NOISE POLLUTION

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Jan. - 31 Mar. 1973 (New Mexico Univ.)

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JANUARY 1 THROUGH MARCH 31, 1973

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THE UNIVERSITY OF NEW MEXICO
ALBUQUERQUE, NEW MEXICO 87131
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NOISE POLLUTION RESOURCES COMPENDIUM

QUARTERLY UPDATE
March 31, 1973

Prepared by

THE TECHNOLOGY APPLICATION CENTER
INSTITUTE FOR SOCIAL RESEARCH & DEVELOPMENT
THE UNIVERSITY OF NEW MEXICO
ALBUQUERQUE, NEW MEXICO
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This is the first issue of the planned quarterly publications concerning noise pollution. The quarterly issues will be combined at the end of each year into a single volume. This method of publication makes it possible for subscribers to remain currently aware of noise pollution information and at the same time, satisfy the needs of those requiring less urgently timed information through use of the yearly publication.

The eight sections of the basic Noise Pollution Resource Compendium have been merged and/or reduced to five sections in this issue in order to more efficiently categorize the current references.

This quarterly issue features complete abstracts instead of data processed bibliographic citations. The changed format is considered more desirable from a user's point of view. The new format and subject organization will be maintained in the upcoming quarterlies and the annual supplement.

The contents of this quarterly publication are arranged under subject headings which are judged major areas of noise pollution activity. An index at the end of each subject group simplifies cross reference of interrelated articles. This publication is paginated by the accession number of the first abstract contained on the appearing page. The legend of the accession number follows the organization of the basic Noise Pollution Resources Compendium.

NP 73 - 1A - 001

Accession number within category number listings consecutively

Subsection designation

Section designation

Year of search and publication

Noise Pollution
1. NOISE SOURCES
1.A GENERAL
NP73-1A-001
72-STG-0578
Dooms, Ir. L. (Ed.) National Center for Scientific and Technical Documentation, Dept. of Environmental Research, Brussels, Belg.
Research by Belgian investigators on water, air and noise pollution, solid waste and pesticides is documented. Legislation and treatment are also included.

NP73-1A-002
† 60253. CARLESTAM, GOSTA. (Linnegatan 81, Stockholm 0, Swed.) Noise: The scourge of modern society. AMIBIO 1(3): 102-109. Illu. 1972.--The increased consumption of energy for production and transportation generates a waste problem in the form of unwanted sound.
The radiation of sound from a single source, be it airplane for example, will disturb more and more people in consequence of urbanization. Urban man is more or less constantly exposed to sound from a technology-created environment and because of the biological exasperation of human bodies this leads to so-called stress reactions. The mental process determines exposure to disturbing noise (significant or more noise (sound level in the article these problems are discussed in connection with how urban and regional physical planning can eliminate the negative effects of aircraft noise for the 110,000 residents around Arlanda airport in the Greater Stockholm area.

NP73-1A-003
AD-79s90
Environmental Health Lab Nellis Air Force Base TECHNICAL REPORT BIBLIOGRAPHY.
Descriptors: (Air pollution, Air Force research), (Water pollution, Air Force research), (Industrial medicine, Air Force research), (Radiation hazards, Air Force research), Chemical analysis, Electromagnetic, Radiation, California.
A Bibliography of unclassified technical reports prepared by US Air Force Environmental Health Laboratory is presented. It contains a listing by subject matter of a listing of all reports by year with report number and abstract. The report covers each area of environmental topics such as air, water, noise, and radiation pollution.

NP73-1A-004
Presents a brief systems look at what seems to be very unsystematic research coverage of the field in the past decade. There has been extensive discussion of domestic noise during this period, though with notable omissions. There has been research on interference with education, and some on hospitals. Quite a number of activities of importance have hardly had comment, let alone research. Discusses some of the problems for the designer in dealing with the present situation and puts forward ideas which seem to him likely to put design on a better basis.—J. Abst., ed.
1A  GENERAL
    (See Also)

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1.B INDUSTRIAL
Typical industrial plants located in urban, suburban, and rural communities were surveyed and their noise sources were identified. The plants were glass manufacturing, oil refining, power generating, automobile assembling, and can manufacturing. The noise of communities adjacent to these plants was recorded for two minute sampling periods during two days and nights of normal operation and during weekends. Only the external assembly and glass manufacturing plants are principal sources of community noise: elsewhere noise from surface transportation on superhighways and traffic near the plants either predominates or contributes equally with industrial plants. The impact of industrial plant noise on the work and the community environment, and attitudes towards noise legislation are discussed. Noise control programs for industrial plants are described, and the noise abatement technology is assessed.

[Author]

Noise from rotor/stator interactions is likely to be highly complex and paradoxical. By using a qualitative theory based on the work of Kaji and Okazaki, however, it is possible to predict the behaviour in the forward case of the tone noise from the convective interaction of the fan rotor and stator. In this paper a theory is developed and extensive results from a flow experiment at subsonic tip speeds (although designed for supersonic operation) are used to justify and illustrate the theory.

[Author]
A simple method of reducing the noise in the air
suction chamber was sought and tested. -- J. E. P.
NP73-1B-008

73-2TE-00049
Van Steenbergen, G.

See Citation No. 73-2TE-00049, pp. 158-166, 1971.

In English; Eng., Fr., Ger. sums., illus., refs. (Some in Du.), from AS & Eng., Fr., Ger. sums., 21 figs., no refs., from Sum.

INDUSTRIAL NOISES : NOISE REDUCTION : MACHINERY : INTERNAL-COMBUSTION ENGINES : RURAL AREAS : NETHERLANDS:

compressors : gas turbines : Ommen.

The Netherlands gas compressor station, Ommen, has operated for 1/2 yr with 6 compressor units of 15,000 hp each, driven by gas turbines. The station is situated in a rural environment which made it necessary to fix the permissible noise levels of the rather low noise rating value of 30 outside the nearby houses. Noise production of the main gas turbines is studied and the silencing measures are made from the necessary excess attenuation. Particulars about the composition and dimensions of the silencing equipment are given. Graphs with measuring results from some noise sources are shown.

NP73-1B-009

72-6TE-0181
Kratz, Gert
Druckluft, Larm und Umweltschutz.

In German; Eng., Fr., Ger. sums., 21 figs., no refs., from Sum.

NOISE SOURCES : NOISE REDUCTION : COMPRESSED AIR : environmental protection.

The problems of defining noise sources beside those caused by compressors and pneumatic hammers are discussed, as well as measures for noise reduction. The use of compressed air for environmental protection e.g. with the air-bubble method or in deep sea drilling is also considered.

NP73-1B-010

72-6TE-0180
Arvidsson, Ola
Berglund, Kenneth
Berlin, Mathis
Wahlstroem, Sten
Aaberg, Sven

Sten (both) Statens Institut foer Folkhalsan,
Stockholm, Sweden
Lunds Universitet, Institutionen foer
Hygien, Sweden
(both) Kungliga Tekniska Hogskolan,
Institutionen foer Byggnadskustik,
Stockholm, Sweden

Byggbuller som samhallsproblem, Del 2.

In Swedish; no abs.; numerous figs., data tables, no refs., SS.


Tables are presented of building site noise measurements, generated by earth moving and construction equipment. Data for each machine is presented with a photograph, description and measurement results.

NP73-1B-011

72-6TE-0168
Lamonica, Joseph A.
USBM, Pittsburgh Technical Support Center, PA

Noise levels in cleaning plants.

No abs., 5 figs., 5 tables, no refs., from introd. & text.

NP73-1B-012

72-6TH-0887

Research entitled theoretical studies of fan-noise generation by a transonic compressor blade row.


NOISE LEVELS : MINING INDUSTRY : cleaning plant noise.

In anticipation of noise regulations for coal mine surface facilities, the U.S. Bureau of Mines conducted a noise survey at 3 cleaning plants in an attempt to identify possible problem areas. Those occupations where the individual's exposure exceeded the limits of the proposed noise sources were identified. The manner in which sound energy is distributed over the audible range of frequencies was described.
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1.C HOME, OFFICE AND NON-INDUSTRIAL
The new attitude toward sound and acoustics in the architectural environment is considered. Acoustic properties as such, man as producer and consumer of sounds, as well as the perception of and sensitivity to acoustics were examined in detail, and the new hypotheses and proposals were clarified by examples and discussions of position. Observations relating to the architectural interior as a form of the environment inhabited by man are considered. In order to ensure him sonic comfort, man is initially considered as the object (construction of a new system of location and orientation of the spatial coordinates at eye and ear level); then as the subject (in terms of his faculties of spatial perception and the responses elicited by sound signals); finally, man-to-man relations. Measures of planning, technical production, and sound insulation in the created environment are described. These considerations show sound to be a component of the environment, and some aspects and criteria of a technical sonic nature that promote comfort and achievement are therefore taken into account.

Household noise problems: P.K. BADEE (Carrier Corp., Syracuse, NY); J Acoust Soc Am, 80, no. 5 pt 1 Nov 1971 p 1335-6; Communications to the Editor make a plea for uniform sound rating on household equipment, for information on proper application and installation and for realistic criteria on acceptable sound levels. Recent standards are cited for the Air-Conditioning and Refrigeration Institute. Data are given for noise of a refrigerator, air conditioner and dishwasher in a typical kitchen.

Determination of the noise level in pharmacies)
Lefalek, N.
Svarmatika 29:66-8, Sep-Oct 71 (Eng. Abstr.) (Ref)
1C  HOME, OFFICE AND NONINDUSTRIAL
(See Also)

1A004  3B034  3B055  3D017  3D032  4B006  5C013
3A007  3B052
I.D URBAN
The purpose of the report is to define the noise environment due to military aircraft operations in the vicinity of Miramar Naval Air Station. The noise environment is depicted by maps of contour noise contours which are interpreted as areas of suggested impact on land usage. The major purpose of the study is to provide interpretations of the aircraft noise on an area by area basis in the compatible development of land surrounding Miramar Naval Air Station.

Two separate but related activities which were undertaken to provide a tool for the evaluation of changes in aircraft noise around airports are presented. The two activities involved, first, the development of extensive and detailed data on land use around the three major air carrier airports in the area encompassed by the Regional Airport Systems Study, and, secondly, the creation of a computer-based system for manipulating the data so that it can be conveniently used for the study of alternative airport development plans. As inputs, the analyses use the noise contours computed for the Regional Airport Systems Study and detailed land use data prepared by the Regional Airport Systems Study. The computer program for merging the land-use data and the noise contours is described.
NP73-1D-003


Noise level measurements at 150 locations around the Cannabis airport are discussed. Effective Continuous Perceived Noise Levels (ECNPL) are given for eight aircraft types. A noise level contour map and a diagram of noise duration allowances vs. aircraft distance are given for the airport.

V.2.

NP73-1D-004


The procedures and results of a recent special survey assessing the problem of combined aircraft and traffic noise are outlined. Correlations with various noise exposure units are examined. The results indicate some influence of traffic background noise on both annoyance due to aircraft and the overall dissatisfaction due to aircraft and traffic. The use of a unit in the form of a noise pollution level scale, to offer the possibility of a promising method for predicting dissatisfaction due to combined noise exposure. M.V.E.

NP73-1D-005


Summary of the main features and results of the second noise and social survey conducted around Heathrow airport in 1967 for the purpose of verifying the validity of the results obtained from the first 1961 survey. A brief statement is presented of the 15 main conclusions reached. M.V.E.

NP73-1D-006


A review of existing guidelines and noise levels relating to aircraft indicated that they were governed, not by the acceptability of the aircraft noise to an exposed community, but by economic considerations. To examine the impact on aircraft noise requirements of a change in emphasis, from vehicle economy to noise acceptability, existing literature was used to estimate the maximum noise exposure from aircraft that a community would probably find acceptable. The suggested limit is 50 dBA (daytime) and 40 dBA (night time) per day. Ideally, this noise level should fall within the aircraft boundary or on nonresidential land.

NP73-1D-007

Problems and problems of achieving community noise acceptance of VTOL. W. Z. Szymanski (Boeing Co., Vortac Div., Philadelphia, Pa.) and F. M. Schmitt (U.S. Army, Air Mobility Laboratory, Wright Field, Calif.). International Council of
A noise survey conducted to determine whether客观环境噪声水平达到允许范围。具体要求未详细描述。车辆设计也考虑了这些条件。

噪声是由于交通、工业、建筑和其他活动产生的。交通噪声是主要的噪声源。

噪声对健康的影响已得到广泛关注。噪声可能导致听力损失、心理压力和心血管疾病。

噪声控制是通过减少噪声源、改善传输路径或使用降噪设备来实现的。在道路系统中，这可能包括使用更安静的车辆或调整交通流量。

噪声测量和分析是通过使用各种工具和方法来完成的，包括声级计、频谱分析仪和噪声监测系统。

噪声控制的目标是将噪声水平降低到一个可接受的程度，以保护公众的健康和福祉。
Highway noise. A design guide for highway engineers. C.G. Colla-Don (Bolt Bronoek and Normkon, Los Angklo, CA); W.J. Gallo-Way, B.A. Kugles, D.L. Nelson; High Reo Ed, Nat Conp High Reo Program Rep 117, 1971, 79 p. The report describes and com- pares different analytical and experimentally derived models of traffic noise, and discusses the model used in the Design Guide. It also describes the sources of information and technical approaches used in determining the noise level adjustments for finite element length, accessible barriers, elevating or depressing the roadway, gradients and different road surface conditions, and the presence of intervening buildings or foliage between the source and the noise source. Several approaches to the selection of criteria for traffic noise. 58 refs.


No abs., illus., refs. from Text & SS.


Diesel engines are noisier than gasoline engines, but because of their greater fuel economy, they remain in widespread use. Sources of diesel engine noise, the relation between combustion induced and piston slap noise, characteristics of combustion controlled noise, effect of timing gears and accessories, noise and engine design parameters, and consideration of the principles of noise control are discussed. Diesel engine noise can be reduced even taking into account future trends for higher power outputs. However, research efforts must investigate high pressure charging techniques for automotive use in conjunction with studies of exhaust emissions; quiet structure design is "just as important since only by both techniques can the required demands be met.

Noise and the truck driver. See Citation No. 73-1TE-00007 p. 127 [1972].
Abs. only. from AA.


Truck drivers may be exposed to high noise levels while driving. The source and character of the noise, the noise reduction achieved, and the noise reduction techniques utilized by one Industrial Hygiene Department are reviewed. The most effective combination of noise reduction techniques achieved a level of 84 dB(A) under all driving conditions (with closed windows and air vents).

Abs., illus., refs. from AA & SS.


A community noise survey was made of the Greater Vancouver Regional District, British Columbia, Canada, which covers 560 mi². Approximately 100,000 individual noise measurements were recorded over a 4-mo period. The statistical noise climate in residentially zoned areas was almost identical in level distribution to that observed by Donley for the mid-Atlantic states some years earlier. In deciding what maximum noise levels should be allowed, the following factors should be taken into consideration: economic impacts, community benefits, enforcement problems, and political motives.
Urban traffic noise: Strategy for an Improved Environment.  

The criteria categories examined to find out what effect traffic has on the street as a living environment. Viewpoints of those people who live on the city's streets are presented. The criteria categories examined were traffic hazard, stress, noise, and pollution, privacy and home territory, neighboring and visiting, and identity and interest.

NOISE SOURCES: traffic noise: urban areas: abstract only.

Sources and characteristics of urban traffic noises are given and their effects on humans are listed. Control of urban traffic noise is discussed with reference to modifications in vehicular design, traffic operations, and urban architecture. Current administrative and legislative regulations and directives in various member countries are reviewed. The Consultative Group on Transportation Research of Organisation for Economic Co-Operation and Development makes several recommendations for the role of government relative to vehicle noise, traffic noise and urban environment, economics of noise abatement, research and development, and international cooperation.

Field measurements were carried out to investigate the propagation of traffic noise for 10 different road and housing configurations. The field measurements were carried out to investigate the propagation of traffic noise for 10 different road and housing configurations. The effect of an aperture in such a barrier, was measured and results compared with data for open grassland. Shielding by rows of houses flanking a main road and noise propagation along side-roads branching off main roads was investigated in detail, and empirical curves are presented for predicting levels of L10 (the noise level in dB(A) exceeded for 10% of time) in such situations.

The San Francisco Planning Department did a small study of the quality of the environmental along some of the city's main traffic streets to find out what effect traffic has on the street as a living environment. Viewpoints of those people who live on the city's streets are presented. The criteria categories examined were traffic hazard, stress, noise, and pollution, privacy and home territory, neighboring and visiting, and identity and interest.

Results of a survey of the noise environment in the city of Ahmedabad. India indicate that traffic noise is the major noise source. Several measures are recommended to alleviate the problem and a "noisemap" of the city is included.

Effects of highways on urban environments.  

Highways: AUTOMOTIVE POLLUTANTS: NOISE GENERATION: Impacts on urban highways on the communities through which they pass are studied. Air pollution, noise pollution, access disruption, loss of job opportunities, and loss of housing are analyzed.
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1.E AERONAUTICS
NP73-1E-001

NP73-1E-002

NP73-1E-003

Paper Ref. L.000, 0.000

Paper Ref. L.002, 0.002

Paper Ref. L.003, 0.003

Paper Ref. L.004, 0.004
The contributions of supersonic noise generation are critically reviewed with special emphasis on conceptual adequacy and physical scope with especial reference to supersonic jet noise. This reviews the basic work of Stokos, Kirchhoff and Rayleigh on fluctuating motions in fluids and reveals a need for the critique. The advantages and disadvantages of existing theory are thoroughly discussed in Section 11.3. A contribution is made towards removing the criticism made by Lighthill of Timoshenko's isotropic acoustic torsion theory, and developments such as those by Crow, Lilley and Dorsch are emphasized. On the basis of the evidence provided by the critical review, a new theoretical theory for jet noise has been developed. Author (GRA)

Paper Ref. L.005, 0.005
Preliminary acoustic tests of the engine-over-the-wing concept as a method for reducing the aerodynamic noise created by conventional and short takeoff aircraft are discussed. Tests were conducted with a small wing section model having two flaps which can be set for either the landing or takeoff positions. Data was acquired with the flaps set at 10 degrees and 20 degrees for takeoff and 30 and 50 degrees for landing. The engine exhaust was simulated by an air jet from a convergent nozzle. For field noise data are presented for nominal pressure ratios of 1.25, 1.4 and 1.7 for both the flyover and sideline modes. Author
NP73-1E-004


Aeronautical acoustic problems involve noise in aircraft interiors, stress in the structures, external noise near aircraft, especially in inhabited areas around airports, and with the advent of the supersonic aircraft, the problem of the 'sonic boom'. The general characteristics of aerodynamic noise are discussed, as well as modification of the equation of propagation in a turbulent fluid, and its solution. First applications of the equation to various aircraft are studied. Attention is given to antisound legislation and regulation, recent studies, and future prospects.

F.R.L.

NP73-1E-009


An attempt is made to assess the effects of noise, smoke, and odors produced by aircraft on the environment. The engineering and administrative measures which are being taken to control these effects are also considered. It is suggested that, in addition to existing noise and odor codes, aircraft add to pollution indirectly by enabling people to visit remote places of the earth which would normally be free from pollution. Atmospheric pollution, engine-generated noise, the sonic boom, and pollution of the stratosphere are discussed in detail. It is considered that noise in the vicinity of airports is the core of the problem.

F.R.L.

NP73-1E-010


An experimental study of the effects of primary and secondary discharge rates on the pumping performance and noise generation of a supersonic air ejector. The noise spectra obtained from the tests appear to be in fair agreement with the results found by other investigators.

M.V.E.

NP73-1E-011


It has been demonstrated during flight tests that the Olympic engine cycle, eight years after it was designed, is perfectly suited to supersonic operation. Engineering improvements such as intake casing assembly, annular combustion chamber, modern means of soundness monitoring, etc., were introduced to maintain the engine in the lead of advanced technology while satisfying pollution requirements. Noise reduction is being subjected to extensive research, with continuous improvements being introduced. The use of reheat - with a ratio increased to 18 per cent - was extended to transonic flight operation. Increased payload is ensured by the new type of secondary nozzle, which also contributes to noise abatement. Further engine developments are being considered.

NP73-1E-012

NP73-1E-014

An investigation of axially blown jet impingement noise was conducted using a full-scale turbofan engine and aircraft wing. The noise produced with a daisy nozzle installed on the engine exhaust system was greater than that produced by a conical nozzle at the same thrust. The daisy nozzle caused the jet velocity to drop to a much lower ratio at the flaps. The presence of the wing nose to the conical nozzle increased the noise, as did increasing the flap deflection. Compared with the conical nozzle, the daisy nozzle produced slightly less noise at a flap deflection of 0°, but produced more noise at the lower flap deflections tested. (Author)

NP73-1E-015

Detailed study of the transmission of acoustic signals from the interior of an idealized jet through the mean velocity profile and into the far field. The noise generator is taken to be a sequence of transient acoustic point sources traveling with the local fluid in the idealized jet. The idealized jet is two-dimensional, and contains data to infinity upstream and downstream velocity profile information of streamwise position. For the limited set of examples considered it is shown that the velocity profile has a large effect on the magnitude of the noise radiated to the far field; much of the far field noise, especially at low Strouhal numbers, originates not at the source but in the form of acoustic disturbances within the jet which are not radiating energy. (Author)

NP73-1E-016


The simple pressure source model of the sound radiated by a conical jet is investigated analytically and experimentally. From the simple source model, the ratio of the frequency spectrum of the radiated sound power and the jet pressure is derived for the normal form of the jet-pressure cross correlation. The spatial variation of the overall jet pressures, the frequency spectra of the jet pressures, the sound and radial correlations of the jet pressure, and the cross correlation between jet pressure and farfield sound pressure are measured for a cold jet. Some implications of the simple source model with regard to noise suppression are also discussed. (Author)

NP73-1E-017


NP73-1E-018


A review of many noise problems exists with the operation of jet engines. This statement exists because of a combined lack of balanced knowledge in the application of the various methods used to solve noise problems. A normal lack of recognition that these problems are indeed related and that the noise produced is coupled to the common good. The paper summarizes a proposed strategy for a long term solution to this problem which requires cooperation for all parts involved. (Author)

NP73-1E-019


An economic analysis of hypersonic transports is presented to show projected operating costs (direct and indirect) and return on investment. Important assumptions are varied to determine the probable ranges of values for operating costs and return on investment. The environmental effects of hypersonic transports are discussed and compared to current subsonic transports. Estimates of sideline and flyover noise are made for a typical hypersonic transport, and the sonic boom problem is analyzed and discussed. Since the exhaust products from liquid hydrogen-fueled engines differ from those of airbreathing-fueled aircraft, a qualitative assessment of air pollution effects is made. (Author)

NP73-1E-020


NASA research and development work on the noise of aircraft engines suitable for use on conventional take-off and landing subsonic cruise airplanes is reviewed. The work discussed was part of the NASA Quiet Engine program. Salient results in the areas of fan and jet noise suppression and propulsion system noise are presented and briefly discussed. (Author)

NP73-1E-021

NP73-1E-022


These effects are mainly connected with the thermal radiation, the acoustic emissions, and the exhaust gas production of the engines. The effects of thermal radiation have no harmful characteristics. However, the acoustic emissions produce highly disturbing and sometimes even harmful noise effects. Certain components of the exhaust gases also have disturbing or deleterious effects. The physical mechanisms involved in the origin of the phenomena which produce the environmental effects are examined. Quantitative predictions of general validity concerning the individual effects are discussed, and the relation of these effects with the design parameters of the propulsion system is investigated. A number of suggestions for reducing the harmful environmental effects are made at the end of the proceeding analysis.

G.R.

NP73-1E-023


Description of a new method for evaluating the environmental annoyance of time-varying aviation noise on the basis of statistical data for instantaneous changes in the sound level of noise sources. The propagation is illustrated with statistical data collected by measurements near the approaches and on the runways of the Warsaw-Okęcie airport.

T.M.

NP73-1E-024


An experimental investigation has been conducted on the turbine noise produced by a two-bladed, four-foot diameter model propeller capable of boundary layer control. The propeller has a spinner comprising 70% of the total propeller radius. A porous cowl on both sides of the symmetrical section allows air entering the control system. Flow field measurements were made in a completely enclosed open test section. The blade tip and hub height were 33.5 ft and 14 ft, respectively. The study included both without and with boundary layer control. Agreement with theory was good (within 2 dB) showing a ninth power of tip velocity relationship and a classical oblique radiation pattern for the overall.
The report summarizes the results obtained at General Electric during the first phase of the Air Force Super sonic Exhaust Noise - Velocity Model Program. The overall objective of the program is to develop the technology to significantly reduce supersonic aircraft propulsion system noise with minimum associated performance and weight penalties. To fulfill this objective, research is being carried out to develop the experimental techniques and the necessary theory to reveal the basic mechanisms of jet generated noise through the range of velocities and temperatures typical of present and future military and commercial supersonic aircraft propulsion systems. A comprehensive aerodynamic analysis model describing the flow mechanism in supersonic jets is presented and compared with experimental data. A large number of theoretical models describing supersonic flow field noise are evaluated.

A noise survey was conducted at McClellan AFB, California, to investigate the noise environment of maintenance personnel exposed to the F-111, F-105, and F-15 A/C during line run-up operations. The report describes conditions which were seen to affect the noise environment in the test facility.

The experimental environments can be made by using certain apparatus data from each test. An evaluation of the noise measurements provided by each tester is also made.

NP73-1E-029

NP73-1E-028

NP73-1E-027
Interior noise radiated by an airplane fuselage subjected to turbulent boundary layer excitation and evaluation of noise reduction techniques (Concluded); W. V. BHAT (Boeing Co., Seattle, Washington), J. P. NILBY; J Sound Vib 18 no. 5 Oct 28 1971 p. 650-66. The interior noise radiated by an airplane fuselage structure excited by a turbulent boundary layer pressure field has been measured at two flight Mach numbers. For a single fuselage panel the radiated sound is approximately 90 and 70 dB relative to $10^{-6}$ v at flight 0.59 and 0.56 respectively. Damping tapes and rubber wedge broad-

 community noise levels of the DC-10 aircraft; A. R. MELLEK; Anglo-Am Aeronaut Conf., 12th, July 7-9 1971, CMA Aeronaut and Spaco Inst., 1971, Pp. 193-197. Notation levels for the DC-10 are presented and community noise levels of the aircraft are discussed. 4 rain.


 Hovercraft are a relatively new and unique form of transport, capable of traversing terrains which previously were almost impassable at speed by surface transport. This high-speed capability was gained partially at the cost of ride comfort, but unlike some vehicle developments, as power and speed have increased, the noise and vibration within the hovercraft have steadily decreased with each new craft. The sources of noise and vibration are discussed, together with their possible methods of reduction in order to improve crew and passenger comfort.
Flight noise of aircraft and the subjective judgment of its annoyance.
Abs., illus., refs. (Some in Ger., Russ.), from AA.
AIRCRAFT : ACOUSTIC MEASUREMENTS : TRANSPORTATION NOISES :
Tu-104 jet : subjective judgment of annoyance.
Take-off noise characteristics of the Tu-104 jet airliner in the far sound field was investigated. The local flight noise spectrum varies in accordance with the Doppler effect. A characteristic is given for the influence of noise persistence, number of flyovers, and population density on the subjective judgment of the noise annoyance factor. A method is described for calculating the persistence correction to the perceptible noise level.

Physical properties, causes, and effects of the sonic boom are discussed. Factors affecting the boom are analyzed, including aircraft shape and weight, meteorological conditions, and height at which the aircraft is flying. Maneuvering and acceleration can cause a 4- or 6-fold increase in boom intensity due to focussing. The worst booms come during initial acceleration to supersonic speed because all factors tend toward the largest pressure pulses: the airplane is relatively low and at maximum weight and high incidence.
### AERONAUTIC
(See Also)

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2. NOISE DETECTION AND MEASUREMENT
2.A GENERAL

Standard values of atmospheric attenuation determined from SAE ARP 866 are used in correcting aircraft noise measurements from test day to reference day conditions but errors are often introduced when there is a large difference between test and reference conditions. This paper describes a systematic investigation into atmospheric attenuation by simultaneous measurement of meteorological data and aircraft noise under more than twenty different conditions of temperature and humidity. Measured attenuation values are presented which show better agreement with SAE ARP 866 predictions when conditions representing the whole noise path are used rather than surface conditions. Continuing analysis will provide a direct comparison with SAE ARP 866 and consider the problems of predicting attenuation where only limited meteorological data is available. (Author)
ACOUSTIC MEASUREMENTS: BIOINDICATORS: social, psychological, economic indicators: noise damage.

Human responsiveness to various sound stimuli is discussed, and stress is placed on potential indicative features of noise in the environment. Physical indicators, such as the Phon, Sone, and Noy scales, and perceived noise level, are quite reliable, and the technology is sufficient for providing highly refined sound analysis. Physiological, auditory, and vestibular indicators, such as hearing threshold shifts, cochlear cell damage, and interruption of cochlear and vestibular blood supply, can also be used to define the mechanisms of noise damage. Other indicators of environmental noise include those involving education, safety, psychology, social science, politics, and economics.

ACOUSTIC MEASUREMENTS: NOISE SOURCES: SOUND WAVES.

An introduction to acoustics as a form of wave motion is presented. Making physical measurements of sounds is covered together with the subjective side of acoustics. These subjects are related via the fundamental datum pressure of physical measurements. Definitions are given of the decibel (dB), and some of the simpler forms of loudness scale are described. Important physical characteristics of noise sources which are necessary to know about in order to control noises at their source are covered. Various facets of sound in rooms and buildings are examined.
2A    GENERAL.
(See Also)
1D019  1D024  1E034  3B047  3D025  5A014  5C007
2.B INSTRUMENTS
The audio dosimeter—a system for measuring personal noise exposure. See Citation No. 73-1TE-00006 p. 127. [1972]. Abs. only, from AA.


An accurate measurement on the 'A' scale of the sound energy reaching the ear of the employee during his work days is necessary; his exposure should be limited to prescribed values. Methods of obtaining this measurement utilizing sound level meters, plus time and motion studies, are reviewed and limitations are defined. A new method to obtain this measurement is described. In a single operation, an instrument continuously measures the sound at the ear of the employee for all values between 90 and 115 dB, simultaneously measures time, and integrates the result. Exposure over 115 dB other than impulsive or impact noise is also indicated. Results of 14 mo of field experience are presented and advantages over previous methods are discussed.

A wearable pocket noise dosimeter. See Citation No. 73-1TE-00006 p. 128. [1972]. Abs. only, from AA.

ACOUSTIC MEASUREMENTS : MEASURING INSTRUMENTS : ENGINEERING : abstract only : dosimeters.

A noise dosimeter that meets the ANSI Type II Sound-Level Meter Standard and accumulates the OSHA percentage directly is discussed. The frequency response for noise dosimeters should be measured with 1/3-octave bands of random noise in a reverberant room since this is more repeatable and a better approximation for a device that will ultimately measure noise. These frequency response measurements will show the effects of the proximity of the wearer. The dosimeter is composed of 2 parts: a small pocket unit that accumulates and stores the digital data representing the OSHA percentage and an indicator unit that provides a digital readout on a light emitting diode display. The pocket unit includes a small ceramic microphone, a true rms detector with more than 15 db crest factor capacity, and an extremely low-power MOS digital counter to store the OSHA percentage. It weighs 7 oz and runs for over 300 hr on an ordinary 9V transistor battery.

[Low-cost classification measuring instrument for the exact determination of equivalent permanent noise level] Liebold W. Z Gesamte Hyg 18:318-31, May 72 (Ger)

[Improved noise meter] Knügge GP. Gig Saht 37:812-13, Feb 72 (Rus)
2B INSTRUMENTS
(See Also)

2C008  3D052  5C013  5C022
2. C TECHNIQUES
NP73-2C-001

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-002

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-003

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-004

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-005

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-006

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-007

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-008

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.

NP73-2C-009

A hot of generation which are composed in eliminating the area noise around this district. Preliminary noise on glass for the relative between noise level and central distance, for different church types as causes of noise, for each suits under actual church and, and for the effects of soundproofing and topography evolution on noise propagation in the church area.
This paper is concerned with the problem of computing the
noise duration correction in the effective duration time made to
zero, a condition that results when the peak pressure level
approaches a noise floor. The present method for computing the
duration correction leads to extremely large negative values as the
effective duration time approaches zero. A modification is suggested
to avoid this anomaly.

NP73-2C-010

Experimental atmospheric absorption values from aircraft fly-
over noise signals; D.S. BISISOP (Boeing Douglas and Northrup
Inc., Van Nuys, Calif., M.A. SIMPSON, D.S., NASA Con-
tract Rep CR-1791 June 1971, 71 p.; A detailed analysis of the
noise recorded on the ground during a series of 20 aircraft
flyovers by two aircraft (a four-engine turboprop transport and
a four-engine piston transport) during a single day of field
measurements has been completed. Noise levels recorded at
different positions under and to the side of the flight path were ac-
quired from the field data. Differences in one-third octave band
noise levels observed at different ground positions for
the same angle of radiation from the aircraft were utilized to
obtain data of absorption values, 7 refs.

NP73-2C-011

Perceived level of noise by Mark C. and
Adriana (71), H. B. Stevens, bibilid
A personal dosimeter was developed to monitor an individual's exposure to noise. The dosimeter is only 15 in. and is carried in an individual's pocket. The batteries provide for 2-mo operation and the unit features instantaneous readout of the percentage of maximum permissible exposure, true rms detection, and a continuous weighting scale. The results obtained in field testing and performance criteria for such devices are discussed. An on-muff with miniaturized electronics to permit the wearer to hear low level signals while protecting the muff but protect him from levels in excess of 50 dB(A) is also described.


The reduction of sound level generated by a product involves determining the sources and attenuating or eliminating the noise by design. Several techniques for identifying noise sources are discussed. Spectrum, correlation and coherence functions can yield considerable insight into noise sources and transmission paths. The spectrum reveals the frequencies contained in the sound generated by a product, the correlation functions reveal the transmission paths from various components as well as which specific frequencies each component may be generating; and the coherence functions determine whether a frequency generated at one point is coherent with an aperiodic same frequency located at another point. Applying the results of the coherence spectrum to the cross-spectrum yields a very valuable corrected cross-spectrum.


Existing literature on different methods of calculating traffic noise is reviewed. A new method for calculating noise from road traffic is presented, based on extensive measurements and differing from other methods mainly in that it was possible to simplify the calculating procedure due to the development of new types of charts. The new method is also presented for measuring the effect of finite barriers. The new method is directly compared with the other older methods of calculation.
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2. D FACILITIES
Magnitudes estimated by each of 31 observers were obtained for a variety of noise sources under three models of auditory presentation: loudspeaker presentation in an anechoic chamber, loudspeaker presentation in a normal non-anechoic room, and earphone presentation. Comparability of ratings obtained in these environments was evaluated with respect to reproducibility of ratings from physical measurements, reliability of ratings, and the scale values used to assess these stimuli. A common environment was found to have both effects upon physical prediction methods and ratings of perceptual magnitudes where both effects were found to have the same magnitude as the physical magnitudes of sound-source motion. As for
2D FACILITIES
(See Also)

2B002  5B001
3. NOISE ABATEMENT
   AND CONTROL

49
NP73-3A-001

NP73-2020/2 77 Research Inst., Chicago, Ill.
STUDY OF NOISE IN ALL ROUTE TRAFFIC CENTERS, PRIMARY SERVICE CYCLES, AND TRAFFIC CONTROL TOWARDS AND REMOTE FACILITIES Final Report.
30 Nov. 1971 - 10 May 1972
J. A. Minor and R. C. Wolfsberg Oct. 1972 30 p. ed
(Contract DOT-PAP-72-191) J-P-230090-A00-00-72-10-43 Contract: RTTI-63-230
Various methods of reducing noise in several FAA or NASA control and navigational facilities that occur in the measurement of such noise at remote locations are described. Noise control measures for each facility under consideration are discussed as well as the results for reducing specific noise reduction methods. Another

NP73-3A-002

NP73-20770/6 National Aeronautics and Space Administration, Lewis Research Center Cleveland, Ohio
THE BASIC QUALITY EXPERIMENT
NAAG-135-X-00411: 8-10790 Award: 1116-60 3500-3063-814

W. C. & C. in Cleveland, Ohio, is developed an eonro noise reduction technology outside for use on engines and assembled aircraft and leading into the noise analysis and control. The basic quality experiments were developed and controlled by the following quality standards: (1) high powered noise engines, (2) large under-wing mounting of noise sources, (3) noiseless noise by control, (4) noise spectral analysis of noise spectral analysis, and (5) on optimum noise from noise tapes to noise levels. The results of this type of noise control are applied to future control, modified conditions on control noise levels and to develop... L-10-08-1

NP73-3A-003

NP73-30873/0 Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control
ADVISORY PROGRAMS OF PROFESSIONAL/INDUSTRIAL ORGANIZATIONS, UNIVERSITIES AND COLLEGES
31 Oct. 1971 33 p. ed
RMDS-30873/0 Award: 500-025-75
Information, containing names of programs being sponsored or carried out, either directly or indirectly, by professional, industrial, and voluntary organizations (assisted by potential, information is also given on private industry research and educational and research programs. A bibliography of potential publications containing data is provided. Another
NP73-3A-004

NP73-3A-005

NP73-3A-006
The present study examines the problem and introduces the Environmental Protection Agency.

The results of the investigation showed that noise levels produced by the same type of decay-sawing cord and covered with the same type of material were lower than those produced by high-speed sawing of the same cord covered with six inches of untreated material. (Author)
The need to limit plant noise to meet increasingly stringent regulations and standards should be considered during the plant design stage to avoid costly modifications. Design procedures utilizing a computer program were developed by Humphreys & Glisan, Ltd. The program calculates the maximum tolerable sound pressure level for each individual piece of equipment so that the total assembly will meet both community and plant noise level limits, and also provides data for preparing detailed specifications for each piece of equipment. The second part of the program shows the effect of the detailed engineering on the noise levels of the plant.

A detailed specification for each piece of equipment in the assembly is presented. The mandatory regulations and standards should be considered in the design of the machinery is detailed. The mandatory hearing conservation program is outlined.

The mandatory hearing conservation program is outlined.

The mandatory hearing conservation program is outlined.

The mandatory hearing conservation program is outlined.

The mandatory hearing conservation program is outlined.
Future of gasoline engines.
Abs. only, AA.
Also in: Society of Automotive Engineers. New York. Section Papers No. 720615.
GASOLINE ENGINES : EMISSION CONTROL : NOISE REDUCTION : ECONOMICS : abstract only.
The present gasoline engine is examined against the requirements for an automotive powerplant such as performance, economy, operational factor and availability considerations. New factors of emissions and noise are shown to modify the basic requirements. The effect of these factors on future gasoline engines is discussed.

NOISE REDUCTION : INDUSTRIAL NOISES : FEDERAL REGULATIONS.
73-1TG-00187
Anon.
Environmental engineering and science conference.
Sums., illus. for various papers, SS.
Environmental pollution is discussed, including; air quality control; water quality; noise abatement; solid waste disposal; and waste water treatment. In addition to technology, legal and economic aspects of environmental pollution are considered.

NOISE REDUCTION : INDUSTRIAL NOISES : LEGISLATION.
73-1TG-0018
73-1TG-00187
Anon.
Environmental engineering and science conference.
Sums., illus. for various papers, SS.
Environmental pollution is discussed, including; air quality control; water quality; noise abatement; solid waste disposal; and waste water treatment. In addition to technology, legal and economic aspects of environmental pollution are considered.

NOISE REDUCTION : INDUSTRIAL NOISES : TRANSPORTATION NOISES.
73-2TE-00063
Jungiian, Rudolf
Arbeitsausschuss der Bergakademie. Freiberg, GDR
In German; Eng., Fr. sura, no refs., from AS.
NOISE REDUCTION : GERMAN DEMOCRATIC REPUBLIC.
The organization of essential elements of noise control in the German Democratic Republic is described, and it is shown in what way noise control will become effective. Some basic principles are stated. how they are realized and put into practice by efficacious incorporation into the material as well as by the supervision of local and industrial branches as well as by incorporation into the governmental and social supervision is explained.

NOISE REDUCTION : INDUSTRIAL NOISES : FEDERAL REGULATIONS.
73-1TG-0018
73-1TG-00187
Anon.
Environmental engineering and science conference.
Sums., illus. for various papers, SS.
Environmental pollution is discussed, including; air quality control; water quality; noise abatement; solid waste disposal; and waste water treatment. In addition to technology, legal and economic aspects of environmental pollution are considered.
residential dwellings with which the State Research Institute for Thermal and Sonic Technology (Austria) dealt in the last 15 yr. Three separate groups of industry can be distinguished with reference to noise production and methods of reducing the external emission of noise: large plants that occupy considerable areas of land and whose noise at least part of the noise production is out-of-doors; fairly large enterprises operating in their own self-contained industrial premises; and smaller plants that do not require an entire industrial premises and are therefore usually housed in the basement, ground floor, yard or annexes of dwelling houses. The laws of extending and checking airborne and structure-borne sound are studied with practical examples and on a model.

NP73-3A-025

72-ST6-0148

Anon.


A series of papers on industrial noise and vibration control is presented. Topics include basics of noise and vibration; principles of noise and vibration control; measuring techniques, acoustic materials for absorption, acoustic materials for transmission loss; vibration isolation; vibration test facilities and techniques; criteria and standards; hearing conservation; and an industrial noise control case study.

NP73-3A-026

72-ST6-0151

Hub, D. R.

Univ. Wales, Inst. of Science and Technology, Dept. of Applied Physics, Cardiff, Eng.

Principles of noise control.

See Citation No. 72-ST6-0148. 18 pages. 1972.

1 Abs., 7 figs. 2 appendices, 19 refs. from Text.

NOISE CONTROL: Technology: source: path: receiver

Noise control is the technology of obtaining an acceptable noise environment for a receiver consistent with economic and operational considerations. The receiver may be, for example, a group of people, an entire community, or a piece of equipment. Various aspects of noise control are discussed: reasons for noise control; economic considerations; points of attack; statistical aspects; interaction between source, path and receiver; noise control at the source; control of the transmission path; noise control at the receiver; and systematic noise control.

NP73-3A-027

72-ST6-0155

Gordon, Colin G.

Univ. of Southampton, Inst. of Sound and Vibration Research, Wolfson Unit for Noise and Vibration Control, Eng.

Industrial noise control: A case study.

See Citation No. 72-ST6-0148. 18 pages. 1972.

2 Abs., 2 figs. 4 tables, 69 refs. from Introd. & SS.

NOISE CONTROL: INDUSTRIAL NOISE: FOUNDRIES: ENGLAND: building design.

A case study is presented which involves the development of noise design constraints for the installation of a new plant in a foundry in the Midlands of England. The various stages of development are described.

NP73-3A-028

72-S76-0107

Coors, L.V.

American Oil Co., Texas City, TX

Plant operations & loss prevention: Noise abatement in ammonia plants.


Abs., 3 figs. no refs. from Text & SS.

INDUSTRIAL PLANTS: NOISE CONTROL: NOISE REDUCTION

TENSA: ammonia plant: refinery: equipment modifications: protective measures.

A case history is presented of the noise abatement program initiated at the ammonia facility of the American Oil Co. integrated refinery. Noise sources were identified and silencers were installed at the process vent upstream of shift conversion and at a steam superheating coil outlet vent. Concurrent with equipment modifications to reduce a plant-wide program was instituted to specify protective measures to be used when work conditions require extended exposure to noise.

NP73-3A-029

72-S76-0801

Bornert, J.

Protection of the environment - a task of our time.


In English: no abs., 1 ref. from Text & SS.

EMISSION CONTROL: WATER QUALITY: NOISE REDUCTION

GOVERNMENT PROGRAMS: GERMANY: symposium summary.

The hazardous influences on the environment of industrial and automotive emissions noise and water pollutants are discussed, and monitoring systems and government programs for pollution abatement are described.

NP73-3A-030

72-D76-0838

Anon.


Abs., figs., tables, data tables, refs. for various papers, SS.

COAL INDUSTRY: AIR POLLUTION CONTROL: NOISE CONTROL

MINING INDUSTRY: American Mining Congress 1972 Coal Show selected papers cited.

Sections detail mine wastewater treatment, noise abatement, and emissions reductions in coal-burning power plants. The control of dust in mines through the use of foam and strip mine land reclamation are also discussed.

NP73-3A-031

72-S76-0838

Anon.

Environmental pollution and its control.

Environmental Pollution and Its Control. Seminar Abstracts. (Held in Baroda, India, April 15-17, 1972). Institution of Engineers (India), Baroda Sub-Centre. 79 pages. [1972?]

Abs., only, SS.

WATER QUALITY CONTROL: WASTE TREATMENT: AIR POLLUTION

CONTROL: NOISE CONTROL: pollution control: seminar: abstracts only: selected abstracts cited.

Abstracts on air and water pollution and control of such pollution...
are presented, covering areas like wastewater treatment theory, treatment methods, unit processes theory and design, industrial waste treatment; noise pollution; air pollution control theory, analytical procedures, surveys, hazards, automotive pollution and its control; and development of standards.

NP73-3A-032

[Assessment of noise and sound protection] Lapho A. van.
Z Laryngol Rhinol Otol 51:215-20, Apr 72 (Eng. Abstr.)
### GENERAL
(See Also)

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3.B METHODS
NP73-3B-001

NP73-3B-001/ 3B-001

The following is the abstract of Form 3B: 001:

A METHOD OF THE VARIATION EXHAUST NOISE
CONCEPT AS A NOISE REDUCTION DEVICE FOR
A JET ENGINE WITH EXHAUST NOISE REDUCTION
PLUGS

R. A. Mooney, S. H. Malin, and H. C. Dawson

NP73-3B-002

NP73-3B-002/ 3B-002

The following is the abstract of Form 3B: 002:

A NOISE REDUCING EXHAUST NOSEBLEED Patent Application

R. A. Mooney, S. H. Malin, and H. C. Dawson

NP73-3B-003

NP73-3B-003/ 3B-003

The following is the abstract of Form 3B: 003:

A NOISE REDUCING EXHAUST NOSEBLEED Patent Application

R. A. Mooney, S. H. Malin, and H. C. Dawson

A method for reducing the noise of a jet engine is described, including the cooling of the exhaust gas by mixing low velocity secondary gas (SG) with high velocity primary gas (PG) and the installation of a nosebleed device. The SG is used to control the noise level, and the PG is used to cool the exhaust gas. The method is effective in reducing the noise level of the engine, and the installation of the nosebleed device is simple and practical.
NP73-3B-004

A73-10203 0 2


A number of optimization problems are posed and solved for supersonic aircraft flight subject to the condition that a shock wave appears only incipiently in the sonic boom signal at a given point. The principal result is one giving the maximum effective mass weight of an aircraft of given effective length under given flight conditions. The calculus of variations with inequality constraints is used, with the novel feature of a non-local invariance relation and of only one upper bound on a control variable. (Author)

NP73-3B-005

A73-11560 0


Hillen (1971) proposed the use of microphones for measuring the "boom" noise as a means of determining aircraft advances along the flight path of supersonic aircraft. The tests are such that current flight causes a local phase of shock waves and that, in engine data, is the upper bound of curvature than this, shock does not form. By applying a technique, which action is possible to plot the shock front directly, so microphone of the type proposed by Hilt, it is found that regions of single, double, and into triple shocks can occur, however, no shockless regions are observed. (S.G.)

NP73-3B-006

A73-12300 0

Further studies of the characteristics of jets perturbed by vortices, R. E. A. Arndt, G. Borolean, and R. C. Tait (Pennsylvania State University, State Collage, Pa.). American Society of Engineers, Buffalo, N.Y., Apr. 18-21, 1972; Paper 34, p. 141 ref. NASA-supported research.

The results of a study conducted by Arndt (1971) indicated that a substantial attenuation of noise intensity can be achieved through the insertion of a screen into the jet flow. An extension of this study is reported. The new investigation includes detailed surveys of both pressure and velocity in a large subsonic turbulent jet. Emphasis is placed on the mixing characteristics of the jet and their relation to noise radiation. Background material is discussed, giving attention to basic theory, turbulent jet dynamics, and the radial distribution of sound sources and characteristc power spectra. The study was confined to the region of jet flow from zero to eight diameters from the nozzle. It was found that there is a substantial neartomation of turbulence structure in the mixing region. (G.R.)

NP73-3B-007

A73-12955 0


The problems of acoustical noise generation, propagation, and attenuation in both lined and unlined straight cylindrical ducts, as well as 90 deg bends, within the cabin air-conditioning distribution system are studied. It was found to be possible to double the existing airflow velocity in the Boeing 747 air-conditioning ducts without violating cabin sound level criteria. It is possible to attenuate airplane noise by lining a fraction of the duct's length with lined steel material, and by proper choice of R/D values for the 90-deg bends upstream of the straight cylindrical ducts. (F.R.)

NP73-3B-008

A73-12282 0


An experimental study was made on the influence of a forward inclination of an actual gun. and of the airfoil section on the reduction of noise generated by an actual firing gun. It is shown that efficiency will be improved and noise level lowered by inclining the barrel. Noise level can be most effectively lowered when the forward inclination angle is 15 deg. Inclination to the starboard is also effective, and the primary varying factor has been decreased by 5 dB at 45 deg of the inclining angle. Efficiency can be improved and noise level lowered by suitably designed rotor control, and by adoption of the design of the lee vortex type of a flow pattern. (F.R.L.)

NP73-3B-009

A73-12833 0


The scope of investigations conducted with coaxial interacting exhausts of flows covers (1) acoustic measurements in both the far noise field and near field noise, (2) surveys of mean flow properties and fluctuation processes, optical visualization of interacting jet flows, the associated flow and shock structure changes, and the noise field, (3) the effects of different geometrical parameters of the coaxial nozzles, and (4) thrust measurements. It is shown that the flow interaction between two suitable controlled interacting coaxial supersonic asymmetric jet flows results in substantial noise reduction based on equivalent thrust considerations. This flow interaction technique appears to be potentially an attractive approach for suppression of noise from supersonic jet exhausts. (F.R.L.)

NP73-3B-010

A73-13062


Questions of the toleration of aircraft noise by the public are considered, giving attention to the concept of the noise contour. The end of the aircraft noise problem is realized only when the area of the critical contour is contained within the confines of the airport. Approaches for achieving this objective are based on the use of quiet engines and improved operational techniques. It is pointed out that the problem of having comfortable engines capable of powering subsonic aircraft which could gradually replace the existing fleets of noisy jet aircraft. Such a replacement program would lead to a reduction of noise exposure areas by at least a factor of five. A further reduction of exposure area could be accomplished with suitable development work directed at a further reduction of engine noise. (G.R.)

NP73-3B-011

A73-13080 0


Results of a group of several analytical studies of nacelles suitable...
for advanced subsonic commercial transport aircraft. The increase in the noise of reduced aircraft noise and impressed noise is due to the measurement and initially developed in terms of the individual noise components: inlet, fan noise, nozzle, etc. This is achieved by relating the noise and cruise speed parameters to which the aircraft system must be designed to specify limitations on the individual noise components. Performance comparisons are then made (separately for each noise component) of conceptual design concepts. Overall noise designs, synthesized on the basis of the individual component studies, are briefly discussed. (Author)

NP73-3B-012

NP73-3B-013

NP73-3B-014

NP73-3B-015

NP73-3B-016

NP73-3B-017

NP73-3B-018

NP73-3B-019

NP73-3B-020
Noise production is described and methods for controlling it are discussed. (Author)

**NP73-3B-021**


Results of the experiments and notice of recent and current work performed or sponsored by NASA in the field of noise reduction technology. Figures of NASA 1971-1972 research elsewhere to accomplish noise reductions of 40 dB have been performed to NASA's Lockheed Research Center in Cleveland. Experimental results obtained in (Cleveland) research resulted, and a necessity performed and finally quiet experimental STOL aircraft design solution. (Author)

**NP73-3B-022**


The aim of this paper is to summarise the results of several years of work on the internal noise of hovercraft. The basic mechanism of noise production is described and methods for controlling it are outlined. A case history is also described. Internal noise measurements from other forms of transport are compared to that of hovercraft, and it is shown that comparatively small overall noise reductions of 4 dBA would make the internal noise of the subject as that of short-haul jet aircraft. Structural-borne noise is shown to be a major source of noise in at least one current production craft. Low structural damping combined with light weight and rigidly mounted machinery are found to be the major causes of structural-borne noise. (Author)

**NP73-3B-023**


The NASA, working with American Airlines, has completed the first phase of research to evaluate the operational feasibility of swing-wing approaches for noise abatement. For these tests, one navigation was used to establish the upper glide slope and on ILS was used to establish the lower. The flight director was modified to provide command information during the entire approach. Test-flight pilots representing the airlines, professional pilot associations, FAA, and NASA participated. With an ILS approach for supersonic, the procedures gave a noise reduction of 18 EPNdB at the aircraft and 8 EPNdB 1 n mile from touchdown. (Author)

**NP73-3B-024**


The principal cause of noise at jet noise is described and methods for controlling it are discussed. (Author)

**NP73-3B-025**


Quiet engines from those of present in use are essential if 1000 Hz and reduced and broadbanding (KTH) terms of aircraft operators can be obtained in the visibility of populated areas. The inherent difficulties in noise reduction for the majority of the areas required. Some problems of the Hush-Rayne RD.211 engine, installed in the Landor Tristar, the quietest of certificated aircraft, are given. A possible future of new engines is the use of conversely chassis (to reduce noise) within the engine itself. Noise, noise, and noise noise, and the noise of the jet limit are evaluated. (Author)

**NP73-3B-026**


Analytic solution of the sonic boom problem for typical aircraft maneuvers in a polytropic atmosphere by means of the analytic method of characteristics. Solutions for singularities in a polytropic atmosphere are derived. Using the analytic methods of singularities and of characteristics, the sonic boom of a body traveling in a periodic air is obtained. The asymptotic Whitham formula for the wave is improved by an explicit formula which gives sufficiently accurate results for distances of about 20 body lengths or more. (Author)

**NP73-3B-027**


It is the goal of NASA to provide the technology that will make the aircraft present in its environment. The primary work in propulsion source noise reduction concerns around the technology to modify existing engines and the technology to design new propulsion systems for CTOL, STOL, and VTOL that operate at significant sonic speeds. NASA's program for a new engine. Another recommendation is demonstrated with the incorporation of noise and pollution technology in military aircraft propulsion developments. (Author)

**NP73-3B-028**

It is shown that focused beams that exist in turning flight can be suppressed by the simple (although not always practical) expedient of disengaging the engine. The correct deceleration will eliminate the local curvature of the wave front responsible for the focusing. Specifically, the tangential deceleration resolved along the normal to the wavefront is adjusted to cancel out the contrapropagation direction resolved. The sonar beams of prescribed limiting diameters are not of concern for this suppression technique: their focused beams will be cut off from reaching the ground by atmospheric absorption. The minimum turn radius for focus cutoff is related in a simple fashion to the tabulated width of the cone beam except for rectilinear flight, as a function of Mach number and altitude. (Further)

Points out necessity of protecting the ears of armed forces personnel against noise and the ears of combat troops against blast without interfering with normal hearing. Measured the shock wave attenuation of a number of different combinations: muslin cloth, polyurethane foams, wire meshes and nylon and cotton net, and presents the shock and acoustic wave transmission characteristics for each. — E. J. Moncada

389. Hughes Tool Co Culver City Calif Aircraft Div OH-6A PHASE II QUIET HELICOPTER PROGRAM.


Descriptors: (Airplane noise, Attenuation), (Helicopters, Airplane noise), Tail helicopter rotors, Rotor blades (Rotary wings), Jet engine noise, Acoustic impedances, Engine mufflers. Flight testing.

Identifiers: Aircraft modification, N-D aircraft, OH-6A aircraft, "Quiet aircraft, Light observation helicopters", Noise reduction.

The report presents the results of the Phase 2 Quiet Helicopter Program. A Hughes OH-6A Light Observation Helicopter was extensively modified to obtain a maximum of quieting. The purpose was to apply the latest known sound-suppression techniques available to industry to an actual helicopter and then to measure the results. An acoustic goal was set which required a balanced treatment of each noise-producing source throughout the full frequency range. Noise reductions ranged from 14 to 20 db depending on the flight conditions. The report describes the detailed configuration changes, the test and development programs, and the final sound level measurements compared to the standard OH-6A. (Author)
The effect of plants on microclimate and noise reduction in the urban environment. Nortscience 7(1): 37-39. Illus. 1973.—Plants have a great impact upon the urban microclimate in contrast to dry structural materials. Infrared surface temperature can be substantially modified by evaporative cooling and the interception of radiant energy by plants to reduce the heat island characteristic of the summer urban microclimate. High temperature characteristic of surfaces such as artificial turf can be reduced by irrigation. Outdoor athletic areas covered with artificial turf should be either irrigated to permit evaporative cooling or shaded to intercept solar radiant energy. Coniferous trees seem capable of providing a small amount of attenuation for environmental noises that are either predominantly low or high frequency in composition. However, dense tree plantings are necessary to achieve effective environmental noise attenuation from vegetation alone in urban areas and the practical value of plants as an urban “sound barrier” appears questionable.

The development of a low-noise constant area throttling device. Ill. (Instrum Soc Am) Trans 10(4): 396-411. Illus. 1979.—With the recent revision to the Walsh-Healey Act, possible high noise levels produced by control valves are a subject to concern to industry. A comprehensive effort to determine an effective and practical approach to reducing aerodynamic valve noise resulted in the development of a fixed area, throttling device designed to reduce the production of aerodynamic noise at its source. This paper evaluates an extensive system analysis of valve noise and investigates the parameters affecting noise through a series of qualitative tests. The influence of effective orifice diameter, system energy losses, resonant damping, and pressure drop variations are discussed. These factors, when properly incorporated in the finished product, result in a substantial and predictable noise reduction. Test results indicate excellent agreement with predicted SPL (Sound Pressure Level) values.
NP73-3B-033


NP73-3B-034

Mounts to reduce tractor cab noise, A. Fl. Hakimi, R Agric Engin 55:370-1, 31 Jul 73

NP73-3B-035


NP73-3B-036


NP73-3B-037

Noise fades into the background when workers wear muffs. K. Gale. II Engineering 222:03 11 8'71
Noise control process equipment.  

See Citation No. 73-1TE-00006 p. 171. [1972?].  
Abs. only, from AA.  

A variety of noise control techniques for common noises encountered in existing refineries and petrochemical plants is examined. The engineering concepts and designs, the materials used, the amount of noise reduction anticipated and/or achieved, and the approximate costs are discussed. A check list, used by one group for actions required by the Occupational Safety and Health Act of 1970 that is based on past experience and the Occupational Safety and Health Act of 1970, is reviewed. Plan surveys, problem area definition, and medical and engineering control are discussed. A multidisciplinary approach is used in which medical, engineering, and operations departments share in the responsibilities for providing a suitable noise environment. The control of furnace and pipeline noise is examined in some detail.

Transit systems: Noise reduction: Regional planning: abstract only: systems analysis.  
To date, new transportation systems have failed to avoid the impact of noise on the surrounding community due to lack of adequate planning in terms of depth of research and analysis; lack of attention to the whole problem of noise pollution; and lack of coordinated planning of communities and the transport system that serve them. Several ways are discussed to achieve greater coordination between community planning and transportation planning in order to reduce noise. A systems approach should include the steps of identification of objectives, identification of programs, prediction of effectiveness, and evaluation of alternatives. Several means of doing this are discussed.

HIGHWAYS : NOISE REDUCTION : MARYLAND : Baltimore : earth berms : barriers : sound attenuation. Noise level prediction of a proposed highway design is explained. Several case histories of highway design and planning in Baltimore (Maryland) are presented and represent difficult urban problems—those not soluble by handbook methods. The design and use of earth berms and acoustical barriers to attenuate noise are illustrated.

Motor vehicle noise generation and potential abatement. The Department of Transportation initiated a study on the magnitude of the transportation noise problem and its potential abatement. Four computer simulation models were developed to establish noise levels which might be expected for different transportation modes as a function of the traffic characteristics peculiar to that mode. An understanding was developed of the technical, economic, and legal limits of potential abatement means for each transportation mode. Results of this study as they relate to motor vehicles are presented. The program of the Office of Noise Abatement of the Office of the Secretary, Department of Transportation, for achieving reasonable noise reduction consistent with an integrated transportation system is also discussed.


A COUSTIC MEASUREMENTS : NOISE REDUCTION : INDUSTRIAL NOISES : MACHINERY : hydraulic units. Noise identification and reduction methods for hydraulic units are discussed. Identification is accomplished through use of the human ear, precision sound level meters, and 1/3 octave band analyzers. Noise reduction can be accomplished by containing it or by 'designing out' procedures such as pump and motor rpm reduction, use of flange mounted pumps, employment of isolators for components and major sub-units, use of manifolds, and use of isolators in hydraulic lines.

Noise in pneumatic tools comes from 2 main sources: discharge to the atmosphere of high pressure air through exhaust outlets, and vibration produced by metallic impact of tool components. Noise reduction in pneumatic road breakers can be accomplished by a hard durable plastic double-chamber silencer. Also available are 2 silenced portable compressors of a type normally used in developed areas and on construction sites to operate road breakers and other hand tools. Silencing is achieved by the following improvements: the glass fiber cannyon is lined with plastic foam combined with antirumming compound, the enclosure is improved by incorporation of trays under the compressor and a transparent gauge panel access door, engine exhaust noise is reduced by a pair of tandem exhaust silencers, a lined cooler duct directs cooling air downwards, and the canopy is flexibly mounted.

Inhabitants of the town of Kelsterbach, Germany, N of Frankfurt airport, are harassed by noise of takeoffs and expansion construction of the airport—especially 45 freight loading places and a new W runway. Construction of a series of hangars, and administrative and clearance buildings, while utilizing 15 m high sound protection wall with a sectioned, horizontal absorption plate on the upper side, was recommended as a practical means to reduce the noise. Because of the nearness of this wall to loading places and runways, this measure aims at sound absorption and deflection resulting in a protective action which is more effective than that of sound protection barriers. The airport administration has resolved to adopt this suggestion and to execute, by stages, construction of the sound protection wall totaling a length of 3.8 km.
Aircraft noise is a nuisance. Conservationists, government research establishments, universities, and industry are working together to minimize the noise nuisance without ruining the economy of the air transportation industry. New aircraft can be made quieter; they may be assessed by means of a "noise footprint," so called because of the footprint-shaped pattern of the ground area exposed to noise in excess of a specified level during take off and landing. Footprint area is directly proportional to the number of people disturbed. Noise curbs for existing aircraft are being studied as well. Better engines and enforcement of noise regulations are helping to alleviate the problem. A low noise engine is described.

**NP73-3B-052**

72-STE-0139

Rink, Charles N., Rink Corp., Hazleton, PA

Noise control in air handling systems. Florida University, Gainesville. Engineering Progress at the University of Florida, 25(1): 49-54, May 1971. Sum. 2 figs. 3 tables. 1 ref. SS

AIR CONDITIONING, NOISE EFFECTS. NOISE SOURCES: NOISE CONTROL: ECONOMICS

Generation, propagation, and control of noise in air handling systems require careful engineering. Unitary air conditioning systems are compared to central station systems. Today's systems incorporate smaller machines, less ductwork and the proper amount of acoustically absorbent material. Information available to sound engineers on sound frequencies, the threshold of hearing, sound curves of equal loudness and annoyance, permissible noise limits for occupational exposures, and sound levels which cause discomfort and pain, is discussed. Causes of unwanted noise in a building's mechanical system are examined, with special emphasis on the fan. Overheating must also be avoided because other mechanical noises then become audible and more annoying to the human ear. The various components which generate sound are described and suggestions are made for achieving more efficient and lower cost systems.

**NP73-3B-053**

72-STE-0148

Warnakula, Glenn E. (hall) Lord Corp., Lord Manufacturing Co., Erie, PA

Zalas, J.M.


NOISE CONTROL, DAMPING: INDUSTRIAL NOISE: structural damping.

Damping, although often used synonymously for attenuation, refers to an energy conversion process where the energy of mechanical vibrations is converted to heat energy. On this basis, damping is shown to be a useful tool for noise reduction where structural resonance or wave propagation at sonic speeds is responsible for noise radiation. Structural damping reduces noise radiation from structures by attenuating both the temporal and spatial components of flexural waves traveling in the structure. Structural damping is further shown to be useful in reducing noise originating from mechanical impact and from steady-state excitation. Examples of the effect of structural damping in reducing the noise from industrial machinery are presented, and data is given indicating the noise control obtained.

**NP73-3B-054**

72-STE-0145

Holinar, C.I. Bolt, Beranek and Newman, Inc., Cambridge, MA

LAGGIA, A National Research Corp., Cambridge, MA


Theoretical and experimental evaluations of some damping treatments utilized to control noise from transfer of materials in a foundry are presented. A theoretical investigation is outlined which indicates that the change in peak radiated sound pressure level from an impact is proportional to the change in mass and stiffness of the impacted surface. The change in total sound power radiated is proportional to the change in mass, stiffness and the loss factor of the impacted surface. The energy noise reduction has application in predicting the reduction of the time average reverberant field sound pressure level from a large number of impacts occurring throughout a period of time.

**NP73-3B-055**

72-STE-0147

Dougie, Leslie L., Montreal, Que., Can.


No abs., numerous figs., 18 tables, 4 appendices, index, numerous refs., SS.

ACOUSTICS: ENVIRONMENTAL ENGINEERING: NOISE CONTROL: SOUND ABSORPTION: book: architectural acoustics. A detailed analysis of environmental acoustics in architectural design is presented for practical application to present-day building practices. Properties of sound and various aspects of room or space acoustics are described. Environmental noise control, including sound-insulating construction, noise criteria, control of mechanical noise and vibration, and noise control in specific types of buildings, is discussed. Detailing, specification and supervision are included.

**NP73-3B-056**

72-SG-0082

Anon.


**NP73-3B-057**

72-SG-0056

National Industrial

Pollution Control Council.

Aircraft and Aerospace

Sub-Council


Abs. 3 figs. no refs. from AS & SS.

The reduction of noise from gas turbine aircraft engines is discussed. The introduction of low-bypass ratio turbofan engines reduces exhaust noise but adds fan tones particularly noticeable in landing. Fan design and acoustic treatment technology for reducing fan noise in high-bypass engines are considered. The high-bypass ratio engine provides good fuel economy and low jet exhaust noise levels.

NP73-3B-058

72-5TI-0682
Macdonald, Howard R. San Diego, CA
Method and apparatus for suppressing the noise of a fan-jet engine (3,673,803).
Filed Oct 6, 1969. Ser. No. 863,786. Int. Cl F02k 1/26; U S. Cl. 60-226 R. 3 Claims.
3B METHODS
(See Also)

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72
3.C MATERIALS
Materials for noise and vibration control.

Korlund Dynamics Corp., Westbury, NY
McAuliffe, Daniel R.
Lead Industries Ass'n., New York, NY
Agne, T.D.
Soundcoat Co., New York, NY
Hammond, Joseph I.

Sum., illus., no refs., from Sum. & Text.


Four types of materials are available for dealing with noise and vibration control problems: sound absorption materials, sound barrier materials, vibration/shock isolation materials, and vibration damping materials. Two or more of these materials are often incorporated in a single commercial product to obtain the benefits of their combined effects. Properties of these materials and their performance when used singly and in combination are discussed. Transformer enclosures, engine test cells, appliance enclosures, railroad wheels, and pipes and values illustrate typical applications of noise/vibration/shock control materials.

Damping treatments for noise and vibration control.

USAF, Materials Lab., Wright-Patterson Air Force Base, OH
Jones, David I.G.

Sum., illus., numerous refs. (1 in Ger.), Sum.


A survey is made of the techniques and materials which can be utilized for the control of noise transmission and vibration induced failure in structures. Consideration is given to dynamic behavior of damping materials as a function of temperature and the effect of various damping treatments on the response and modal damping of a variety of structural elements exhibiting many different stiffness and geometrical characteristics. Examples are given of prior applications of damping to the solution of a variety of vibration and noise control problems, and of materials available for vibration control.

Satisfactory sound insulation between dwellings: A real possibility.

See Citation No. 73-2TE-00049 pp. 292-293, 1971.
In English; Eng., Fr., Ger. sums., refs. from AS.

Netherlands; Eng., Fr., Ger. sums., refs., from AS.

Willigers, L.H.J.
van den Eijk, J.

Publication No. 300.


For satisfactory airborne sound insulation between dwellings, more insulation than the usual minimum requirement in Western Europe is necessary. This goal is attainable if thick external walls and floors are combined with lightweight internal walls. Improved insulation values of 6-9 db were measured in apartments of a building system for social housing.
3C MATERIALS
(See Also)
1C001  3A025  3B025  3B029  3B031  3B033
3. D REGULATIONS AND STANDARDS
NP73-3D-001

772-20614/ Committee on Commerce (U. S. Senate),
NOISE CONTROL ACT OF 1971 AND AMENDMENTS
PAGE 9

The hearing concerning noise pollution and theNoise
Control Act are reported. The comments from the following agencies are included: Department of Interior, Department of State, Comptroller General, Department of Agriculture, Civil Aeronautics Board, National Science Foundation, EPA, and NRC. Additional articles, letters, and statements concerning effects of noise, and sound rating of outdoor equipment are included.

F.D.S.

NP73-3D-002

772-30559/ Committee on Public Works (U. S. Senate),
REPORT TO THE PRESIDENT AND CONGRESS ON NOISE

The effects of noise on living things and property, noise sources and their current environmental impact, and control technology and estimates for the future are considered. The following topics are discussed: auditory, sociological, psychological, and psychological effects; effects of noise on wildlife; effects of sonic boom and other impulsive noise on property; physical effects of noise on structures and property; community noise, transportation systems, devices powered by internal combustion engines; noise from industrial plants; construction equipment and operations; household and building noise; transportation industry programs; noise reduction for industrial plants; construction and asbestos industry; laws and regulatory schemes for noise abatement; government, industry, professional, and voluntary association programs; and assessment of noise concern in other nations. K.P.D.

NP73-3D-003

772-30506/ Environmental Protection Agency, Washington, D.C.
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FROM REPORT TO THE PRESIDENT AND CONGRESS ON NOISE

General observations, conclusions, and the future program are briefly summarized from the study on noise sources, noise pollution, and noise abatement. It is pointed out that noise effects are difficult to define and evaluate and available information on typical exposures is sparse. Noise control technology and possible changes in the noise problem to the year 2000, methodologies for noise measurement and evaluation, and economic implications of noise and noise abatement are mentioned. Recommendations for achieving noise reduction over the next 5 to 10 years are outlined. M.E.E.

NP73-3D-004

772-35367/ Nike Corp., McLean, Va.
A PROTOTYPE STANDARD AND INDEX FOR ENVIRONMENTAL NOISE QUALITY

A prototype technical standard for environmental noise is proposed in terms enabling an index of noise quality to be defined and calculated. The standard takes into account the

3D-001

SUMMARY-STATEMENT OF LIETHROUS EXPOSURE TO LOUD NOISE AS WELL AS PSYCHOLOGICALLY DISTURBING ASPECTS OF TYPICAL COMMUNITY NOISES WHICH ARE NOT LOUD ENOUGH TO BE PHYSICALLY DANGEROUS. INASMUCH AS THE STANDARD IS INTENDED TO PORTRAY ENVIRONMENTAL QUALITY RATHER THAN TO REFLECT DAMAGE RISK CRITERIA, IT IS GENERALLY CONSERVATIVE WITH RESPECT TO WORK RELATED NOISE STANDARDS, SUCH AS THOSE SPECIFIED BY THE WELCH-HEALEY ACT. THE BASIC STANDARD GENERATES A DISTRIBUTION OF NOISE INTENSITIES TO WHICH AN INDIVIDUAL MIGHT BE EXPOSED IN A 24-HOUR PERIOD. THE DISTRIBUTION MAY BE APPROXIMATED BY THE COMBINED DISTRIBUTION OF GAUSSIAN DISTRIBUTIONS WITH MEANS AND STANDARD DEVIATIONS OF 13 AND 3, 150 AND 8.5

Author (GRA)
The report presents the criteria and a proposed standard for preventing occupational diseases arising from exposure to noise. These criteria and the recommended standard were developed by the National Institute For Occupational Safety and Health (NIOSH). A majority of the NIOSH Review Consultants recommended an 85 dBA noise limit with mandatory hearing protection and audiometric testing for the most complete protection. Data are provided in this document which indicate that approximately 14% of workers in manufacturing are exposed to noise above 90 dBA, but no data are available relative to the number exposed to 85 dBA or to the technological feasibility of meeting the proposed 85 dBA standard in a given time period. The present recommendations defer the 85 dBA standard until after an extensive feasibility study and limit mandatory audiometric testing to new employees, with a recommendation that employers consider the costs of a full hearing conservation program.

The report describes the impact that implementing highway noise standards will have. The standards provide for a weighing of the costs of noise abatement measures on a case-by-case basis, including the need for additional land to serve as buffer strips so that in each case there will be a weighing of the use of resources against the benefits achieved. It is possible that the standards may lead to more land being required for future highways. Much of the report consists of responses to the new guidelines.

Recent federal and state guidelines for permissible noise exposure levels have created renewed interest in the industrial noise problem. Reviews the provisions of the noise criteria, discusses the role of the otologist, and calls attention to areas of inconsistency and conflict in the medical legal evaluation of hearing loss claims.—J. Abst.
NP73-3D-012
Paccagnella, B.
Ann Santita Pubbl. 52:509-6, Nov-Dec 71 (Ita)

NP73-3D-013
Noise-exposure: the legal viewpoint.
Fredriksen, R.
Trans Am Acad Ophthal. Otolaryngol 75:1272-82,
Nov-Dec 71

NP73-3D-014
New industry anti-noise law requires hearing tests and sound controls.
Ind Med Surg 41:34-5, May 72

NP73-3D-015
Next, federal cleanup target: aircraft noise and emissions.
Envir Sci & Tech 8:520-8
Mar '72

NP73-3D-016
Noise control and government regulation.
H. V. Semling, Jr.
Foundry 100:53-3 F 72
Noise pollution.


Abs., illus., refs., from AA.


Urban noise and its general impact on the environment are discussed. Methods by which noise levels can be measured or calculated are presented. and the physiological and psychological effects of urban noise on man are considered. Major local sources of noise, including air surface transportation systems, residential sources (apartments, playgrounds, and neighborhood pets), and commercial and manufacturing sites are discussed. Policy recommendations for the reduction of urban noise levels given include: adopt a quantitative noise standard for operations at Los Angeles International Airport, limiting noise levels to 90 Phn (perceived noise level) or lower at the airport boundary; modify the westerly take-off pattern at the airport to effect its extension to the west, apply an 85 Phn standard to all commercial helicopter operations; propose the passage of stricter quantitative noise standard and enforce current noise regulations governing motor vehicle operations; requiring the use of acoustical insulation in all new residential buildings; and adopt quantitative noise standards governing all construction equipment operating in the city.


Several lectures and discussions from the meeting of the Institute for Noise Control in Internal Combustion Engines held in January 1972 are summarized. Topics reviewed include noise standards, source isolation, attenuation factors, measuring procedures, and methods for reducing noise levels of combustion, fans, mufflers, hydraulic systems, and other components.

Legislation et reglementation sur le bruit, 6 pages(1971?).

In French; no abs., no refs., from Text.


Regulations and legislation on noise in France are surveyed. Special rules for the soundproofing of buildings and maximum noise levels for motor vehicles in different categories are specified. The frequency of airports is divided into zones according to sound intensity. The maximum noise levels recommended for housing areas are presented as well as suggestions for new regulations of machines, engines, industrial noise, protection of workers, and insulation of buildings.

The enforcement program was preceded by several years of studies, legislative proposals, and evaluations of procedures, before enforcement by instrumentation (sound level meters) was feasible. Because of the detailed preliminary planning, the law operated very well and produced significant results. Noise teams were trained and judges and district attorneys were consulted before initiating the enforcement program in different areas of the state. The first enforcement efforts resulted in a number of new vehicle models, both muscle cars and trucks, being recalled by manufacturers for restyling with quieter exhaust systems. Yearly reductions were made in levels in one or another part of the noise law based on compromises between desired levels of quieting and the numbers of vehicles that might have to be reworked if particular levels were enforced.

Coal mine noise standard enforcement under the provisions of the Federal Coal Mine Health and Safety Act. See Citation No. 73-ITE-00006 p. 170. [1972?].

Abs. only, from AA.


Various aspects of implementing the noise standard are discussed, including a history of the noise regulations, training of mining industry personnel, requirements of the industry and the bureau, and the treatment of violations.

The existing authority and responsibilities of the Environmental Protection Agency's (EPA) noise control program and its impact on federal, state, and local governments are discussed. The role of the Office of Noise Abatement and Control is considered. Proposed standards and regulations are considered and a synopsis of a report to the President and Congress on the national noise problem is discussed, including some of the salient data, conclusions, and recommendations. Noise control and abatement measures which the EPA will undertake to protect the health and welfare of the public are also included.

Legislation et reglementation sur le bruit, 6 pages(1971?).

In French; no abs., no refs., from Text.
A survey of governmental agencies, studies and publications concerned with the environment of the Southern California coastal zone. Los Angeles, University of Southern California. Sea Grant Program, Publication No. 272, 150 pages, Jan. 1972.

No abs., illus., numerous refs., from Text.

Grant: NOAA 235227.


Agencies, activities, and studies are cataloged. The listings include state agencies and local governments in Los Angeles and Orange counties, as well as selected resource libraries for government publications located in the Los Angeles area. A bibliography of government reports on air resources, land use, solid waste management, noise abatement, and water pollution is included.

NP73-3D-024

73-1TE-00032

Mayo, Lous H., George Washington Univ., School of Law, Wash., DC

Consideration of environmental noise effects in transportation planning by governmental entities.


Abs. only, from AA.

Also in: Society of Automotive Engineers. New York. Section Papers No. 720627.

TRANSPORTATION NOISES: NOISE REDUCTION: GOVERNMENT REGULATIONS: abstract only.

The increasing public concern in recent years over the problem of environmental noise has resulted in the enactment of technology-based regulatory agencies and statutory measures to control technological applications. Most of the earlier controls, however, were reactive measures rather than positive efforts to assure development of a new technology in the public interest. This situation is beginning to change as new environmental codes are being implemented in various states and cities. A description is presented of how the noise factor has influenced the planning of transportation systems by various legislative and regulatory entities at the federal, regional, state, and local levels.

NP73-3D-025

73-1TE-00035

Cooper, A.S., California Highway Patrol

California laws and regulations relating to motor vehicle noise.


Abs. only, from AA.

Also in: Society of Automotive Engineers. New York. Section Papers No. 720555.


Reasonable and effective laws for the enforcement of motor vehicle noise were enacted and successfully applied in California. Specific laws to prohibit both sale and operation of noisy vehicles were necessary. Measurements by both instruments and human ear judgments are practical and necessary at this time. Noise limits would be gradually reduced commensurate with the needs of the public and the capability of the technology. Future controls on noise producing components, in addition to the complete vehicle, appear to be necessary to obtain desirable maximum levels. California has pioneered interim solutions to portions of this environmental problem and has developed the expertise along with the practical experience to achieve further advancements in solving the problems.

NP73-3D-026

73-1TG-00040

Anon.

An environmental conservation element for the Los Angeles city general plan.


Abs., illus., refs. for various papers, from Text.


A comprehensive review and analysis of environmental issues in Los Angeles are presented. It is a framework through which governmental and private agencies and citizen groups can perceive interrelationships between various aspects of environmental problems. Specific policy recommendations needed for formulation of additional standards and legislation pertaining to environmental quality are provided, and guidelines for modification of city procedures so as to minimize the negative impact of city operations on the environment are given. Areas covered are air pollution, water quality, noise control, land resource conservation, solid waste disposal, and pesticides. Factors affecting the particular issue, dimensions of the problem locally, measures currently being taken to alleviate the problem, and policy recommendations are discussed for each area.

NP73-3D-027

73-1GO-00043

Anon.


No abs., illus., no refs., SS.


The problems of noise, its damaging effects, and the need for noise pollution control are discussed. Governmental action related to noise control in Illinois is described, including the comprehensive Illinois Environmental Protection Act, new regulations proposed for adoption by the Pollution Control Board, the work of the Illinois Division of Noise Pollution Control, and the prosecution of noise violators.

NP73-3D-028

73-1TG-00097

Torrey, J.D., U.S. Dept. of Labor, Denver, CO

Some preliminary experience with the Occupational Safety and Health Act in the Rocky Mountain region.

See Citation No. 73-1TG-00053, p. 194. [1972].

Abs. only, from AA.


The Williams-Steiger Occupational Safety and Health Act was signed into law on Dec. 29, 1970. Most of its health provisions became effective on Aug. 27, 1971. The states in Region VIII have a normal complement of industries excluding the Maritime. Response to complaints and normal plant inspection work indicated exposures to common contaminants as well as noise and exotic materials. CO, free silica, nuisance dust, and welding fumes are some of the commonplace materials. Polyurethane foams, pesticides, and organic solvents represent some exotics. Citations were issued for alleged violations of the noise standards and occupational health and environmental control standards in both the construction industry and usual industrial production or service plant.

Abs. only, from AA.
Also in: Society of Automotive Engineers. New York. Section Papers No. 720646.

TRANSPORT SYSTEMS: EMISSION CONTROL: NOISE LEVELS: abstract only: Personal Rapid Transit systems. Qualitative and quantitative data on the relationship of emerging Personal Rapid Transit systems and the environment are presented. Specific reference is made to comparison of these systems with the U.S. air pollutant inventory and with the automobile. Thermal pollution and reduction of power supply requirements for these transit systems are considered. Definition and quantification for interior/exterior noise levels, in comparison with other transportation modes and with background conditions, are provided. Visual aesthetics of guideway, station, and vehicle design are presented as the most challenging remaining problem in the integration of Personal Rapid Transit systems into the society.


In English and German: no abs., no refs., SS.

NOISE REDUCTION: GREAT BRITAIN: Noise Abatement Society.

The Noise Abatement Society (Great Britain) was formed to eliminate excessive and unnecessary noise from all sources. Concerns and actions of this group are in the areas of present noise law enforcement, new laws, educational programs, public health effects, machinery noise, aircraft noise, and traffic noise.

The conquest of noise in Finland. See Citation No. 73-2TE-00049 pp. 32-33. 1972.

In English: Eng., Fr., Ger. sums., refs., from AS & SS.

NOISE REDUCTION: LEGISLATION: FINLAND

Noise reduction legislation in Finland is briefly reviewed. The 1958 Finnish Law on Safety in Work considers occupational health and noise abatement in industry. In 1966, the Finnish Council for Air Conservation and Noise Abatement was appointed: the council is responsible for dealing with general problems concerning air pollution and noise abatement. Conservation of nature in 1970 created several committees for the planning of how to increase the efficiency of noise legislation.


No abs. no refs. from Text & SS.

NOISE CONTROL: LEGISLATION.

As a source of environmental pollution, noise is not presently
receiving as much attention as industrial waste or automobile exhaust, but it is a subject of growing concern. To indicate the nature and scope of this issue, the law as it now stands as related to the problem of noise is examined. Whether the law provides effective means of regulation and control is analyzed.

NP73-3D-036

72-STE-0153

Patacchini, S.A.
Univ. of Bath, School of Engineering, Eng
Criteria and standards.
See Citation No. 72-STE-0148. 14 pages. 1972.
£6 abs., 4 figs., no refs. from introd.
NOISE STANDARDS: INDUSTRIAL NOISE: INTERNATIONAL COOPERATION: GREAT BRITAIN.
Almost every major industrial country has issued standards relating to noise. Noise measurement and criteria. A high degree of standardization and similarity between national standards was achieved by the International Organisation for Standardisation (ISO) where participating countries agreed on a common new standard and then based their national standards on ISO. British standards are either identical with ISO, or have some differences to suit particular conditions. Noise criteria are generally not standards (although the method of derivation is) and are usually either recommendations which cannot be legally enforced or Acts of Parliament which can be legally enforced. All British Noise Standards are considered; most commonly used criteria applicable to industrial noise are described fully.

NP73-3D-037

72-5GD-0538

Anon.
Noise control.
Sum. only. from Sum.
The Organisation for Economic Cooperation and Development Council agreed on a proposal recommending measures to reduce and control urban traffic noise. The report will be published under the title "Urban Traffic Noise — Strategy for an Improved Environment."

NP73-3D-038

72-5GD-0540

Anon.
Aircraft noise.
Sum. only, from Sum.
Also in: Sammelblatt 877. 1971.
AIRPORTS: NOISE SOURCES: LEGISLATION: GERMANY: summary only.
A law to control aircraft noise came into force on March 31, 1971. It defines areas around civil and military airports outside which operators are limited to a low level of noise and it prohibits development of certain amenities (hospitals, schools, etc.) in the areas around airports.

NP73-3D-039

72-5GD-0541

Anon.
Environment.

NP73-3D-040

72-5GD-0542

Anon.
Noise control.
Sum. only, from Sum.
The Canton Luzern enacted a law to control noise levels for the protection of health. It will be enforced beginning July 7, 1971.

NP73-3D-041

72-5GD-0544

Anon.
Environment.
Sum. only, from Sum.
SST: LEGISLATION: AIRCRAFT: summary only: United States.
A bill that could lead to the banning of all supersonic airliners in the USA was introduced in the House of Representatives. It would make it unlawful to operate a supersonic aircraft unless the government agencies are satisfied that its operation would not have detrimental effects on people on the ground or on the environment.

NP73-3D-042

72-5GD-0547

Anon.
Noise.
Sum. only, from Sum.
Also in: De Monde 36, May 29, 1971.
NOISE CONTROL: LEGISLATION: SST: NEW YORK: summary only.
The State Senate approved an anti-pollution Act which includes control of noise, including aircraft noise. It could be used to prohibit the landing of supersonic aircraft.

NP73-3D-043

72-5GD-0551

Hildebrand, James L., Harvard Univ., School of Law, Cambridge, MA
Noise pollution: An introduction to the problem and an outline for future legal research.
Noise Pollution: An Introduction to the Problem and an Outline for Future

AIRPORTS: SITING CRITERIA: NOISE CONTROL: LEGAL ACTIONS.
The siting of airports is discussed, with emphasis on problems created by land use and noise. Legal actions in New York and Odes County, Florida, are discussed, and the liability of airlines regarding noise control is examined.

NP73-3D-048
72-5GD-0850
Lewicki, Carol Knapp
Environmental Science and Technology, Wash., DC

AIRPORTS: SITING CRITERIA: NOISE CONTROL: LEGAL ACTIONS.
The siting of airports is discussed, with emphasis on problems created by land use and noise. Legal actions in New York and Odes County, Florida, are discussed, and the liability of airlines regarding noise control is examined.

NP73-3D-049
72-5GD-0687
Anon.
Blei Stressenraarm Entschadigung fur Schallsschutzaufwendung. Frankfurter Allgem. 9, June 14, 1972.
In German; no abs., no refs., from Text. (22¾ col. in.)

NOISE SOURCES: NOISE STANDARDS: AUTOMOBILES
GOVERNMENT REGULATIONS: GERMANY: indemnity: newspaper article.

Owners of homes located on new or rebuilt federal roads will be able to claim indemnity for soundproofing when the traffic noise reaches a certain level, according to a new law. Indemnity will be paid by the state when traffic noise causes equivalents exceeding 75dB, measured on the exterior walls of the houses during a representative period.

NP73-3D-050
72-6TE-0183
Mayo, Louis H.
Ware, Robert C.
(both) George Washington Univ. Program of Policy Studies in Science and Technology, Wash., DC

The evolving regulatory structure of environmental noise abatement and control.


No abs., 20 refs., from Text.


The evolution of laws and regulatory structures to control environmental noise is discussed. Sources, regulatory efforts, and trends in the private sector, and at the local, state, and federal levels are investigated.

NP73-3D-051
72-6TE-0164
Cohn, Louis F.
Kentucky Dept. of Highways, Noise Abatement, Frankfort
Anon. (both) Univ. of Louisville, Dept of Civil Engineering, KY.

Development of a federal traffic noise control law.
See Citation No. 72-GE-0169 pp. 529-532, 1972.


The necessity of developing a federal traffic noise control law is examined. The results of noise level profile studies are discussed in terms of providing the technical basis for the drafting of a Kentucky traffic noise control law that would be applicable nationwide. Recommendations for vehicle noise limits are made and methods for the enforcement of standards are suggested.

NP73-3D-052

72-6TE-0189
Murphy, John N. (all) USBM, Pittsburgh Mining and Safety Research Center, Industrial Hazards and Communications Group, PA.

Progress in noise abatement.
See Citation No. 72-6TE-0169, 19 pages [1972?].
Abs. 7 figs., 4 tables, 3 refs. from AA.


The mandatory noise standards developed in response to the Coal Mine Safety and Health Act of 1969 specify maximum personnel noise level-time exposures for underground coal mines. The Act further specifies that personal protective devices shall not be used to meet the standards where the protective devices may otherwise impair the safety of a miner; this specifically refers to the use of earmuffs or plugs that would impair the ability to hear warning signals in the mine. A personal audio dosimeter developed to assess an individual's exposure to intermittent vs multiple coal mine noise is described. A discriminating earmuff which in the absence of noise allows the wearer to hear low-level warning signals is also discussed, as is the development of noise abatement and control techniques for underground noise sources, particularly pneumatic drills.

NP73-3D-053

72-6TE-0170
Bose, B. (both) Jadavpur Univ., Dept. of Mechanical Engineering, Calcutta, India.

Noise and community. Environmental Pollution and Its Control. Seminar. Abstracts. ( Held in Baroda, India, April 15-17, 1972). Institution of Engineers (India), Baroda Sub-Centre, p. 24 [1972?].
Abs. only, from AA.

NOISE MEASUREMENTS : NOISE CONTROL : INDIA: abstract only.

The environmental noise problem is examined by discussing procedures for assessing noise annoyance, control methods, and other aspects of noise pollution.

NP73-3D-054

72-6GD-0550
Anon.

Sum. only, from Sum.


NOISE CONTROL: SST NORWAY DENMARK SWEDEN summary only

Unified laws will be introduced in the parliaments of Norway, Sweden, and Denmark in Jan. to prohibit all supersonic flights over Scandinavian territory.

NP73-3D-055

72-6GD-0578
Anon.

Sum. only, from Sum.


NOISE CONTROL: SST: LEGISLATION: NORWAY: summary only.

The parliamentary transport committee of Norway approved the Government Bill to prohibit supersonic flight by aircraft over Norwegian territory.

NP73-3D-056

72-6GD-0578
Anon.

Sum. only, from Sum.

Also in: International Herald Tribune: 3, June 8, 1972.

SONIC BOOMS : LEGAL ACTIONS: summary only: property damage United States.

The U.S. Supreme Court ruled that the government is not liable for property damage caused by the sonic booms of high-flying military planes. This decision reversed a lower court order that held the government liable in damages caused by Air Force jets.

NP73-3D-057

72-6GD-0578
Bluecher, Goesta National Board of Urban Planning, Sweden

The evaluation of traffic noise in Swedish urban and regional planning - from research to norms.
In English: sum., 1 fig., data table, 1 ref., from Text.

A final draft of planning guidelines for traffic noise, submitted in Jan. 1971, recommended that the effective indoor noise level in a dwelling unit should not exceed 35 db in the daytime and 25 db at night. The draft also recommended that traffic noise within playground and recreational areas not exceed 55 db. Other recommendations are given for suitable limits in factories, offices, schools, and hospitals, together with outdoor recreational areas attached to those areas. The guidelines also account for the means available to highway engineering and physical planning to achieve the desired protection against noise, and they include a simple estimation model for prediction of noise levels, given a particular planning situation, which would appear when the plan layout is adopted. The effects of these norms as presented in the guidelines on urban and regional planning are evaluated.

NP73-3D-058

72-6GD-0760
Anon.

Sum. only, from Sum.
A federal anti-noise program which includes provisions to prohibit commercial supersonic flight over the U.S. and its territorial waters was proposed in the Senate.

NP73-3D-059

72-6GD-0783
Meyer, Michael B. Environmental Affairs, Inc., Brighton, MA
Air and noise pollution surrounding airports: East Haven v. Eastern Airlines, Inc.
No abs., 93 refs. from Text.
AIR POLLUTANTS: NOISE CONTROL: AIRPORTS: LEGAL ACTIONS:
East Haven v. Eastern Airlines, Inc.

Rights of property holders near airports to a quiet and clean environment have increasingly come into conflict with whatever rights the public has to relatively unrestricted air travel. In East Haven v. Eastern Airlines, Inc., the United States District Court for the District of Connecticut dealt with such a conflict, and ruled for the public's right to relatively unrestricted air travel. The court's decision is subject to three major criticisms. Most importantly, it does not recognize nuisance as legal theory most applicable to complex controversies involving airports. In addition, it does not recognize trespass as an appropriate legal theory for dealing with invasions of property by either aircraft or physical agents. Finally, the court's decision limits the class of property holders who may recover and allows only for money damages, an inadequate remedy in view of the continuing nature of the problem.

NP73-3D-060

72-6TG-0794
Anon.
Environmental health planning.
No abs., 1 fig., 1 table, numerous refs., from Intro. & SS
GOVERNMENT PROGRAMS: URBAN REFUSE: PUBLIC HEALTH:

This manual is intended to guide state and local environmental health planners and managers in development of appropriate and effective programs through systematic planning, either for the development of new programs or the evaluation and upgrading of existing ones. Basic planning information is provided, as well as special considerations relating to planning state or local programs in each of the principal environmental health areas. The specific areas covered include air, water, solid wastes, radiation, noise, vectors, pesticides, the residential environment, institutions, injuries, occupational health, recreation, food, drugs, therapeutic devices, and cosmetics.
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4. PHYSICAL EFFECTS OF NOISE
NO CITATIONS THIS ISSUE
4. B STRUCTURAL
NP73-4B-001

NP-200287 Advisory Group for Research Aerodynamics of Longitudinal Flow (AGARD) 28635

The effects of acoustic fatigue test on the test panel and the other test panel damage of the test panel. A method of estimating the noise field sound pressure level due to high velocity jet noise is described, including the limitations. Methods are described to predict the first two groups of natural frequencies of jet and simple curved slin-droplet arrays with four different and conditions. The parameters determined are: (1) acoustic transmissivity, (2) aspect ratio of the jet noise, and (3) the number of half-waves across the flow path. A method of calculating the root mean square of a randomly chosen panel in response acoustic loading is presented. Author

NP73-4B-002

NP73-4B-002

NP-200287 National Aeronautics and Space Administration, NASA Goddard Space Flight Center, Greenbelt, Md.

AERODYNAMIC DAMAGE CLAIMS RESULTING FROM ACOUSTIC ENVIRONMENT DEVELOPED DURING STATIC TEST Firing OF ROCKETS ENGINES 227

Stanley W. Guzew and Robert W. Slamo, Jr. In Re NASA Rock
d Test Technical Conf. 1972 p 23-80 (For availability see NP73-20039 21-31)

DAMG 21H

During static testing of multi-million pound thrust rocket engines and adjacent structures the noise and vibration subject to the noise and vibration caused by rocket engines. Structural damage claims and subjective complaints were filed by those who allege that the noise levels were excessive. The statistical analysis of these claims and complaints which were filed during the rocket engine development programs led to the determination of a relationship between claims and overall sound pressure level. Community exposure criteria are then assessed based on what can be considered allowable acoustic environments from large rocket engines. Author

NP73-4B-003

NP73-4B-004

NP-200287 NASA Ames Research Center, Moffett Field, Calif.

THE EFFECTS OF LONGITUDINAL DAMAGE ON THE STRUCTURAL DAMAGE OF LONGITUDINAL PANELS 247


A study was conducted to assess the effects of noise and vibration, and the parameters, such as excitation, duration, and mechanical damage, which can cause structural damage. It is followed by an evaluation of the effects of excitation, particularly buildings, on noise excitation and a review of the damage history observed due to structural damage. A summary of the structural criteria of importance relating to sound and mechanical damage is included. Author

NP73-4B-005


THERMAL PROTECTION OF INTERNAL ENGINES AND STRUCTURE OF ROCKETS TO SPACE TRAVEL ENGINES 247

W. E. Bear and L. W. Anderson, 1968 p 170-75

NASA Langley Research Center, Hampton, Va.

This report describes a procedure for predicting the thermal damage and thermal stresses of particles in a particle structure in a thermal environment using laboratory techniques. The objective is to examine the effects of thermal damage properties on the performance of structures in a thermal environment. The thermal effects of thermal damage and the effects of thermal damage properties on the performance of structures in a thermal environment. Author

Author

Author
NP73-4B-006

73-1TE-00023
Mahig, J.
Elliott, H.J., Jr.
Gentile, R.J.
Noise and vibration transmission floors and walls.
No abs., illus., no refs., from Text & SS.

NOISE REDUCTION : VIBRATIONS : BUILDINGS : CONFERENCES :
concrete slab transmission.
An experiment determined the noise and vibration levels caused by pumps and motors in a building, and definite frequency band pass region existed for a concrete slab. The vibrations of the floor slab decayed rapidly to 10% of its amplitude at the source and only slightly thereafter at frequencies above 100 Hz, and the noise level in the room could be significantly affected by force input into the floor slab. The wall was not affected transversely by floor vibrations of the amplitude considered, and significant transmission losses would occur if the slab were not continuous at the wall and if the wall did not have substantial contact with the joints.

NP73-4B-007

73-2TE-00083
The effect of sonic bangs on buildings.
See Citation No. 73-2TE-00049 pp. 289-291. 1971.
In English; no abs., no refs., from Text & SS.
TRANSPORTATION NOISES : AIRCRAFT : BUILDINGS : GREAT BRITAIN :
sonic boom effects.
The wave motion from a single boom with an extra overpressure of 1 lb/ft² has a sharp rise at the beginning and a gradual fall away. The wave motion of a sonic boom of the magnitude tested over London recently differs in that it has a 2nd shock wave immediately following the 1st which creates the characteristic double boom. One of the difficulties with sonic booms is the peculiar shape of the double boom, inducing resonance, thereby considerably increasing the effective power of the boom. Adverse effects on building components such as plate glass, steel, masonry, or timber, are briefly considered. The most serious point and a real concern which has not yet been studied is that of the cumulative effect of prolonged vibration from sonic boom impulses which will occur if they become part of everyday life. Specifically, the effects of sonic booms on historical structures in Great Britain are considered in light of the economics involved in preserving the landmarks vs supersonic transport.

NP73-4B-008

72-660D-0677
Anon.
Noise.
Sum. only, from Sum.
NOISE SOURCES : SST : PUBLIC HEALTH : UNITED KINGDOM :
summary only.
Britain's sub Committee for Environmental Conservation's recent report states that there is now sufficient circumstantial evidence to indicate that supersonic flying over land on a large scale is likely to cause damage to old buildings, and severe disturbance to people, birds, and animals, and lead to widespread public alarm.
4B  STRUCTURAL
      (See Also)

3B011  3C002

960
4.C ENVIRONMENTAL
NP73-4C-001


External acoustics environments, structural responses, noise reductions, and the internal acoustic environment have been predicted for a typical shroud/spacecraft system during lift off and various critical stages of flight. Spacecraft responses caused by energy transmission from the shroud and mechanical and acoustic paths have been compared and the importance of the mechanical path has been evaluated. Theoretical predictions have been compared extensively with available laboratory and in-flight measurements. Equations laboratory acoustic fields for simulation of shroud response during the various phases of flight have been derived and compared in detail. Techniques for varying the time-space correlations of laboratory acoustic fields have been examined, together with methods for varying the time and spatial distribution of acoustic amplitudes. Possible acoustic testing configurations for shroud/spacecraft systems have been suggested and trade-off considerations have been reviewed. The problem of simulating the acoustic environments versus simulating the structural responses has been considered and techniques for testing without the shroud installed have been discussed.

NP73-4C-002


Computations of the pressure as a function of time conducted by Witham (1950) for the sonic boom are considered. The computations showed the existence of a wave consisting of two compressive shocks. The calculation had been performed on the basis of idealized conditions. Deviations of the real temporal pressure relationship from the ideal relations obtained by Witham are discussed, giving attention to a broadening of the shock and to statistical fluctuations of the sonic boom parameters. Phase changes in the wave were further investigated by studying the scattering of an ideal wave in a suitable model atmosphere, giving attention to low and high frequencies.

NP73-4C-003

The propagation of a weak nearly plane shock wave through a slightly inhomogeneous medium was studied. The equations for a finite strength shock wave are used as a starting point in order that the cumulative effect of second order terms will not be lost. The motivation for the study was the experimental observation that atmospheric turbulence can alternately focus and defocus weak waves from an aircraft. A more detailed understanding of the influence of atmospheric turbulence on this problem was sought. The basic equations are derived, and some preliminary results are obtained. (Author)

A major environmental effect of supersonic flight that sets it apart from other aircraft operations is the sonic boom. The wave pattern that travels with the aircraft—rather like the bow wave of a ship—sweeps over underlying areas and mimics the advancing shock wave of a mild explosion. Impelled by the prospect of civil supersonic transport (SST) aircraft, there has been a great volume of research on the sonic boom and its effects, particularly during the last decade. The state-of-the-art as of 1965 was summed up in the first Sonic Boom Symposium sponsored by the Acoustical Society of America, held in St. Louis. The state-of-the-art as of 1970 was largely summed up in the second Sonic Boom Symposium held in Houston five years later on 3 November 1970. The 1970 Symposium consisted again of a series of invited papers, for the most part of a survey nature. The authors were drawn from the international community of researchers on sonic boom and its effects. (Author)
4C ENVIRONMENTAL
(See Also)

1E035  2A001
5. SOCIAL EFFECTS OF NOISE
5.A GENERAL
NP73-5A-001

Environmental Protection Agency, Washington, D.C.

NOISE ABATEMENT AND CONTROL. VOLUME 1: CONSTRUCTION NOISE
Avail. NTIS $0.75

The public hearings on construction noise are reported for Atlanta, Georgia. The statements of 33 witnesses are presented and include discussions on hearing loss, noise control in office buildings, noise in industrial plant construction, and noise control in construction equipment.

F.O.S.

NP73-5A-002

Environmental Protection Agency, Washington, D.C.

NOISE: THE ULTIMATE INSULT
Avail. NTIS HC $3.00

The inhumanity of man's noise in the cities is protested. The effects of noise on animals forced to listen to noise are briefly discussed. The traditional use of noise to ridicule, embarrass, denigrate, and curse is contrasted with silence being used for worship, respect, anticipation, and love. It is concluded that the cities have destroyed nature, and created a tumult of noise borne of their demands for every convenience, every novelty, and every protection from exposure.

F.O.S.
Community reaction to airport noise

A report describing a study of the relationships of large numbers of various physical, psychological, and social-with community reaction to the noise of aircraft around international airports in large United States cities. The seven major airports involved were Logan International-Boston, O'Hare International-Chicago, Dallas International-Dallas, Stapleton International-Denver, Los Angeles International-Los Angeles, Miami International-Miami, and Kennedy International-New York.

Preferred noise criterion (PNC) curves and their application to rooms; L.L. Beranek (Bolt Beranek and Newman Inc., Cambridge, Mass.), W.E. Blazier, J.J. Figueroa; J Acoust Soc Am v 50 n 5 pt 1 Nov 1971 p 1223-8: A new set of noise criterion curves were developed to specify acceptable noise levels in rooms occupied by human beings for specifying noise-control design goals. The new criteria are a modification of those published by L.L. Beranek in 1957, specifying lower levels and new octave bands. Data are given for recent noise-control projects in office buildings and theater-concert halls.
A report of research having 3 interrelated objectives: (a) to evaluate the social basis for the existence of noise pollution; (b) to investigate methods of abating noise and the status of the noise abatement programs; and (c) to assess the subject of noise as an urban environmental health problem, noting consciously perceived as well as insidious effects. Surveyed, by questionnaire, 2 communities in Pennsylvania and the responses to the survey and noise measurements of the communities represent most of the data reported here. Describes his method for evaluating the health hazard of noise in a community and presents a model showing how noise can be managed. Includes a bibliography of over 500 items arranged in 6 major categories: noise, general; physical effects; psychosocial effects; law; noise abatement; and noise sources.—l. M. Ventry

On the basis of the literature and own investigations, emphasizes that noise (industrial, domestic), threatens health. Neurosensory elements of the organ of hearing proved to be affected by noise. Sudden noise acts negatively on the function of the cardiovascular system causing vascular contraction. Refers noise to an intermediate stress. A more severe form of atherosclerosis of the aorta developed in animals subjected to the action of noise than in control animals. Considers that the loudness of many sources of noise can be diminished by technical means and believes that measures for effective control of noise should be introduced. 16 ref.—J. Abst.
NP73-5A-007

NP73-5A-008

NP73-5A-009

NP73-5A-010

NP73-5A-011

106
No abs., illus., indexes, no refs., from Text & SS.
Contract: EPA 68-01-0512.

**NOISE REDUCTION: FEDERAL PROGRAMS: EPA hearings: research abstracts.**

The prevention, abatement, and control of noise are considered. A noise ordinance enacted by the city of Chicago and an information retrieval system being used by the U.S. Environmental Protection Agency are described. A digest of EPA hearings is provided, along with abstracts of research on noise emission and suppression; physiological, psychological, and sociological effects of noise; economic aspects of noise control; building acoustics; measurement methods; planning, design, and architectural siting; legislation, standards, and legal precedents; enforcement and educational techniques; and government programs.

**CONSTRUCTION INDUSTRY: NOISE REDUCTION: abstract only.**

Construction noise accompanying the rehabilitation of old and the development of new transportation modes is extremely destructive to the quality of life, and the environment. With few exceptions, industry has failed to internalize the cost of muffled equipment and procedures, and the cost of this intense noise exposure is an 'external cost' borne by both the worker and the exposed public. Engine equipment manufacturers, contractors, and project sponsors resist design for quiet. Engineers have an ethical imperative to protect the noise receiver. Citizen demand for quieter construction is growing and a few manufacturers are voluntarily marketing quieter compressors and paving breakers. Government, on all levels, is beginning to raise the question of unlimited noise emissions. The Walsh Healey noise exposure limits are now applicable to construction operations. Industry should be given financial incentives and assistance to expedite the necessary change-over to design and operation for quiet.

**NOISE CONTROL: LEGAL ACTIONS: book.**

The measurement of noise is discussed, along with its destructive effects on the human mind and body. Methods of combating noise pollution (including legal actions) are described.
5A GENERAL
(See Also)

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5.B BEHAVIORAL
NP73-5B-001

PSYCHOLOGICAL EFFECTS OF PROLONGED EXPOSURE TO SONAR SIGNALS AT AN ELEVATED INTENSITY. 3: TWENTY-FOUR DAYS EXPOSURE TO SIGNALS AT 85 DB INTERIM REPORT


AID-2545103, RSMR-0811 Avail. NTIS CSL 08/18

Ten carefully screened male subjects, 5 from each of the North London community and 5 Navy personnel were excluded in the audiology spaces of the Submarine Medical Research Laboratory for a total of 30 days, 4 pre-exposure (no booms), 20 days, exposure to the 85 db peak and 2 recovery days. Administered daily, the test battery consisted of a sequential reaction time test, a hand-eye coordination test, a measure of muscular tension and 4 measures of mood and affect. Although in 8 of the ten men some depressive trends occurred in the first 3 days of the exposure period, the performance data demonstrated no evidence of significant improvement. Similarly, while 3 men reported mild re-occurring headaches, and 5 indicated the booms may have affected their sleep as well as their performance on certain testing procedures, the overall adjustments of the 0 men did not appear to be impaired allowing 1/2 - 3 days for adaptation. Author (NRA)

NP73-5B-002

PSYCHOLOGICAL EFFECTS OF NOISE ON PEOPLE

31 Dec 1971 105 p. revs

[Contact EPA-76-01-05000114] Avail. NTIS RC 01023

It is shown that noise can act as a source of psychological distress, either because of reactions directly to the noise itself or because of responses to irrelevant messages carried by the sound. Psychological distress in turn contributes to the various unpleasant effects on hearing loss, speech interference, fatigability, anxiety, stress, etc. 0.B.

NP73-5B-003

RESIDENT PERFORMANCE EFFECTS OF SIMULATED SONIC BOOMS INTRODUCED DURING SLEEP

W. Dean Gaines and Georgetta West May 1972 5 p. revs

[Contact EPA-73-01-05030] Avail. NTIS HC 03200

Twenty-four male subjects were tested on a complex performance device involving monitoring, mental arithmetic, and pattern discrimination. Three age-groups were used: 20 to 28, 40 to 45, and 60 to 72. Subjects were tested for 30 minutes each morning and each evening for a 21-day period. On the sixth through the 17th nights, subjects were exposed to eight simulated sonic booms with an outdoors overpressure level of 1.0 psf presented at 1-hour intervals during sleep. The results provided no evidence that exposure to simulated sonic booms during sleep produced measurable consequences with respect to complex performance. A significant age effect was found for five of the ten measures. Significant differences (apparently a learning effect) were found in performances across the three phases (pre-boom, boom, and post-boom). There was also a significant interaction between age and phase for five of the measures. Analysis of the simple effects revealed there were no significant differences among the three groups at the beginning of testing with the differences decreasing for the two latter phases. The time of day effect was significant for five of the measures. Author.

NP73-5B-004

NP73-5B-005


Social surveys were conducted in 24 areas with well-defined noise exposure characteristics around eight airports in Scandinavia. The results demonstrate that the extent of annoyance reactions in an exposed population is closely correlated to the noise levels of single overflights. For areas exposed to a low number of takeoffs, an increase in the extent of 'very annoyed' is found already when the noise level increases from 70 to 76 dB(A). The increase with noise levels up to 85 dB(A) is linear (correlation coefficient 0.99). (Author)
28401. BREGMAN, HOWARD L. and RICHARD G. PEARSON. (N. C. State Univ., Raleigh, N. C., 27697, USA.) Development of a noise annoyance sensitivity scale. NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) CONTRACT NERF CR(194): 1-40. rdius. 1972.--Examinating the problem of noise pollution from the psychological rather than the engineering view, a test of human sensitivity to noise was developed against the criterion of noise annoyance. Test development evolved from a previous study in which biographical, attitudinal, and personality data had been collected on a sample of 166 subjects drawn from the adult community of Raleigh North Carolina, USA. Analysis revealed that only a small subset of the data collected was predictive of noise annoyance. Item analysis yielded 74 predictive items that composed the preliminary noise sensitivity test. This was administered to a sample of 80 adults who later rated the annoyance value of 6 sounds (equated in terms of peak Sound Pressure Level) presented in a simulated home, living-room environment. A predictive model involving 20 test items weighting scheme was evaluated.--J. F. L

NP73-5B-007

15072. MOREIRA, NAOMI M. and M. E. BRYAN. (Audiol. Res., Unit, Dep. Elect. Eng., Univ, Salford, Salford M5 4WT, Engil, UK.) Noise annoyance susceptibility. J SOUND VIB 21(4): 449-462, Illus. 1972.--The variations of annoyance due to tape recorded noise were investigated in a group of 34 normal hearing subjects. There were significant differences between subjects in their rating of 3 different types of noise, 20 sec samples of which were played at levels varying from 55-95 dBA [noise rating vs. noise level]. Subjects were stable in their judgments of annoyance over a 2 mo. period. Those subjects most sensitive to noise showed greater initial annoyance but their annoyance grew less rapidly with increasing noise level than that of those least sensitive to the noise. The former tended to have steeper loudness functions than the latter. While sensitivity to annoyance by noise (or noise annoyance susceptibility) does not appear to depend upon such personal factors as age, sex, education, job responsibility, nor such personality traits as determined by the EPQ [Eysenck Personality Inventory] and the MMPI [Minnesota Multiphasic Personality Inventory] it is apparently quite strongly related to various measures of personality given by the Rorschach Projection Test. A tentative personality profile of a noise sensitive individual is proposed and some support for this is found from noise annoyance field studies and from individual loudness function data. In order to predict an individual's annoyance to a particular noise, it may be necessary to know not only the level of the noise but also his personality.

NP73-5B-008


--J. F. L
NP73-5B-009


Examines the motives of those people joining associations aimed at the control and reduction of aircraft noise. Pressure groups have increased in their sophistication and now seem able to exert powerful influence upon the authorities.—J. Abst.

NP73-5B-010

The effect of interruption rate on the annoyance of an intermittent noise.

An experiment designed to test a prediction made from the Noise Pollution Level (LNP) formulation is described. During each test session of 30 min, subjects were exposed to 15 min of road drill noise at 87 dBA, the experimental variables being the number and duration of the noise bursts. The results were broadly consistent with the formula when compared with experiments using steady noise, but secondary effects are found which depend on the intermittancy rate. The results are used to illustrate a psychophysiological model of noise annoyance, and are also discussed in relation to the noise fluctuation term in the LNP formula. Of the personality indices taken, extraversion was the only measure to show significant effects.

Electroencephalographic and behavioral effects of nocturnally occurring jet aircraft sounds.

Data relative to the objective evaluation of the effects of a specific complex auditory stimulus presented during sleep are presented. The auditory stimulus was a jet aircraft flyover of approximately 20-sec duration and a peak intensity level of approximately 80 dB(A). The physiological effects (changes in electroencephalographic, EEG, activity) produced by the jet aircraft stimuli outlasted the physical presence of the auditory stimulus by a considerable degree. Both behavioral and EEG changes were noted during waking performances subsequent to nights disturbed by the jet aircraft flyovers which were not apparent during performances subsequent to undisturbed nights. Even limited exposure to nocturnal stimuli which do not necessarily produce behavioral awakening can nonetheless produce significant changes in an individual's pattern of sleeping and waking EEG and overt waking performance.

The anatomy of the human ear and the behavior of man and animals in an exceedingly noisy environment is discussed. The effect of distance sound levels and sound-intensity level phenomena is considered in studying the noise problem acoustically. Several protective and preventive measures for industrial workers and people associated with noisy machinery are suggested. It is recommended that the noise problem be studied psychologically as well as statistically.
**5B** BEHAVIORAL
(See Also)

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5.C HEALTH AND PERFORMANCE
NP73-5C-001

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

NP73-5C-002

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

NP73-5C-003

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

NP73-5C-004

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

NP73-5C-005

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

NP73-5C-006

A study of the effects of noise on human performance. The results of this study suggest that noise levels in the range of 75 to 85 decibels can produce a significant decrement in performance. The study was conducted with a sample of 50 subjects, and the results indicate that the decrement in performance is greater for tasks requiring high levels of concentration and attention. The study also suggests that the effects of noise on performance are greater for tasks requiring fine motor skills. The results of this study have important implications for the design of work environments and the protection of workers from the effects of noise.

Author (GNA)

Measurement of the closed-loop compensatory tracking performance of the human operator in terms of the environmental stress of a 95-db white noise, using the critical tracking task of Jex et al. (1966). Following a description of the equipment and subject methodology, the results obtained are shown to indicate that the zero-order Jex task performance measures of total time and critical divergence frequency are sensitive to noise stress, whereas the switching time is not. These results suggest that control and human factors engineering researchers in environmental stress must be extremely careful in their selection of performance measures. M.W.E.


To determine whether high intensity broadband noise has an adverse effect on human performance when special conditions related to type of task, length of testing, and intensity of noise exposure are met, 3 groups of 20 subjects each were tested on a serial search task. The first group was presented continuous broadband noise, the second received intermittent noise, and the third served as a control group. Performance was measured for 38 min continuously on a practice day and 4 test days. Both noise groups produced approximately the same results. Both groups found significantly fewer numbers on the task than the control group on the last two days of testing. The results support the contention that when certain conditions of testing are met, a reliable effect of noise on performance can be demonstrated. (Author)

NP73-5C-010

AB-97-09

Environmental Acoustics Center

EVALUATION OF HEARING LEVELS OF RESIDENTS LIVING NEAR A MAJOR AIRPORT.

Final rep.,


TP FAA-ND-72-72


Identifiers: "Noise pollution, Los Angeles International Airport."

Audioscopic and other data related to noise conditions and noise exposure were obtained from residents living in the noise environment of the Los Angeles International Airport. Data collection covered all of the noise environment of the airport, including the greater Los Angeles area. Noise contamination included Los Angeles International Airport noise and that from other sources in the greater Los Angeles area. Additional measurements of these aircraft noise conditions in the neighborhood ranged from 70 to 106 dBA, with a median of 82 dBA. Two weeks contiguously was similar to the airport one in noise levels and the significant aircraft noise exposure. Noise levels were commonly 106 dBA and sometimes over 100 dBA.

NP73-5C-011

AB-97-11

Environmental Acoustics Center

EVALUATION OF HEARING LEVELS OF RESIDENTS LIVING NEAR A MAJOR AIRPORT.

Final rep.,


TP FAA-ND-72-72


Identifiers: "Noise pollution, Los Angeles International Airport."

Audioscopic and other data related to noise conditions and noise exposure were obtained from residents living in the noise environment of the Los Angeles International Airport. Data collection covered all of the noise environment of the airport, including the greater Los Angeles area. Noise contamination included Los Angeles International Airport noise and that from other sources in the greater Los Angeles area. Additional measurements of these aircraft noise conditions in the neighborhood ranged from 70 to 106 dBA, with a median of 82 dBA. Two weeks contiguously was similar to the airport one in noise levels and the significant aircraft noise exposure. Noise levels were commonly 106 dBA and sometimes over 100 dBA.

NP73-5C-012

AB-97-02

Environmental Health Lab Institute AFU CER

EVALUATION OF HEARING LEVELS OF RESIDENTS LIVING NEAR A MAJOR AIRPORT.

Final rep.,


TP FAA-ND-72-72


Identifiers: "Noise pollution, Los Angeles International Airport."

Audioscopic and other data related to noise conditions and noise exposure were obtained from residents living in the noise environment of the Los Angeles International Airport. Data collection covered all of the noise environment of the airport, including the greater Los Angeles area. Noise contamination included Los Angeles International Airport noise and that from other sources in the greater Los Angeles area. Additional measurements of these aircraft noise conditions in the neighborhood ranged from 70 to 106 dBA, with a median of 82 dBA. Two weeks contiguously was similar to the airport one in noise levels and the significant aircraft noise exposure. Noise levels were commonly 106 dBA and sometimes over 100 dBA.

The overall findings did not make it possible to draw firm conclusions about community aircraft noise exposure at a cause of the apparent differences in hearing levels between the two groups. (Author)

Undertook to evaluate, under carefully controlled clinical conditions, the relative damage potential of rock music, symphonic music, and band-limited white noise. Exposed 10 normal hearing Ss to each program source for 60 min. at an average SPL of 95 dB binaurally through electrostatic headphones. After each exposure, obtained a TTS by Bekesy audiometry at each of 10 frequencies. An octave-band analysis demonstrated that both the rock and symphonic music had very similar frequency spectra, being within ±4 dB from 125 Hz-8000 Hz and having maxima at 500 Hz. The TTSs for both rock and symphonic music were nearly identical with maximum TTSs from 2000-5000 Hz and averaging 8-10 dB. The white noise, being richer in high frequencies, produced average TTSs of 11-17 dB for the same test frequency range.—J. Abst.


Explains habituation of the auditory system to strong, permanent noise. Measured the stapedius reflex in 105 persons suffering from noise-induced hearing-loss with frequencies from 0.5-4 KHz, and compared it with the threshold of discomfort. It appeared that only the latter in noise workers was raised (transfer of the habituation to permanent noise immission to the test stimuli of the loudness tolerance test). Correspondingly, the difference level stapedius reflex threshold vs. threshold of discomfort was raised from normally 10-20 dB to 30-50 dB; at least 2 yr. after the end of the noise exposure, the difference level was found normal again or even decreased by recovery of the threshold of discomfort. The stapedius reflex threshold remained in the normal level range, even in the frequency band of greater hearing losses. Hence, the hair cell responds to great sound intensities with an unchanged metabolic expenditure. Only the central rating of strong noise is habituated; the peripheral receptor remains in unchanged susceptibility to acoustic overload. There is no habituation of the inner ear; the inhibitory efferents are not able to provide an effective protection against metabolic exhaustion—and consecutive degeneration—by the nonbiological noxae of industrial noise. 18 ref.—J. Abst., ed.


Results of hearing conservation program instituted for participants in gunnery course. Incidence of high-frequency hearing loss was reduced by 16% after start of program. Discusses problem of reassignment of moderately hearing-impaired servicemen.—I. Shapiro
4465. Thackray, Richard J. (FAA, Civil Aeronautical Inst., Oklahoma City, Okla.) Sonic boom exposure effects II: Startle responses. *Journal of Sound & Vibration.* 1972. Vol. 20, 519–526.—Reactions of both humans and animals to impulsive acoustic stimuli, including sonic booms, may involve startle reflexes or orienting responses. The former usually tends to disrupt performance; the latter may actually facilitate it. The lack of consistent findings in the literature regarding the effects of sonic booms on performance may reflect a general failure to differentiate between these 2 basically different types of reaction. Thus, objective criteria for distinguishing startle from orienting reactions and methods for measurement are suggested. Relevant stimulus parameters of impulsive stimuli and other factors which may modify the evoked reaction are discussed. Suggestions are offered for needed research. (35 ref.)—W. E. Collins.

5411. Young, I. M., & Habert, F. (Jefferson Medical Coll., Philadelphia, Pa.) Noise effects on speech discrimination score. *Journal of Auditory Research,* 1970 (April). Vol. 10(2), 127–131.—Studied effects of ipsilateral and contralateral presentation of masking noise on speech discrimination (DS) scores of 7 normal-hearing Ss, 65 Ss with unilateral total hearing loss and normal hearing in the opposite ear, and 15 Ss with bilateral symmetrical hearing loss. Speech and noise were combined and presented monaurally. The normal and the bilateral-loss group yield similar results: a DS greater than 70% when the signal/noise (S/N) ratio is +5 db and higher, and less than 50% when the S/N ratio is −5 db and lower. Ss with unilateral total hearing loss require a S/N ratio about 10 db higher to approximate the DS obtained by normals.—P. N. Herman.
psychosomatic diseases.--M. F.

NP73-SC-019

NP73-SC-020

NP73-SC-021

NP73-SC-022

NP73-SC-023

NP73-SC-024

NP73-SC-025

NP73-SC-026

NP73-SC-027
showed the highest loudness. The influence of the 0.03 and 1.0 examined. A "paired comparison" method was used. perceived hindering causing a considerable change of the auditory adaptation. balance disturbance, including vertical nystagmus, and have deep toxicology function. This leads to the formation of a stable effect of external Levels of infrasound in moving vehicles can produce symptoms of hypokinesia depends primarily on the state of the sections of the auditory analyzer. Relative isolation and hypokinesia tangibly influence the analyzer function. This leads to the formation of a stable effect of external hindering causing a considerable change of the auditory adaptation.

NP73-5C-029

† 46318. ABE, L. SHARON M. (Dep. Psychol., Univ. Toronto, Toronto 181, Ont., Can.) Duration discrimination of noise and tone bursts, J. Acoust. Soc. Am. 51 (Part 2): 1219-1223. 1972. --The human observer's ability to discriminate a difference in duration for noise bursts was investigated. The observers compared 2 durations (T and T+2T) in a 2-alternative forced-choice procedure. The value of T ranged from 0.05-0.00 msec. For each T the value of 2T for 75% discrimination was determined. For most of the range investigated a T was proportional to 1/T. Performance was not affected by a change in bandwidth from 3500-200 Hz. Values of 2T for 75% correct did decrease when the observers were given audible special cues from very short pulses sinusoids. The theory best describing the results was a neural counter model.

NP73-5C-030

51661. SIEPELIN, O. P. (Vladivostok. Med. Inst., Vladivostok, USSR.) Kompleksnaya otsenka uslovii truda i ponyatkov v protsesse polevykh rabot. [Electroencephalo-graphic investigation of tractor operators working under field work.] GIG SANIT 36(10): 106-107. Il'ias, 1971. 850p. - EEG data are given for 16 tractor operators working in the field under conditions of intense noise, vibrations and other factors which have a considerable effect on the functional state of the CNS. -N. B. S.

NP73-5C-031

5C-037

SRUGLOV, N. P., V. A. LUTOV, A. L. PINCHUK and G. G. SOROCHINSKII. (Dep. Gen. Hyg., Vitebsk Med. Inst., Vitebsk, USSR.) Voprosy gigieny truda v shvicinnoi pravdovosti. [Industrial hygiene problems in the sewing industry.] GIG SANT 37(9), 22-25. Illus. 1971. [Engl. sumnr.]--A study of industrial conditions prevailing at a sewing factory proved the technologic process was accompanied by certain noxious environmental factors. The main factors are the unsatisfactory microclima in the sewing shops, significant levels of high-frequency noise and a considerable strain of attention, vision and neuro-motor apparatus in fulfillment of monotonous production line operations. All this has a considerable effect on the physiological reactions, the state of health and the work productivity. --E. S.

5C-038

SCHNEIDER, BRUCE A. (Columbia Univ., New York, N. Y. 10027, USA.), ALLEN J. NEUERGER and DOUGLAS RAMSEY. Magnitude estimation of loudness with a minimum 24-hr interstimulus interval. PSYCHONOMIC SCI. SECT. HUM. EXP. PSYCHOL. 27(4): 243-245. Illus. 1972.--Magnitude estimates of the loudness of white noise were obtained in 2 conditions: in the 1st, the time between consecutive stimulus presentations was at least 24 hr; in the 2nd, the time was less than 2 min. In both conditions, the relationship between the reports of the subjects (Ss) and the intensities of the stimuli was best described by a power function. The exponent of the function was lower and the variance was slightly greater in the 24-hr interstimulus condition.

5C-039

WAHI, P. N. (Indian Counc. Med. Res., New Delhi, Delhi, India.) Noise pollution and health. INDIAN J. MED. RES. 59(7): 1148-1153. 1974.--Many possible sources of noise pollution are reviewed. Possible fetal and infant damage of humans and rodents, hearing impairments, and the relationship between coronary ailments and mental disorders and noise are stressed. --S. G. B.

5C-040

TARASENKO, N. Yu., A. A. KASPAROV, E. M. SMIRNOVA and B. V. ANAN'EV. (I. M. Sechenov Ist Med. Inst., Moscow, USSR.) O kombinirovannom deistvii faktorov vneshnei sredy na proizvodstve i ikh normirovani. [Joint action of environmental factors in industry and their standardization.] GIG SANT 36(7): 27-32. Illus. 1971. [Engl. summ.]--In the chemical industry, the action of toxic substances prevails on a background of other occupational noxious factors (noise, high air temperature). Hygienic investigations carried out in boric acid production proved that noise intensity was at a permissible level, but the functional state of hearing in workers presented a number of unfavorable shifts. The 80th curve, accepted as a standard of permissible noise level, is quite unfit for a number of chemical productions. In winter time, the air temperature of work shops did not exceed 27-29°, but signs of thermoregulatory stress were observed in the workers. The standardization of the microclimate in the chemical industry should be regulated on the basis that workers experience a joint action of factors. --J. L. S.

5C-041

SHAPIRO, MARK T., WILLIAM MELNICK (Ohio State Univ., Columbus, Ohio, 43210, USA.) and VICTOR VER MEULEN. Effects of modulated noise on speech intelligibility of people with sensorineural hearing loss. ANN. OTOL. RHINO. LARYNGOL. 87(8): 241-248. Illus. 1972.--Twenty-four adult male subjects, 12 with normal hearing and 12 with sensorineural hearing loss, were tested to compare their speech discrimination in quiet and in a noise background. The wide-band noise used was either continuous or modulated and was presented at various signal-to-noise ratios. The speech test material was monosyllabic words. Subjects with sensorineural loss showed markedly poorer discrimination under all experimental noise conditions. Performance improved as the signal-to-noise ratio increased and as the modulation rate decreased. The poor discrimination of subjects with sensorineural hearing loss


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Temporary threshold shifts produced by pure tones and by noise in the absence of an acoustic reflex. J. H. Mills and D. J. 1554-8 pt 2 F 72

NP73-5C-062
Noise exposure: the industrial physician. Barbor CI.
Trans Am Acad Ophthalmo Otolaryngol 75:1383-71.
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to acoustic trauma). Maister EJ.

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Temporary threshold shift in hearing from exposure to different noise spectra at
equal dBA level. A. Cohen and others.
Bibl Acoustical Soc Am 31:503-7 pt 3
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Temporary threshold shifts produced by
noise exposure of long duration. Carder TN. et al.
Trans Am Acad Ophthalmo Otolaryngol 75:1346-54.
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NP73-5C-067
Growth and recovery of temporary threshold shift at 4
kHz due to steady state noise and impulse noises.

NP73-5C-068
Effects of noise, tranquilizer and increased delay time
of tracking performance and heart rate. Strasser H.
Pfluegers Arch 332:Suppl 332:R52, 1972
Effects of varying levels of interruption on temporary threshold shift. See Citation No. 73-1TE-00006 pp. 139-140. [1972?].
Abs. only, from AA.
Intermittency is a noise exposure variable which must be considered in proposing standard limits. A noise interruption is a period in the noise exposure when the level falls below 80 dBA for more than 5 min or for 20% of the duration of the preceding noise burst. Interruption levels below 80 dBA may have variable effects on resultant temporary threshold shifts. Thirty subjects were exposed to noise bursts wherein the only variable was the level of noise during interruption. The resultant temporary threshold shifts from these exposures are discussed.

Survey of chain saw operators: Nature of intermittent noise exposure and associated damage risk to hearing. See Citation No. 73-1TE-00005 p. 140. [1972?].
Abs. only, from AA.
Intermittent noise exposure is an occupational hazard that is difficult to identify and monitor. Depending on job or machine operations interruption intervals can range from a fraction of a second to an hour or more, while the number of these interruptions might vary from one to thousands. Since hearing can recover to some degree when a noise exposure is interrupted, resultant shifts in hearing thresholds can be variably affected. A survey was conducted of U.S. Forest Service workers employed as chain-saw operators. Types of intermittent exposures, resultant temporary threshold shifts and subsequent recovery rate, and hazard risk related to proposed standards associated with intermittent noise exposures were studied.

Survey of hearing conservation programs in industry. See Citation No. 73-1TE-00006 p. 140. [1972?].
Abs. only, from AA.
Excessive noise at the workplace poses risk of hearing loss to workers. The occupational noise exposure standard in effect under the Occupational Safety and Health Act directs industry to develop programs for the purpose of conserving workers' hearing. Because there are no generally accepted standards for such programs, the National Institute for Occupational Safety and Health conducted a survey to find ongoing industrial hearing conservation programs and to assess the extent and nature of their variability to learn of the range of problems involved in establishing such programs, and to determine apparent measures of effectiveness. Forty-three hundred questionnaires were sent out; as of Dec. 1, 1971, responses were received from 62% of the mining companies, 56% of the manufacturing companies, 55% of the transportation companies, and 40% of the construction companies.

An evaluation of a hearing conservation program—a five-year longitudinal study. See Citation No. 73-1TE-00006 p. 141. [1972?].
Abs. only, from AA.
A longitudinal study of noise and hearing loss was undertaken in the du Pont Company to evaluate the company's hearing conservation program. About 30,000 men and women, of whom about 7,000 work in areas where the noise levels are above the company's hearing conservation criteria, were studied. Findings of changes in hearing threshold levels over a 5-yr period are presented. Changes among nonexposed workers are compared with those among workers in 2 levels of noise exposure.

Relation of hearing impairment to noise exposure and age. See Citation No. 73-1TE-00006 p. 141. [1972?].
Abs. only, from AA.
An equation relating prevalence of impaired hearing to age and noise exposure is based on the assumptions that the probability of developing impaired hearing at any age is proportional to the fraction of the population of that age which has already developed impaired hearing. The probability of impairment is also proportional to the fraction of the population remaining unimpaired and, therefore, is available for impairment. The solution of the differential equation resulting from these assumptions reveals a complex relationship of age and noise exposure to impairment. The effects of age and noise are not simply additive as is often assumed.

L'importance de la protection acoustique. See Citation No. 73-1GD-00017. 1 page. [1971?].
In French; no abs., no refs., from Text.
NOISE REDUCTION: PUBLIC HEALTH: physiological and psychological effects.
The effects of noise pollution are surveyed, considering the resulting physiological and psychological fatigue. Permanent fatigue without relaxation or recuperation can lead to irreversible injuries. Noise must not be considered an inevitable nuisance. A solution to the problems requires education and regulations to reduce noise levels where its production is inevitable and in sure areas, such as homes, sufficient quiet where recuperation is possible.

All Austrian hearing troubles caused by noise and measured audiometrically are classified in 4 groups according to their cause and extent. It clearly appears that the risks of hearing troubles are

Abs., 5 figs., 4 tables, 4 refs., from AA.


NOISE MEASUREMENTS : VIBRATIONS : PHYSIOLOGY : stress effects

As a follow-up to an earlier study of combined heat, noise and vibration stress, the same levels of heat (120°F), noise (105 dB) and vibration (5 Hz, 0.30 peak g) were studied but with some modifications. Physiological measures included skin and rectal temperature, heart rate, weight loss and biochemical urine analyses. Performance measures included two-dimensional compensatory tracking, choice reaction time, a voice communication test of logical alternatives, mental arithmetic, visual acuity and subjective ratings of the stress conditions. As in the previous study the combination of stresses produced no additive stress interactions. On tracking and reaction time tests the greatest impairment of performance was produced by vibration alone. Transmissibility of vibration was not altered by heat or noise. Subjective ratings of stress severity progressively increased with the number of stresses in the combination. Subjective ratings of stress intrusiveness, however, did not show such a trend.

NP73-5C-079

72-STE-0160
Sommer, Henry C. (both) Aerospace Medical Research Lab., Wright Patterson Air Force Base, OH

Combined effects of noise and vibration on mental performance as a function of time of day.


Abs., 4 figs., 3 refs., from AA.


To determine combined effects of noise and vibration on mental performance as a function of time of day, 10 subjects were randomly exposed to each of the following conditions: stress (5 Hz vibration-0.25 g, 110 dB noise) at 6:00 a.m., no stress (no vibration-85 dB noise) at 6:00 a.m., stress at 3:00 p.m.; and no stress at 3:00 p.m. Subjects' performance on a mental arithmetic task was measured during each of these exposures on consecutive days. Significant interaction between time of day and stress was due to both a slight improvement in performance in no stress condition at 3:00 p.m., and a slight decrement in performance at 3:00 p.m. in the stress condition. Results suggest that phase of the circadian cycle may be a variable to be considered in studies on the effects of stress on human performance.
5C HEALTH AND PERFORMANCE
(See Also)

1A003  1D018  2C001  3D002  3D017  5A003  5A012
1B011  1D019  3A012  3D007  3D040  5A005  5B001
1D012  2A002  3A013  3D009  3D046  5A006  5B002