVICE.
AD-712 324

*HYZER, WILLIAM G.
* * *
PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON HIGH-SPEED PHOTOGRAPHY (9TH) HELD AT DENVER, COLORADO ON AUGUST 2-7 1970,
AD-729 287

*IVERSEN, R. J.
* * *

APPLICATIONS OF HOLOGRAPHY TO COMPONENT TESTING.
AD-709 603

* * *

HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
AD-713 545

*IVERSEN, ROBERT J.

* * *

HOLOGRAPHIC TESTING TECHNIQUES.
AD-726 369

*JACKSON, NATHANIEL R.

* * *

HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,
AD-708 641

* * *

HOLOGRAM INTERFEROMETRY FOR ISOTHERMAL DIFFUSION MEASUREMENTS.
AD-736 641

*JACOBY, JEROLD J.

* * *

HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE.
AD-725 159

*JAGOTA, RAVI C.

* * *

THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF THE FLOW FIELD AROUND A RIGHT CIRCULAR CONE AT ANGLE OF ATTACK.
AD-741 067

*JASTRZEMBSKI, J.

* * *

PENNSYLVANIA-PRINCETON ARMY AVIONICS RESEARCH PROGRAM. MILLIMETER WAVE IMAGE CONVERSION TASK.
AD-740 228

*JENNEY, J. A.

* * *

RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
AD-703 984

* * *

NONLINEARITIES OF PHOTOPOLYMER HOLOGRAPHIC RECORDING MATERIALS,
AD-749 118

*JENNEY, JOE A.

* * *

FIXING OF PHOTOPOLYMER HOLOGRAMS,
AD-730 269

*JOHNSON, C.

* * *

VIBRATIONAL ANALYSIS OF THE FLEXING HEAD OF THE BQS-6 TRANSDUCER.
AD-735 459

*JOHNSON, CAMERON D.

* * *

APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY IN UNDERWATER ACOUSTICS RESEARCH.
AD-746 134

*KAMM, H. W.

* * *

A REVIEW OF NONDESTRUCTIVE METHODS FOR THE DETECTION OF CONCEALED CRACKS.
AD-746 268

*KARCZEWSKI, BOHDAN

* * *

HOLOGRAPHY AND ITS APPLICATIONS,
AD-747 380

*KEATING, P. N.

* * *

UNDERWATER VIEWING SYSTEM USING SOUND HOLOGRAPHY.
AD-740 836

*KERR, ROBERT L.

* * *

DETERMINATION OF SILVER PERCHLORATE DIFFUSION COEFFICIENT BY HOLOGRAPHIC INTERFEROMETRY.
AD-743 310

*KOPPELMANN, R.

* * *

UNDERWATER VIEWING SYSTEM USING

SOUND HOLOGRAPHY.
AD-740 836

*KOPPELMANN, ROGER F.
* * *
OPERATION MANUAL: HOLOGRAPHIC UNDERWATER VIEWING SYSTEM.
AD-513 724

*KRASKA, I. R.
* * *
A REVIEW OF NONDESTRUCTIVE METHODS FOR THE DETECTION OF CONCEALED CRACKS.
AD-746 268

*KREUZER, JUSTIN L.
* * *
INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.
AD-711 085
* * *
INVESTIGATION OF THE APPLICATION OF COHERENT ACOUSTIC IMAGING TO NONDESTRUCTIVE TESTING.
AD-750 184

*KROLL, NORMAL
* * *
REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
AD-743 098

*KUNKEL, BRUCE A.
* * *
FOG DROP-SIZE DISTRIBUTIONS MEASURED WITH A LASER HOLOGRAM CAMERA,
AD-731 087

*KURTZ, MAURICE K., JR
* * *
STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
AD-734 327

*LAINIOTIS, D. G.
* * *
TEXAS BIANNUAL OF ELECTRONICS RESEARCH NUMBER 14.
AD-745 968

*LEITH, E. N.
* * *
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-734 408

*LEITH, EMMETT N.
* * *
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-705 228
* * *
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-718 386

*LILLEY, GEOFFREY M.
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
AD-749 139

*LUSH, PETER A.
* * *
THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V. AN EXPERIMENTAL INVESTIGATION OF JET NOISE VARIATION WITH VELOCITY AND TEMPERATURE.
AD-749 140
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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.
AD-749 141
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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX II. SHOCK ASSOCIATED NOISE DATA.
AD-749 142

*MACANALLY, RICHARD B.

* * *

LIQUID CRYSTAL DISPLAYS FOR MATCHED FILTERING,
AD-717 170

* * *

MODERN OPTICS.
AD-737 521

*MADDUX, GENE E.

* * *

HOLOGRAPHY AND HOLOGRAPHIC INTERFEROMETRY FOR THERMAL DIFFUSION STUDIES IN SOLUTIONS,
AD-708 641

* * *

A TECHNIQUE FOR OBTAINING IMPROVED REAL-TIME HOLOGRAPHIC INTERFEROMETRIC DATA USING PULSE MODULATED ILLUMINATION.
AD-723 632

* * *

TECHNIQUES FOR MEASURING DISPLACEMENT FIELDS OF DEFORMED BODIES USING HOLOGRAPHIC INTERFEROMETRY.
AD-725 748

*MARGERUM, J. D.

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RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
AD-703 984

*MARSHALL, LARRY

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RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
AD-724 127

*MARTEL, CHARLES R.

* * *

OPTICAL METHODS FOR CONDUCTING NONDESTRUCTIVE TESTING OF FUEL FILTER ELEMENTS.
AD-731 237

*MATULKA, ROBERT DALE

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THE APPLICATION OF HOLOGRAPHIC INTERFEROMETRY TO THE DETERMINATION OF ASYMMETRIC THREE-DIMENSIONAL DENSITY FIELDS IN FREE JET FLOW.
AD-714 610

*MAYER, GERALD M.

* * *

APPLICATIONS OF HOLOGRAPHIC INTERFEROMETRY IN UNDERWATER ACOUSTICS RESEARCH.
AD-746 134

*MAYO, WILLIAM T.

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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.
AD-749 143

*MCCAULEY, D. G.

* * *

A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS.
AD-746 859

*MCCLUNEY, W. R.

* * *

THE HOMIN, A HOLOGRAPHIC MULTIPASS INTERFEROMETER,
AD-728 341

*MCGARVEY, J. W.

* * *

APPLICATIONS OF HOLOGRAPHY TO COMPONENT TESTING.
AD-709 603

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HOLOGRAPHIC INSPECTION OF LAMINATE BONDS,
AD-713 545

*MEADOWS, DONALD M.

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME VI. JET FLOW MEASUREMENT AND ANALYSIS WITH SPECIAL EMPHASIS ON REMOTE

SENSING DEVICES. CROSSED BEAM SCHLIEREN, LASER DOPPLER VELOCIMETER, PULSED LASER INTERFEROMETER.
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*MENZEL, REINHARD W.
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OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
AD-703 299

*MIKAELYAN, A. L.
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STATE OF THE ART AND PROSPECTS OF THE DEVELOPMENT OF HOLOGRAPHY,
AD-719 855

*MIKHAIL, EDWARD M.
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STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
AD-718 084
* * *
STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
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*MILLER, L. J.
* * *
RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
AD-703 984

*MITTRA, RAJ
* * *
INVESTIGATION OF A CLASS OF ELECTROMAGNETIC BOUNDARY VALUE PROBLEMS.
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*MOHON, WINDELL N.
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HOLOGRAPHY.
AD-736 926
* * *
THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY.
AD-750 250
* * *
POLARIZATION EFFECTS IN HOLOGRAPHY.
AD-874 638

*MOHR, S. H.
* * *
ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
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*MONFETTE, PHILLIP
* * *
RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
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*MONTUORI, JOHN S.
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DATA RECORDING TECHNIQUE FEASIBILITY STUDY.
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*MURBACH, W. J.
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A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS.
AD-746 859

*O'HARE, J. E.
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AERODYNAMIC HOLOGRAPHY.
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*O'KEEFE, JOHN D.
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HOLOGRAPHIC STUDY OF WAVE PROPAGATION IN GRANITE.
AD-725 159
* * *
EXPERIMENTAL INVESTIGATION OF FRACTURE OF GRANITE UNDER COMPRESSION.
AD-738 050

*OVEROYE, K. R.
* * *
AN ANALYTICAL AND EXPERIMENTAL STUDY OF STRESSES IN TURBINE BLADES USING HOLOGRAPHIC INTERFEROMETRY.
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*OVEROYE, KENNETH R.

* * *

EXPERIMENTAL INVESTIGATION OF FRACTURE OF GRANITE UNDER COMPRESSION.
AD-738 050

*PALAIS, J. C.

* * *

SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY,
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*PANKHURST, R. C.

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LASER TECHNOLOGY IN AERODYNAMIC MEASUREMENTS.
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*PEARSON, DURK J.

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HOLOGRAPHIC CHARACTERIZATION FOR CERAMICS. PART I.
AD-727 160

*PENDLETON, WINSTON KENT, III

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DETERMINATION OF SPATIAL AND TEMPORAL ELECTRON DENSITY AND TEMPORAL ELECTRON TEMPERATURE IN LASER-PRODUCED GASEOUS DEUTERIUM PLASMAS.
AD-734 246

*PERRETTA, LOUIS A.

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HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
AD-745 025

*PETERSON, HERBERT A.

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HOLOGRAPHIC APPLICATIONS IN STRESS ANALYSIS.
AD-721 115

*PHILLIPS, WILLIAM

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PHASE HOLOGRAPHIC STORAGE MEDIA FOR DISPLAY APPLICATIONS.
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*PINCUS, HOWARD J.

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DEVELOPMENT OF CAPABILITIES OF OPTICAL DIFFRACTION ANALYSIS FOR QUANTITATIVELY COMPARING AND CORRELATING ROCK FABRICS AND FABRIC CHANGES.
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*PLUMBLEE, HARRY E.

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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME II. FUTURE STUDIES FOR DEFINITION OF SUPERSONIC JET NOISE GENERATION AND REDUCTION MECHANISMS.
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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME I. SUMMARY OF SUPERSONIC JET NOISE STUDIES.
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*POLCYN, ROGER F.

* * *

AN INVESTIGATION OF HOLOGRAPHIC PARAMETERS.
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*RAPOPORT, B. I.

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MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES),
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*RATNER, GEORGE H.

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HOLOGRAPHIC INTERFEROMETRIC FRINGE ANALYSIS AND MEASUREMENTS OF CONTROLLED SURFACE DISPLACEMENTS.
AD-874 653

*REICHMANN, S.
* * *
SOME NEW APPLICATIONAL POSSIBILITIES OF HOLOGRAPH,
AD-742 710

*RIBBENS, W. R.
* * *
INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
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*RODEMANN, ALFRED H.
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HOLOGRAPHY.
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THREE HUNDRED AND SIXTY DEGREE HOLOGRAPHY.
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POLARIZATION EFFECTS IN HOLOGRAPHY.
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MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS.
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OPTICAL METHODS FOR CONDUCTING NONDESTRUCTIVE TESTING OF FUEL FILTER ELEMENTS.
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*ROSZHART, TERRY V.
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HOLOGRAPHIC CHARACTERIZATION FOR CERAMICS. PART I.
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HOLOGRAPHIC CHARACTERIZATION OF CERAMICS. PART II. (OBSERVATION OF STATIC FATIGUE).
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*RUDERMAN, MALVIN
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REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
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*RUST, J. B.
* * *
RAPID ACCESS PHOTOPOLYMERIZATION IMAGING,
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*SAFFIR, A. J.
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ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
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*SANFORD, R. J.
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DEVELOPMENT AND APPLICATION OF METHODS OF EXPERIMENTAL MECHANICS. INTERPRETATION OF FRINGES IN STRESS-HOLO-INTERFEROMETRY.
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*SCHULZ, R. D.
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APPLICATIONS OF HOLOGRAPHY TO COMPONENT TESTING.
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HOLOGRAPHIC TESTING TECHNIQUES.
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*SHIH, CORNELIUS C.
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RESEARCH AND DEVELOPMENT FLUIDIC CONTROL CONCEPTS AND DESIGNS. PART II.
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*SHOFNER, FREDERICK M.
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OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
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*SIKORA, JEROME P.
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HOLOGRAPHIC DISPLACEMENT MEASUREMENTS ON A HIGHLY SKEWED PROPELLER BLADE,
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*SILVERMAN, HERBERT P.
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ECOLOGICAL STUDIES OF MARINE PLANKTON.
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*SIMORDA, JOSEF
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NEW POSSIBILITIES OF NON DESTRUCTIVE TESTING OF TIRES BY LASER HOLOGRAPHY. I. PRINCIPLE HOLOGRAPHY,
AD-734 916

*SIMPSON, C. E.
* * *
A HOLOGRAPHIC OPTICAL ELEMENT FOR VISUAL DISPLAY APPLICATIONS.
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*SLAKER, FRANK A.
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DATA RECORDING TECHNIQUE FEASIBILITY STUDY.
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*SMORODINSKII, YA. A.
* * *
PROGRESS IN HOLOGRAPHY,
AD-733 204

*SOPORI, B. L.
* * *
3-D HOLOGRAM SYNTHESIS FROM 2-D PICTURES,
AD-736 057

*SOROKO, L. M.
* * *
PROGRESS IN HOLOGRAPHY,
AD-733 204

*SOSKINE, M. S.
* * *
HOLOGRAPHIC METHOD OF IMPROVING THE DIVERGENCE IN RADIATION OF THE RUBINIC OKG IN THE REGIME OF FREE GENERATION (GOLOGRAFICHESKII METOD ULUCHSHENIYA RASKHODIMOSTI IZ: UCHENIYA RUBINOVOGO OKG V REZHIME SVOBO DNOI GENERATSII),
AD-746 646

*SPAID, FRANK W.
* * *
HOLOGRAPHY AS APPLIED TO JET BREAKUP AND AN ANALYTICAL METHOD FOR REDUCING HOLOGRAPHIC DROPLET DATA.
AD-749 854

*SPANOUDIS, L.
* * *
DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
AD-718 896
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DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
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ECOLOGICAL STUDIES OF MARINE PLANKTON.
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PHASE HOLOGRAPHIC STORAGE MEDIA FOR DISPLAY APPLICATIONS.
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*STEINBERG, BRUCE N.
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EXPERIMENTAL VERIFICATION AND VISUALIZATION OF CREEPING WAVES FOR ACOUSTIC SCATTERING BY RIGID BODIES IN AIR.

AD-704 159

*STEINBERG, R. F.

* * *

UNDERWATER VIEWING SYSTEM USING SOUND HOLOGRAPHY.
AD-740 836

*STEINBERG, RONALD F.

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INTERIM TECHNICAL REPORT.
AD-513 812

* * *

SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING.
AD-734 693

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SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING.
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*STEVENSON, WARREN H.

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STUDY OF POTENTIAL APPLICATION OF HOLOGRAPHIC TECHNIQUES TO MAPPING.
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*STRAHLE, WARREN C.

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THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME IV. THEORY OF TURBULENCE GENERATED JET NOISE, NOISE RADIATION FROM UPSTREAM SOURCES, AND COMBUSTION NOISE.
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*STROKE, G. W.

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A NEW HOLOGRAPHIC IMAGE DEBLURRING METHOD,
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ENHANCEMENT OF ELECTRON MICROGRAPHS BY HOLOGRAPHIC IMAGE DEBLURRING,
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*STROKE, GEORGE W.

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HOLOGRAPHIC IMAGE DEBLURRING,
AD-719 055

*STRUEBIN, H. B.

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INCREASING THE DYNAMIC RANGE OF COHERENT OPTICAL FILTERS BY MEANS OF MODULATING GRATINGS.
AD-742 349

*SWEENEY, D. W.

* * *

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-734 408

*SZABO, NICHOLAS S.

* * *

DIGITAL DATA RECORDING FOR HUMAN READABLE MACHINE READABLE (HRMR) INFORMATION PROCESSOR.
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*TARPLEY, WILLIAM B.

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CRITICAL THOUGHTS ON STRUCTURAL MECHANICS AND NDE,
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*TETREV, RONALD E.

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HOLOGRAPHIC MULTICOLOR MOVING MAP DISPLAY (LABORATORY MODEL).
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*THORP, LAWRENCE D.

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DATA RECORDING TECHNIQUE FEASIBILITY STUDY.
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*THUREN, JOHN B.

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SEISMIC HOLOGRAPHY FOR UNDERGROUND VIEWING.
AD-746 498

*TRICOLES, G.

* * *

MICROWAVE HOLOGRAPHY FOR RADOME ANALYSIS.
AD-744 072

*TROLINGER, J. D.

* * *

AERODYNAMIC HOLOGRAPHY.
AD-709 764

* * *

HOLOCAMERA FOR EXAMINATION OF WATER DROPLETS IN A LARGE HIGH ALTITUDE TEST CELL.
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*VAINSHTEIN, G. G.

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MOTION PICTURE AND TELEVISION ENGINEERING. VOLUME 14, NUMBER 6, 1970 (SELECTED ARTICLES),
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*VALKENBURG, M. E. VAN

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A STUDY OF NETWORK AND SYSTEM SENSITIVITY OF SIGNAL PROCESSORS FOR USE IN AIR FORCE SYSTEMS SUCH AS COMMAND AND CONTROL SYSTEMS.
AD-731 294

*VANDER HAAGEN, GARY A.

* * *

APPLICATION OF CINEHOLOMICROGRAPHY TO THE STUDY OF MICROCIRCULATION HEMODYNAMICS.
AD-719 401

*VARNER, J. R.

* * *

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-734 408

*VELLA, I. C.

* * *

SOME ASPECTS OF SCANNED REFERENCE BEAM HOLOGRAPHY,
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*VEST, C. M.

* * *

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-734 408

*VEST, CHARLES M.

* * *

INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-705 228

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INVESTIGATION OF HOLOGRAPHIC TESTING TECHNIQUES.
AD-718 386

*WASIELEWSKI, JAMES E.

* * *

OPTICAL SPATIAL FILTER ANALYSIS.
AD-871 156

*WATERS, J. P.

* * *

INVESTIGATION OF APPLYING INTERFEROMETRIC HOLOGRAPHY TO TURBINE BLADE STRESS ANALYSIS.
AD-702 420

*WATSON, KENNETH

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REPORT OF THE 1971 JASON LASER SUMMER STUDY. VOLUME I. RECOMMENDATIONS AND CONCLUSIONS,
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*WEBB, RONALD O.

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OPTICAL PROCESSORS FOR HOLOGRAPHIC VELOCIMETRY DATA.
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*WEIGL, FREDERIC

* * *

MULTI-PASS OPTICAL ATTENUATION MEASUREMENTS UTILIZING HOLOGRAPHIC TECHNIQUES AND OPTICAL LASER SCATTERING FOR ANALYSIS OF TRANSPARENT MEDIA,
AD-710 144

* * *

PLASMA DIAGNOSTICS UTILIZING OPTICAL INTERFEROMETRY AND HOLOGRAPHIC TECHNIQUES,
AD-731 964

*WENGERT, P. R.

* * *

DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.

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DAMAGE THRESHOLD STUDIES OF GLASS LASER MATERIALS.
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*WHITLOW, DANA E.

* * *

APPLICATION OF CINEHOLOMICROGRAPHY TO THE STUDY OF MICROCIRCULATION HEMODYNAMICS.
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*WIMER, ARTHUR G., JR

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PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME I.
AD-736 127

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PROCEEDINGS OF THE AIR FORCE SYSTEMS COMMAND 1971 SCIENCE AND ENGINEERING SYMPOSIUM HELD AT THE SHERATON-DAYTON HOTEL AND WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO, 5-7 OCTOBER 1971. VOLUME II.
AD-736 128

*WOLF, EMIL

* * *

INVESTIGATIONS BY ANALYTIC AND THEORETICAL PROCEDURE OF VISIBILITY FUNCTIONS.
AD-702 539

* * *

GENERALIZED FOURIER TECHNIQUES FOR THE THEORY OF LIGHT SCATTERING.
AD-720 858

*WOLFGANG, L. G.

* * *

PATTERN THRESHOLD RECOGNITION DEVICE.
AD-712 324

* * *

PATTERN THRESHOLD RECOGNITION DEVICE.
AD-721 021

*WYNNE, GEORGE A.

* * *

THE GENERATION AND RADIATION OF SUPERSONIC JET NOISE. VOLUME V - APPENDIX I. TURBULENCE MIXING REGION NOISE DATA.
AD-749 141

*YURA, H. T.

* * *

HOLOGRAPHY IN A SPATIALLY INHOMOGENEOUS MEDIUM,
AD-708 911

*ZISFEIN, MELVIN B.

* * *

CRITICAL THOUGHTS ON STRUCTURAL MECHANICS AND NDE,
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