NOISE POLLUTION

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JANUARY 1 THROUGH MARCH 31, 1973

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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

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| Noise Pollution |
1. NOISE SOURCES
1.A GENERAL
NP73-1A-001

BELGIAN ENVIRONMENTAL RESEARCH INDEX

National Center for Scientific and Technical Documentation, Brussels, Bel.',

Research index only, SS.

AIR POLLUTION . WATER QUALITY . NOISE CONTROL . SOLID WASTES . PESTICIDES . BELGIUM . research index.

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

CARLESTAM, GOSTA. (Linsegatan 81, Stockholm 0, Swed.)

Noise: The scourge of modern society. ANIBIO 10(): 103-106. Ilm. 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, an airplane for example, will disturb more and more people in consequence of urbanization. Urban man is more or less constantly exposed to sounds from a technology-created environment and because of the biological adaptation of human bodies this leads to a so-called stress reaction. The mental process determines exposure to disturbing noise (significant) or more noise (sound level). In the article those problems are discussed in connection with how urban and regional physical planning can eliminate the negative effects of aircraft noise for the 119,000 residents around Arlanda airport in the Greater Stockholm area.

NP73-1A-003


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.
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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 car 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 externally visible assembly and glass manufacturing plants are important sources of community noise. Airflow noise from surface transportation on highways 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 examined.

Design and experimental data on the sound power of the inlet noise were compared for the compressors of several stationary gas turbine plants. It appears that in spite of the different locations of the first stages of several full-scale compressors, the parameter $\delta$ (the dimensionless similarity criterion) changes insignificantly.

This paper describes the interaction between the viscous wakes of successive blade rows in an axial-flow turbomachine. It is shown that wakes-wakes interactions produce regular spatial variations in the unsteady velocity field, and therefore have a significant influence on the generation and propagation of internal noise. The discussion is supported by noise measurements and flow observations at low speed in a single-stage axial-flow compressor.

The behaviour of some important aspects of fan noise is both highly complex and paradoxical. By using a qualitative theory based on the work of Kaji and Ohashi, however, it is possible to predict the behaviour in the forward case of the tonal noise from the compressive interaction of the fan rotor and stator. In this paper the theory is developed and extensive results from a fan operating at subsonic tip speeds (although designed for supersonic operation) are used to justify and illustrate the theory.
NP73-1B-005

2005. NAREBACI, R. (Imp. Chem. Ind. Med., Sydenham St., Bloo-
bury, London, Eng., UK.) and H. J. STOKES. A potential new band

NP73-1B-006

51672. GONCHARENKO, V. P. Analysis of noise produced by compressors used in glass industry and

NP73-1B-007

[Characteristics of noise in mechanical wood
processing shops at cellulose-paper plants]
Marinencek MY. Gig Sank 25:116-7, Oct 71 (Eng)
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.

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

The problems of defining noise sources besides 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.

NOISE LEVELS: INDUSTRY: MACHINERY: INTERNAL-COMBUSTION ENGINES: RURAL AREAS: NETHERLANDS: gas compressor station. Ommen, has operated for 1/2 yr with 4 compressor units of 15,000 hp each, driven by gas turbines. The station is situated in a rural environment in which it was necessary to fix the permissible noise levels at 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.

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

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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. BAAD (Carrier Corp, Syracuse, NY); J Acoust Soc Am v 50 n 5 pt 1 Nov 1971 p 1393-6; Communications to the Editor make a plea for uniform sound ratings 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] 
Leblonk 12. 
Farmacia 29: 86-8, Sep-Oct 71 (Eng. Abstr.) (Rare)
1C HOME. OFFICE AND NONINDUSTRIAL
(See Also)

1A004  3B034  3B055  3D017  3D032  4B006  5C013
3A007  3B052
1. D URBAN
NP73-1D-001

DEVELOPMENT OF SIMULATED NOISE FROM AIRCRAFT OPERATIONS AT NORMANDY
SANTA AIR STATION, CALIFORNIA AND LAND USE INTERPRETATIONS
Dec. 1971 81 p. rept. (Contract NASL-71-C-0701)
(AD-7400391, BSF-2900) Amt.: NTIS CECI 30/1

The purpose of this report is to define the noise environment due to military aircraft operations in the vicinity of Normandy Santa Air Station. The noise environment is depicted by means of contour maps which are interpreted in terms of suggested impact on land usage. The major purpose of the study is to provide interpretations of the aircraft noise on an area in the compatible development of land surrounding Normandy Santa Air Station.

Author (USAF)

NP73-1D-002

AIRPORT NOISE AND LAND USE ANALYSES
Nov. 1972 60 p. rept. Sponsored by HUD
Aa.: NTIS: HC 54 50

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 usage around the three major air carrier airports in the case 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 used 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.

Author
NP73-1D-003


Noise level measurements at 150 locations around the Osaka airport are discussed. Effective Continuous P considers Noise Levels (ECPNL) are given for eight aircraft types. A noise level contour map and a diagram of noise duration allowances vs aircraft distances are given for the airport.

V. Z.

NP73-1D-004


The procedures and results of a repeat location survey assessing the problem of combined aircraft and traffic noise are discussed. Correlations with various noise exposure units are examined. The results indicate slight 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 pollution level seems to offer the possibility of a promising method for predicting dissatisfaction due to combined noise sources.

M.V.E.

NP73-1D-005

A73-12997  Noise. 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 limits 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 (plus 6) PNdB for busy noise events per day. Ideally, this noise level should fall within the aircraft boundary or on nonresidential land.

M.V.E.

NP73-1D-008


Comment on the recent noise certification of the L-1011 Tristar jet transport under the noise standards of the Federal Aviation Regulations (FAR) Part 25. Previous noise levels below FAR Part 25 limits could not be met, and the noise of the jet at such lower levels was undesirable to the passengers on board the aircraft. The noise level at the community was not reduced by the jet transport. The noise level at the community was confirmed that these levels have been obtained, making possible a significant improvement in the community noise environment created by the jet transport.
A noise survey was conducted to determine whether background noise conditions existed within construction, form, or military vehicles. A check was also made on the levels created by public transportation vehicles, such as buses, taxis, trucks, and private automobiles. Tramma noise conditions were found to exist at eight of the construction and form employment. The military design vehicles also observed some instances of extreme noise. The public transportation vehicles were generally free from any extreme noise conditions. (Author)

The noise of the XG4551 and XD4814 1.14-ton cargo trucks was evaluated with the vehicles moving and stationary. The normal operational noise levels in the cabs of both vehicles exceeded the levels recommended in the HEL standard S-1-63 because of excessive transmission noise. In the XD4814, there were also other noises at excessive levels, but their sources could not be isolated. Unless engine noise is reduced, personnel will not be able to use "direct voice" or "intercom-type communications in these vehicles. (Author)

The test vehicles are described in a description of the Community/Army Efficient Development Model (CASEDM). These can be used to evaluate a wide variety of conditions and operations. (Author)
Highway noise. A design guide for highway engineers. C.G. Gordon (Holt Rinehart and Winston, Los Angeles, Calif., W. J. Gallo-Way, B. A. Kugler, D. L. Nelson; Highway Res Ed, Nat Comp Highv Res Program Rep 117, 1971, 79 p). The report discusses and compares different analytical and experimentally derived models of traffic noise, and describes 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, soundproof barriers, elevating or depressing the roadway, gradients and different road surface conditions, and the presence of intervening buildings or foliage between the observer and the noise source. Several approaches to the evaluation of criteria for traffic noise. 33 refs.

Acoust Soc Am 51:1781-94, Jun 72
Diesel engine noise control in the 1970s.


No abs. illust. refs. from Text A & S.


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. 75-1TE-00006 p. 127 (1972).

Abs. only, from AA.

TRANSPORTATION NOISES: OCCUPATIONAL HEALTH: MOTOR VEHICLES: NOISE REDUCTION: abstract only; trucks.

Truck drivers may be exposed to high noise levels while driving. The source and characteristic 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 N.A. under all driving conditions (with closed windows and air vents).

Noise generated by trains of the Chicago Transportation Authority were studied and analyzed relative to occupational health hazard and speech interference. Tape recordings of noise occurring inside of train cars were obtained under various operating conditions. Frequency of occurrence and cumulative distributions of sound intensities were developed through instrumental analysis of the tape recordings. Analyses were measured in terms of over-all sound pressure level, dBA, and sound intensity in each of the octave bands. In some cases, daily noise exposures exceeded the limits recommended by the American Conference of Governmental Industrial Hygienists and specified in the Walsh-Healy Act. Years of daily exposure to these noises had adverse effects on the hearing acuity of a portion of the train crew. Speech interference is extensive on these trains. Some portion of the passengers probably develop a small amount of temporary hearing shift in a single trip, yet it is unlikely that any will develop noise induced permanent threshold shifts from this source.

Community noise survey of greater Vancouver.


Abs. illust. refs., from AA & S.


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-month 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.
NP73-1D-023

72-STE-0049

Anon.

Urban traffic noise: Strategy for an improved environment.


NP73-1D-024

72-STE-0148

Delany, M.E.

Copeland, W.C.

Payne, R.C.

Propagation of traffic noise in typical urban situations.


Field measurements were carried out to investigate the propagation of traffic noise for 10 different road and housing configurations. The shielding produced by a substantial brick wall parallel to a main road, and 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.

NP73-1D-025

72-SGD-0066

Appleyard, Donald

Lintell, Mark

(both) Univ. of California, Dept. of City Planning, Berkeley

Environmental quality of city streets: The residents' viewpoint.


The San Francisco Planning Department did a small study of the quality of the environment 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.

NP73-1D-26

72-STE-0045

Venhac, J.J.

Le Brilloin de l'Environnement. Édition Robert Laffont, Paris, France. 307 pages, 1971. (In French; no tabs; 23 tabs, 4 refs., from test & SS. WATER POLLUTANTS: AIR POLLUTANTS: NOISE CONTROL: WASTE MANAGEMENT: URBANIZATION: ECONOMICS: both. Noise pollution, air pollution, waste management, noise, mining, urban crowding, and water usage are discussed, as are ways to deal with these problems. The environment of industrial civilization is defined and subdivided into 3 parts for analysis, to discuss these problems and actions to be taken are discussed. The technology of civilization which causes pollution must help overcome pollution.

NP73-1D-27

72-STE-0171

Bhattacharya, B.

Indian Inst. of Technology, Kharagpur

An analysis of the problem of noise in the urban areas. See Citation No. 72-STE-0170 p. 26. [1972?]. Abs. only, from AA. NOISE SOURCES: NOISE CONTROL: INDIA: effects: urban areas: abstract only.

An analysis of the sources, effects and control methods of urban noise in India is presented.

NP73-1D-28

72-STE-0174

Ramanathan, N.L.

Ramanathan, N.L.

Relocating pollution in Ahmedabad. See Citation No. 72-STE-0170 p. 28. [1972?]. Abs. only, from AA. NOISE SOURCES: NOISE CONTROL: INDIA: Ahmedabad: traffic noise: abstract only.

Results of surveys of 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 "noise map" of the city is included.

NP73-1D-29

72-SGD-0793

Sturman, Gerald M.

Persons, Brinckerhoff, Quade & Douglas, Inc.

New York, NY

Effects of highways on urban environments. Journal of Environmental Systems. 2(1): 61-69, March 1972. Abs., 2 figs., 3 refs., from AA. HIGHWAYS: AUTOMOTIVE POLLUTANTS: NOISE GENERATION: Impacts on an urban highway on the communities through which it passes 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
Envision theories of aerodynamic noise generation are critically analyzed with special emphasis on conventional acoustics and gaseous dynamics with special reference to supersonic jet noise. In this review the basic work of Stoker, Kirchhoff and Rayleigh on the theory of waves in fluids is reviewed and developed to provide a firm basis for the critique. The advantages and disadvantages of acoustic analogy theories such as Lighthill's are thoroughly discussed in Section 11.3. A contribution is made towards removing the criticism noted by Lighthill's isotropic aerodynamic theory. New developments such as those by Crow, Liloy and Stack are emphasized. On the basis of the evidence provided by the critical review, a new unifying theory for jet noise has been developed. (GRA)
NP73-1E-004

A72-12953 ♦ The problem of aerodynamic buzznoise (Los problemas de aésecuencia cíclica). P. A. Léandré (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). In: International Congress on Acoustics, 7th, Budapest, Hungary, August 18-26, 1971, Proceedings. Volume 7. (A73-12951 03-12) Budapest, Akadémiai Kiadó, 1971, p. 1-10. 7 refs. In French. 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 modulation 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 antinoise legislation and regulation, recent studies, and future prospects.

F.R.L.

NP73-1E-005

A73-12972 ♦ Performance and noise generation studies of supersonic air ejectors. P. S. Barna (Old Dominion University, Norfolk, Va.)). In: International Congress on Acoustics, 7th, Budapest, Hungary, August 18-26, 1971, Proceedings. Volume 1. (A73-12951 03-12) Budapest, Akadémiai Kiadó, 1971, p. 481-484. Experimental study of the effects of primary and secondary air 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-006


NP73-1E-007


NP73-1E-008

A73-14043 ♦ Sources of noise in aerophysics. B. A. A. Marshall (Rolls-Royce, Ltd., Crewe, England). Academic Press, London. 1971. 272 p. A noise source broadband in both criticality and frequency is generated for low-bypass-ratio engines, such as the Rolls-Royce Spey, and for high-bypass-ratio engines, such as the Rolls-Royce RB.211. It is seen that the shortness from low to high bypass ratios results in a mental noise reduction by substitution of air turbine and broadband noise (characteristics of fan, compressor, and turbine) for the low-frequency noise of the jet. The generation mechanisms of jet, compressor, fan, and turbine noise are analyzed. A study of jet mixing noise reveals a new noise source, normal tailpipe noise, which is an internal source amenable to reduction both by design and with acoustic linings. It is shown that aircraft quality can be a significant factor for the single-engine ten second intake guide screech. Turbine noise investigation also requires careful superimposition to reveal the source.

V.P.

NP73-1E-010

A73-14059 ♦ The concorde as a threat to the environment. P. Lloyd. Aeromedical Journal, vol. 18, Oct. 1972, p. 569-583. 10 refs. 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 causing noise and odors, 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-011


NP73-1E-012

A73-17180 ♦ Olympicks na Konskodu (L'Olympia trest le Concours). J. Devries (SNECMA, Paris, France) and P. H. Young (Rolls-Royce, Ltd., Bristol Engine Div., Bristol, England). (Association Aéronautique et Astronautique de France and Royal Aeronautical Society, Journée Louis Blériot, 25th, Paris, France, Apr. 21, 1972.) L'Aéronautique et l'Astronautique, no. 37, 1972, p. 5-22. 8 refs. In French. 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 intensive research, with continuous improvements being introduced. The tone 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. (Author)
NP73-1E-014

A72-32621 


An investigation of externally blown flap impingement noise was conducted using a full-scale turbojet engine and aircraft wing. The noise produced with a duct nozzle installed on the engine exhaust system was greater than that produced by a conical nozzle at the same thrust. The duct nozzle caused the jet velocity to decay about 35 percent at the flap. The presence of the wing next to the conical nozzle increased the noise, as did increasing the flap deflection. Compared with the conical nozzle, the duct nozzle produced slightly lower noise at a flap deflection of 60 deg but produced more noise at the lower flap deflections tested. (Author)

NP73-1E-015

A72-32482


A detailed study of the transmission of acoustic waves 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 to infinity upstream and downstream velocity profiles inside a streamwise plane. 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. At subsonic velocities, the acoustic waves appearing in a polar plot of far field mean-square pressure approach the downstream axis as frequency decreases. (Author)

NP73-1E-016

A72-32916


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 spectra of the radiated sound power and the jet pressure is derived for an assumed form of the jet pressure cross correlation. The spatial variation of the overall jet pressure, the frequency spectra of the jet pressures, the jet and radial cross 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 pressure model with regard to noise suppression are also discussed. (Author)

NP73-1E-017

A72-38105


Experiential data of the peak acoustic decay in a moving medium are presented for several types of nozzles. The nozzles include a ducted emitter nozzle of a type considered for reduction of jet-flap interaction noise for externally blown flap STOL aircraft. The effect of compressibility on the near field velocity decay of a hypersonic nozzle is also discussed. Tentative correlation equations are suggested for the data measured. Recommendations for minimizing forward velocity effects on jet noise and jet-flap interaction noise are made. (Author)

NP73-1E-018


A study of jet noise is presented with the operation of five engines. A comparison is made between a comparison of the various jet engines and two small jet engines. The history of the engine is described against the background of events in the field in the past couple years, and the state of the art is presented. The experimental results are included, with a comparison of what we are and going on the present and the future. The paper discusses with a stepwise approach for a long term solution to the problem which requires cooperation for all parties involved. (Author)
The data of propulsion device are illustrated with statistical data collected by measurements near the approaches and on the runways of the Women-Grobb airport.

T.M.
NP73-1E-026

The report summarizes the results obtained at General Electric during the first phase of the Air Force Superpower 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 analytical model describing the flow mechanism in supersonic jets is presented and compared with experimental data. A large number of theoretical models describing supersonic flow jet noise are evaluated.

NP73-1E-027

The use of supersonic wind tunnels, acoustic properties, (Walls, aerodynamic noise), (Noise, Control), Frequency, Manometric frequency, Manometric model, Flow Fields, Mathematical analysis, Orifices.

The report presents the results of recent studies of noise in wind tunnels. Noise levels in the free stream and at the test section wall were measured in two tunnels as a function of Mach number, Reynolds number, wall angle, and wall porosity. In one tunnel free-stream noise characteristics were also evaluated with solid (taped) test section walls. Test results revealed that the perforated test section wall reduces discrete frequency, high energy noise. A critical Mach number range was noted.

NP73-1E-028

The noise survey was conducted at McClellan AFB, California to investigate the noise environment of maintenance personnel exposed to the F114, F106, and F110 A/C during test run-up operations. The report describes conditions which were seen to affect the noise environment in the open field.
NP73-1E-030

Interior noise transmitted by an airplane fuselage subjected to turbulent boundary layer excitation and evaluation of noise reduction techniques; W.V. Bhat (Boeing Co., Seattle, Washington), J. P. Nibler; 1 Sound Vibe v 18 n 6 Oct 22 1971 p 615-64; The acoustic power 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 power is approximately 60 and 70 dB relative to 10^-12 W at Mach 0.65 and 0.85 respectively. Damping gaps and rubber wedge absorbers, applied to the structure, reduce the acoustic radiation and they are more effective at Mach 0.65 than at Mach 0.85. The flight test data are in poor agreement with available wind tunnel measurements, indicating the need for improvements in scaling laws.

NP73-1E-031

Community noise levels of the DC-10 aircraft; A.J. McKee; Anglo-Am Aeronaut Conf, 12th, July 7-9 1972, Con Aircons and Spiro Inst, 1971, P. p 10-14, 7 p; Noise levels for the DC-10 are presented and community noise levels of the aircraft are discussed. 2000

NP73-1E-032

Turbofan trends for short haul; L.G. Dawson (Holker Engineering Ltd., Bury, England), T.D. Selle; ASME Pop 73-SST-03 for aeroengine design; 1972, 11 p; After a general introduction of the turbofan problem the relation between conventional and STOL options are briefly reviewed and their requirements as regards the power plant are discussed. Some of the associated isolated disadvantages are considered including variable pitch fans, complications, and the environment, (notes and photographs). 1992

NP73-1E-033

S 55643. Lovesey, F. J. (Eng. Phys. Dep., R. Aircraft Establ., Durnborough, Eng., UK.) Hovercraft: noise and vibration. J Sound Vib 20(2): 241-245, Illus. 1972. -- Hovercraft are a relatively new and unique form of transport, capable of traversing terrain which previously was 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.

Nekipelov, M.I. Irkutsk State Medical Inst, USSR


Abs., illus., refs. (Some in Ger.; Russ.), from AA.


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.

That sonic bang.

Stevens, James Hay

Environment This Month. Lancaster, Eng.


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

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.
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2. NOISE DETECTION AND MEASUREMENT
2. A GENERAL
A73-10936  


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)
Indicators of environmental noise.  


Sum., illus., numerous refs. from Text & AS.

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 Roy 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.

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Basics of noise.

See Citation No. 72-5TE-0148. 28 pages. 1972.

No abs., 11 figs., 8 refs., from Introd.

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. Those 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.
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 dBA, simultaneously measures time, and integrates the result. Exposure over 115 dBA 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] Linburg W.
Z Gesamte Hyg 18:318-21, May 72 (Ger)

[Improved noise meter] Knügge GP.
Gig Saalt 37:812, Feb 72 (Rus)
2B INSTRUMENTS
(See Also)
2C008  3D052  5C013  5C022
2. C TECHNIQUES
NP73-2C-001

NP73-2C-002

NP73-2C-003

NP73-2C-004

NP73-2C-005

NP73-2C-006

NP73-2C-007

NP73-2C-008

NP73-2C-009
NP73-2C-010

Experimental atmospheric absorption values from aircraft flyover noise signals: D.L. Bishop and M. E. Sechan, J. Acoust. Soc. Am., Vol. 61, No. 5 (1977), pp. 1243-1249. A detailed analysis of the noise recorded as the ground during a series of 30 aircraft flyovers by two aircraft (a four-engine turbojet transport and a four-engine piston transport) during a single day of field measurements has been completed. Noise levels recorded at five positions under and to the side of the flight path were acquired from the field notes. 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, N 0.907.

NP73-2C-011

A personal audio dosimeter was developed to monitor an individual's exposure to noise. The dosimeter is only 15 in³ 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 ear muff with miniature electronics to permit the wearer to hear low level signals while wearing the muff but protect him from levels in excess of 80 dBA is also described.


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2. D FACILITIES
Magnitudes estimated by each of 21 Marines were identical for a variety of visual patterns under three methods of aircraft presentation: head-up presentation in an aircraft simulator, head-down presentation in a normal non-instrument cockpit, and ophthalmoscopy presentation. Comparability of ratings obtained in those environments were evaluated with respect to variability of ratings from physical magnitude, reliability of ratings, and the scale value assigned to each rating method. Anomalous environment was found to have less effect upon physical magnitude relationship and ratings of perceived magnitude were less affected by the anomalous environment in which they were obtained. The need for further study of problems arising between judgment correlation of physical magnitude and the methods of magnitude estimation and physical magnitude is indicated by the finding that in these tests the Marines, though instructed otherwise, apparently judged the magnitude rather than the illusion magnitude of correctly shown patterns.
2D FACILITIES
(See Also)

2B002  5B001
3. NOISE ABATEMENT AND CONTROL
NP73-3A-001

EDUCATION IN AIR ROUTE TRAFFIC CONTROL CENTERS, REMOTE SERVICE STATIONS, AND TRAFFIC CONTROL TOWERS AND REMOTE FACILITIES Final Report
10 Nov. 1971 - 10 May 1972
J. M. Christie and R. G. Watson

Various methods of reducing noise in several FAA air traffic control and navigational facilities that present the acoustical limits of noise exposure are discussed. Noise control procedures for each facility under consideration are described as well as the methods for reducing specific noise reduction methods. Further study is recommended.

NP73-3A-002

NASA HEADQUARTERS

NP73-3A-003

ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C. OFFICE OF HUMAN ABERRATION AND CONTROL

MORE PROGRAMS OF PROFESSIONAL/INDUSTRIAL ORGANIZATIONS, UNIVERSITIES AND COLLEGES
31 Oct. 1971 85 p. level

Information pertaining to new programs being sponsored or carried out, either directly or indirectly, by professional, industrial, and voluntary associations (i.e., industrial) is presented. Information is also given on private industry research and educational and research programs. A bibliography of professional publications relating to noise is included.
Summary of the activities of an aircraft company with regard to
the reduction of jet aircraft noise for those major applications of
commercial aircraft. The jet noise problem is discussed first.
Activities with regard to the use of engines, systems, and noise in
combination with CD and propeller noise will be outlined. Com-
parisons of noise reduction and their costs are made and it is
shown how these data support the compatibility of jet BFE with the
community. The conventional aircraft jet noise problem is reviewed
in the light of current and proposed noise regulations. Recent test
experiments are reviewed and an estimate is made of the apparent jet
noise floor which can be economically achieved. This jet noise
problem for future STOL or short-takeoff aircraft is discussed and the
effective use of engine noise data in the low-noise limits of BFE
fuselage design is indicated. The evaluation of jet noise due to
local impingement on an FPO structure is noted. (Author)

NP73-3A-005

The variable pitch fan - Propulsion for quiet
STOL. D. G. M. Smith (Smith's, Ltd., Gloucester, England).
Institut de Mécanique de Fluide, International Symposium on Air
Breathing Engines, Rome, Monte Carlo, June 1930, 1972, Pams.
934 p. 40 refs.

Notice of design-and-development work on the concept of
variable pitch fan are presented in a number of paper on this theme. The
current status of the present types of fan are summarized in a
discussion of the limits feasibility of a fully variable pitch fan
drivered by an Axial fan aboard engine and the advantages of
variable speed design is shown in the applications of various
commercial and military engines. The efficient use of engine noise
data is given to the advantages and constraints with different blade
design of varying the pitch range. A compressor test rig with the
blade pitch selector and model tail section tests and an Axial fan aboard engine noise data used in
the tests. The advantages of the STOL propulsion design concept are
indicated. (Author)

NP73-3A-006

In the field of aircraft noise
Technology Progress report at the meeting of the Noise Reduction
Committee of the National Research Council of Canada. L. G.
Nesporv and G. G. Eldin (Engid, Leningrad, Russia, Italy) &
NP73-3A-007

NP73-3A-008

NP73-3A-009

NP73-3A-010
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 & Glueck. 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 brief history of Western Electric's mandatory hearing conservation and engineering noise abatement program is given. To augment the in-plant long-range efforts to reduce noise at its source, the Western Electric procurement specification for the purchase of new machinery is detailed. The mandatory hearing conservation program is outlined.

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 & Glueck. 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.

Noise control of chemical plants is examined, along with the in-plant long-range efforts to reduce noise at its source. The Western Electric procurement specification for the purchase of new machinery is detailed. The mandatory hearing conservation program is outlined.

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 & Glueck. 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.
Future of gasoline engines.


Abs. only, AA.


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. Industry must take the initiative to design for quiet without waiting for legislation and proof of large market. The motivation is preservation of the human environment. Some voluntary moves have already been made in the U.S. Manufacturers have voluntarily made silenced giant portable air compressors, a quieter garbage truck, a silenced metal garbage can, a silent calculating machine. Legislation will now be needed to protect these progressive manufacturers from their noisy but cheaper competition, to protect the public from misleading advertising, and to improve design goals. But the federal government is moving too slowly. Industry can choose to sit back and wait, or it can voluntarily expand displays of leadership mentioned above. To educate industry to its responsibility to man and his environment is a major goal of Citizens for a Quieter City. The ultimate noise abatement goal must be a partnership of government, citizen, and industry.
Noise and Vibration Control; Measuring, 1972-1975


4. 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].


6. 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] Läppho Ä
von.
Z Laryngol Rhinol Otol 51:215-20, Apr 72 (Eng. Abstr.)
"Gor"
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3.B METHODS
NP73-3B-001

NP73-28991 National Aeronautics and Space Administration, Langley Research Center, Hampton, Va.
A NOISE REDUCTION SYSTEM FOR REDUCING EXHAUST NOISE FROM THE VERTICAL TAIL PROPELLER OF A HELICOPTER

David W. Bergman
Langley Research Center
Hampton, Va.

A system is described for reducing the exhaust noise of a helicopter's tail propeller. The system involves the use of a series of baffles and other acoustic elements to divert the airflow and reduce the noise output. This approach is intended to improve the overall noise reduction efforts in helicopter applications.

NP73-3B-002

NP73-10929 National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
A NOISE REDUCTION SYSTEM FOR REDUCING EXHAUST NOISE FROM A TURBINE ENGINE

David W. Bergman
Lewis Research Center
Cleveland, Ohio

A system is described for reducing the exhaust noise of a turbine engine. The system involves the use of a series of baffles and other acoustic elements to divert the airflow and reduce the noise output. This approach is intended to improve the overall noise reduction efforts in turbine engine applications.

NP73-3B-003

NP73-20971 National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
A NOISE REDUCTION SYSTEM FOR REDUCING EXHAUST NOISE FROM A TURBINE ENGINE

David W. Bergman
Lewis Research Center
Cleveland, Ohio

A system is described for reducing the exhaust noise of a turbine engine. The system involves the use of a series of baffles and other acoustic elements to divert the airflow and reduce the noise output. This approach is intended to improve the overall noise reduction efforts in turbine engine applications.
NP73-3B-004


A number of optimization problems are solved and solved for supersonic aircraft flight subject to the condition that a shock wave appears only incipiently in the sonic boom wave on a given point. The principal result is one giving the minimum effective gross weight of an aircraft of given effective length under given flight conditions. The calculations of various solutions with inequality constraints is used, with the novel features of a non-local invarinat rotation and of only on upper bound on a control variable. (Author)

NP73-3B-005


Nisim (1972) proposed the use of microphones for exciting the boom' source as a means of controlling sonic boom using the fracture path of supersonic aircraft. The theory also that current flight across a local source of sonic boom and that, in each place, the platform of curvature than this, shock do not form. By applying a technique, which makes it possible to plot the source from directly, as measurements over applied to Nisim, it is found that regions of single, double, and more triple shock can exist, however, no shockless regions are observed. (F.R.L.)

NP73-3B-006


The results of a study conducted by Arnett (1971) indicated that a substantial attenuation of noise intensity can be realized 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 thermodynamics, and the vital distribution of sound sources and characteristic 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 reorientation of turbulence structure in the mixing region. (G.R.)

NP73-3B-007


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 excessive noise by lining a fraction of the duct's length with acoustically treated material, and by proper choice of R/D values for the 80-dB bandwidth upstream of the straight cylindrical ducts. (F.R.L.)

NP73-3B-008


An experimental study was made on the influence of a forward rectangular cavity, of an inclined plates, and of the airfoil section on the radiation of noise generated by an acoustic line fan. It is shown that efficiency will be saved and noise level lowered by inclining the rear. Noise level is most effectively lowered when the forward radiation angle is 15 deg. Inclusion of the stator is also effective, and the primary radiation noise has been decreased by 5 dB at 45 deg of the inclining angle. Efficiency can be improved and noise level reduced by suitable design other aircraft section, and by adoption of the design of the hie various types as a flow pattern. (F.R.L.)

NP73-3B-009


- The scope of investigations conducted with coaxial interacting subsonic jet flows covers (1) acoustical measurements in both the far boom field and near noise field, (2) surveys of mean flow properties and fluctuating pressures, optical visualization of 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 axisymmetric 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


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 quieter engines and improved operational techniques. It is pointed out that at present there are advanced technology engines capable of powering subsonic aircraft which could gradually replace the existing fleets of noisy jet aircraft. Such a reappraisal program would lead to a reduction of noise exposure areas by at least a factor of five. A further halving of exposure area could be accomplished with suitable development fixes directed at a further reduction of engine noise. (G.R.)

NP73-3B-011


Results are given of several analytical studies of noise suitable
for advanced subsonic commercial transport aircraft. This requires the reduction of reduced aircraft noise and improved overall noise levels on the basis of the individual nozzle components: inlet, fan, exhaust, etc. This is achieved by relating the noise and cruise speed parameters to which the aircraft system must be designed to specific limitations on the individual nozzle components. Performance requirements are then made (respectively for each nozzle component) of geometric design constraints. Overall nozzle designs, synthesized on the basis of the individual component studies, are briefly discussed. (Author)

**NP73-3B-012**

**A73-16129**


**NP73-3B-013**

**A73-98449**

The nozzle plume characteristics and the characteristics of the nozzle plume for precession of V/STOL special jets. The results of the on-site testing are compared to a demonstration of the full vehicle test data obtained by an extensive test program. The results obtained indicate that the inclusion of nozzles in the design is effective in meeting the requirements of the vehicle applications. Special attention is given to the consequences of nozzle shape and size on different blockage and flow conditions. A comparison of test results with the blockage test data and the results obtained for nozzle shape and size is given. The characteristics of the nozzle plume, nozzle design concept, and techniques for testing are also discussed. (Author)

**NP73-3B-014**

**A73-16168**


The extent to which reduction of jet noise can be achieved by surrounding a circular primary jet with an annular flow is examined. Acoustic experiments have been performed with a model hot primary jet which had a length number very close to one, surrounded by a secondary cold annular flow of variable velocity and area ratios of the coannular convergent nozzle. The experiments show that the reduction of high frequency noise emission depends on secondary flow velocity. In most cases, this reduction seems to be not compensated by an increase in low frequency noise power. (Author)

**NP73-3B-015**

**A73-15520**


Third-order analytical expressions are obtained for the lift and drag coefficients of a two-dimensional wing. The expressions are used to demonstrate the possibility of a boomless-flying configuration when the propulsive area of the powered area is reduced. The orientation is achieved by presenting the powered thrust axis in such a way that the powered area is smaller at the front than at the rear. Calculations by these expressions are shown to be in good agreement with actual results obtained from computer-aided analysis. It is also shown that three-dimensional configurations of this design give the maximum thermodynamic efficiency when a proportion smaller than 30% of the powered area is employed for the reduction of the powered area. Thermodynamic guidelines are given for poop plant design to be used for this purpose. (Author)

**NP73-3B-016**

**A73-16289**


This paper presents results of calculations of the vibration response of a supersonic fan to wind oscillations in the Boeing Vertol CH-47 forward rotor. The calculations are based on the use of the Boeing CH-47 forward rotor model and the Bell 412 main rotor model. The calculations
include logical reasons why noise is generated by these sources at the level most frequencies and (2) the effect of typical decorructing system design changes which may be useful for noise reduction at these frequencies. Comparison of predicted vibration amplitudes with measured values can be expected to yield both a qualitative understanding of the noise problem and also useful technical techniques which can be applied to other designs. (Author)

NP73-3B-021


Aerodynamics and the noise problem of current and recent aircraft are described or sponsored by NASA in the field of noise elimination technology. Figures of NASA 1961-1963 studies themselves to experimental quiet engines and quiet STOL aircraft programs are presented. The briefly reviewed program includes the 122 million General Electric of a 220 million contract to supply and test a series of experimental quiet engines for high-speed experimental quiet engines and quiet STOL aircraft programs are presented. The briefly reviewed program includes the 122 million General Electric of a 220 million contract to supply and test a series of experimental quiet engines for high-speed experimental quiet engines and quiet STOL aircraft programs are presented. The briefly reviewed program includes the 122 million General Electric of a 220 million contract to supply and test a series of experimental quiet engines for high-speed. (Author)

NP73-3B-022


The aim of this paper is to summarize the results of several years 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 those of hovercraft, and it is shown that comparatively small overall noise reductions of 4-8 dBA would make the internal noise comparable to that of short-haul jet aircraft. Structure-borne noise is shown to be the major source of noise at least in one current production craft. Low structural damping combined with lightweight and rigidly mounted machinery are found to be the major causes of structure-borne noise. (Author)

NP73-3B-023


The NASA, working with American Airlines, has conducted the first phase of research to evaluate the operational feasibility of two-passenger approaches for noise abatement. These two-passenger noise reduction was used to establish the upper glide slopes and on ILS. The work was used to establish the lower. The light fleet was modified to provide command information during the entire approach. Two-passenger pilots representing the airlines, professional pilot associations, FAA, and NASA participated. With an ILS approach for supersonic, the procedure gave a noise reduction of 18 dB at the cockpit and 8 dB at the nose (Author)

NP73-3B-024


According to noise control companies, the major sources of jet noise are associated with the landing gear which comes when the landing gear emerges from the wing. The major cause of noise is the mixing noise from the landing gear, which very large diameter permits the mixing flow and the noise to be transmitted with much higher speeds. Mixing noise still dominates the field of engines with supersonic exhaust speeds. However, the problem is that this is a quite different kind of problem, and noise suppression devices are needed in order to ensure that mixing noise is no longer a problem. (Author)

NP73-3B-025


Only engines are known to be used on various of NASA and reduced weight and noise (VTOL) systems of aircraft operation are to become a reality in the years ahead. Propulsion noise is responsible for the majority of the noise emitted. Some particular of the Radio-Rayns RD.211 engine, installed in the Lockheed Trillium, the quietest of all aircraft, are given. A usable feature of new engines is the use of two-dimensionally steerable fans which are able to produce suppress noise sources within the rotating fan. The noise of the jet is the same as jet noise. (Author)

NP73-3B-026


Analytic solution of the sonic boom problem for typical aircraft maneuvering in a polytropic atmosphere is obtained. By using the analytic methods of singularities and of characteristics, the sonic boom of a body traveling in a periodic arc is obtained. This polysynthetic Whitham formula for the lowest 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 environment in its own environment. The primary work in propulsion systems can be described as emulating the technology that strives toward making engines and the technology to design new propulsion systems for VTOL, STOL, and VTOL that operate at high speeds and that operate at high altitudes. (Author)
It is shown that focused beams that arise in sounding flight can be suppressed by the simple (although not always acceptable) expedient of directing down the aircraft. The correct decoherer will eliminate the local curvature of the wave front responsible for the focusing. Specifically, the tangential decoherer located along the normal to the wavefront is adjusted to cancel out the contrapled cooporation (dynamically related. The inertial terms of a prescribed limiting diaphragm 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 (obtain in a simple fashion to the tabulated width of the cable beam except for nonlinear flight, as a function of Euler 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
The effect of plants on microclimate and noise reduction in the urban environment. NORTHERN SCIENCE 7(1): 37-39. 1972. - 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 are capable of providing a small amount of attenuation for environmental noises that are either predominantly low or high frequency in composition. However, dense wide 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. ISA INSTRUMENT SOCIETY OF AMERICA TRANSACTIONS 10(4): 416-421. Illus. 1971. (Proc. 1970) - With the recent revision to the Walsh-Healey Act, possible high noise levels produced by control valves are a subject to concern by 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 culminates in 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.
Noise reduction by vegetation and ground.

Mounts to reduce tractor cab noise. A. E.

Improved earphone enclosure for communication in noise. Bauer BB, et al.

The control of noise produced by bar automatic reheaters.

Noise fades into the background when workers wear muffs. K. Gale. H Engineer
323:30 8 1971.
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 Standard on occupational noise exposure, is demonstrated as an example. Also a method for the choice and priority of controlling noise sources is reviewed. Examples of Noise Control Data Sheets formulated for engineering departmental use are presented.

High speed train noise control.
Abs. only, from AA.
Also in: Society of Automotive Engineers. New York. Section Papers No.

Rail mass transportation system planning and noise.
Abs. only, from AA.
Also in: Society of Automotive Engineers. New York. Section Papers No. 720664.

The role of the coal industry in environmental pollution is discussed, considering water and air pollution, thermal discharges, and noise. Successful means to control pollution are surveyed. Crystals of freeze concentrates can be applied in some cases to reduce water pollutants. Coal production in facilities with closed water systems forestalls water pollution of surface water by Fe salts. Air pollution can be decreased by condensation of noxious substances in exhaust gases. Thermal discharges are prevented through a closed cooling-water system with an air cooled condenser. Noises are reduced by adequate choice of compressor types, vibration free installation, and adequate acoustic insulation of machine chamber walls.

The known and specified noise characteristics can be used during the planning of transit systems to determine the expected wayside or community noise levels for various types of way structures, vehicles, and operational conditions, and can also be used to determine design features or system characteristics which should be included for the control of noise. This permits the inclusion of noise as one of the factors affecting system planning and design.
Several case histories of highway design and planning in Civil Engineering. New York, 42(9): Baltimore plans highways
Page, Anderson. Grant
NP73-3B-047

3B-045
Borbar, A.D. Holman Bros. Ltd., Eng
Recent developments in silencing pneumatic machinery.
See Citation No. 73-2TE-00049 pp. 167-170, 1971.
In English; no abs., illus., refs., from Text & SS.
MACHINERY: NOISE REDUCTION: INDUSTRIAL NOISES: pneumatic machinery.

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 canopy is lined with a thin combination of antistrumming 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.

NP73-3B-049

3B-045
Mugglin, Eth G.A. Zurich, Switz.
Laermbeaeinigung aus der Sicht des Bauunternehmers.
See Citation No. 73-2TE-00049 pp. 265-272, 1971.
In German; Eng., Fr. Ger. sums., illus., no refs., from AS & SS.
NOISE REDUCTION: CONSTRUCTION INDUSTRY: BUILDINGS: reduced-noise methods.

Ideally, a building method considers requirements of the building site and those of a neighbor, economics, and noise production. It is a question of developing building methods low in noise and of carrying them out with low-noise machines. Excessive building noise is only acceptable if no other absorbent planning is concerned with a lower-noise method would mean enormous extra costs. One example of a low-noise building method is the cavity wall method, which can be used instead of ramming iron bulkheads.

NP73-3B-050

3B-045
Reichow, H.B. Hamburg, FGR
Ein neuerartiger Baulicher Laermenschutz fuer die Stadt Kelsterbach am Rande des Flughafens Frankfurt A.M.
See Citation No. 73-2TE-00049 pp. 273-276, 1971.
In German; Eng., Fr. sums., illus., no refs., from AS & SS.

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 aimed 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.

NP73-3B-051

73-2TE-00138
Williams, J. E. Flowes
Imperial College, Dept. of Mathematics. London, Eng

Recent developments in silencing pneumatic machinery.
Aircraft noise in the 1980's.


No abs., 7 figs., 2 tables, no refs., from Text & SS.

AIRCRAFT: NOISE SOURCES: Future controls.

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 aircraft industry. New aircraft can be made quieter. They may be assessed by means of a 'noisiness foot-print,' so called because of the foot-shaped pattern of the ground area exposed to noise in excess of a specified level during take off and landing. Foot-print 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.


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. Units in 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. This information is 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. Overdimensioning 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

Warneke, Glenn E. (all) Lord Corp., Lord Manufacturing Co., Eri, PA

Structural damping as a technique for industrial noise control.


Abs., 1 figs., 3 tables, 15 refs. (2 in Ger.), from AA.

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.
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. 863,796. Int. Cl FO2k 1/26; U.S. Cl. 60-
226 R. 3 Claims.
PATENTS: NOISE DAMPING. JET ENGINES: assignor to Rohr Corp.,
Chula Vista, Calif.
3B METHODS
(See Also)

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3. C MATERIALS

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.

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.

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


NP73-3D-002


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, physiological, 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 appliance industry efforts; 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


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.M.

NP73-3D-004


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 average effects of chronic exposure to loud noise as well as psychophysiologically 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 regard to work-related noise standards, such as those specified by the Walsh-Healey Act. The basic standard specifies a distribution of noise intensities to which an individual might be exposed in a 24-hour period. The distribution may be approximated by the components of three Gaussian distributions with means and standard deviations of 130 and 3.150 and 8.5. Author: G.R.A. 

NP73-3D-005


The report presents results from surveys of the existing federal, state, and local laws, ordinances, and regulations governing the abatement and control of environmental noise. This basic assignment was divided into four subtasks: current governmental noise regulatory schemes: analyses of existing legal regulatory structure for noise abatement and control; the effectiveness of existing noise control regulations and proposals and problems in the regulation and abatement of noise. Author: G.R.A.
NP73-3D-007

ID-315 20-45
National Inst. for Occupational Safety and Health, Bethesda, Md.

CRITERIA FOR A RECOMMENDED STANDARD OCCUPATIONAL EXPOSURE TO NOISE

NIOSH-TR-72-77

Descriptors: (Occupational diseases, Noise (Sound)), (Noise (Sound), Standards), (Industrial hygiene, Noise (Sound)), Criteria, Noise reduction, Auditory perception, Exposure, Audiometry, Sound pressure.

Identifiers: *Noise pollution.

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.

NP73-3D-008

EIS-AA-72-022-7 7CS12.25/64P20.95
Federal Highway Administration, Washington, D.C.

NOISE STANDARDS AND PROCEDURES.

Final environmental impact statement.

Nov 72, EIS-AA-72-02-FLR-5882.
Supersedes report dated 30 May 72, EIS-AA-72-0199-D.


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 whether additional land to serve as buffer strips will 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.
NP73-3D-009


NP73-3D-010

† 51655. MEYER, ALVIN F. (Off. Noise Abatement Control, Environ. Pro. Agency, Washington, D.C. 20466, USA.) The need for standards on noise. J ACOUST SOC AM 51 (3 Part 1): 800-802. 1972.—The problem of noise is reviewed from the standpoint of environmental pollution. The regulation of noise by government at every level demands the setting up of standards which take into account not only scientific criteria but also economic, sociological and political considerations.
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 Sanita Pubbliche 52:693-4, Nov-Dec 71 (60)

NP73-3D-013

Noise exposure: the legal viewpoint. Fredrikson HM.
Trans Am Acad Ophthalmol Otolarngol 75:1272-82, Nov-Dec 71

NP73-3D-014

New industry anti-noise law requires hearing tests and sound controls. Ind Med Surg 81:24-5, May 72

NP73-3D-015

Mar '72

NP73-3D-016

Noise control and government regulation.
H. V. Semling, Jr. Foundry 100:53-5, F '72
Noise pollution.
Abs., illus., refs., from AA.
NOISE STANDARDS : URBAN NOISES : NOISE LEVELS :

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 Phq (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 Phq 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.

FLANAGAN, William

Noise limits demand improved engines and subsystems.
Sum. illus., no refs., SS.

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.

HEATH, W.M.

California's experience in vehicle noise enforcement.
Abs. only, from AA.

TRANSPORTATION NOISES : MOTOR VEHICLES : NOISE REDUCTION :

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 senior and district attorneys were consulted before initiating the enforcement program in different areas of the state. The 1st enforcement efforts resulted in a number of new vehicle models, both muscle cars and trucks, being recalled by manufacturers for refitting 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 recalled if particular levels were enforced.

LAMONICA, J.A.

Coal mine noise standard enforcement under the provisions of the Federal Coal Mine Health and Safety Act.
See Citation No. 73-ITE-00006 p. 141. [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 and Bureau of Mines enforcement personnel, requirements of the industry and the Bureau, and the treatment of violations.

MARRAZZO, R.M.

Environmental Protection Agency noise pollution program.
See Citation No. 73-ITE-00006 p. 170. [1972?].
Abs. only, from AA.

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 covered. 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.

VEDELIEFIE, R.

Legislation et reglementation sur le bruit.
See Citation No. 73-1GD-00017. 6 pages[1971?].
In French; no abs., no refs., from Text.

NOISE LEVELS : LEGISLATION : GOVERNMENT REGULATIONS :
FRANCE : urban : transportation : industrial noise.
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 vicinity 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.

BAIRD, Lawrence M.

Univ. of Southern California, Center for Urban Affairs, Los Angeles
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.
No abs., illus., numerous refs. from Text.

Grant: NOAA 2-35227.

WATER QUALITY : AIR RESOURCES : LAND DEVELOPMENT : SOLID
WASTES : NOISE REDUCTION : CALIFORNIA COAST : catalog:
government agencies and studies : Southern California.

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-024

73-ITE-00032
Mayo, Louis H.
George Washington Univ., School of Law, Wash., DC
Consideration of environmental noise effects in transportation planning
by governmental entities.
Society of Automotive Engineers. New York. Journal of Automotive
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-ITE-00035
Cooper, A.S.
California Highway Patrol
California laws and regulations relating to motor vehicle noise.
Society of Automotive Engineers. New York. Journal of Automotive
Abs. only. from AA.
Also in: Society of Automotive Engineers. New York. Section Papers No.
720655.
TRANSPORTATION : NOISE REDUCTION : STATE REGULATIONS :
LEGISLATION : CALIFORNIA : abstract only.
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 limits. California has pioneered interm 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.
An Environmental Conservation Element for the Los Angeles City
General Plan; a Collection of Environmental Conservation Studies.
Department of City Planning, Advance Planning Division, Los Angeles,
Abs. illus. refs. for various papers. from Text.
AIR POLLUTION : WATER QUALITY : NOISE REDUCTION : LAND
RESOURCES : SOLID WASTE DISPOSAL : PESTICIDES : CALIFORNIA :
Los Angeles City Planning Department.
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.
Noise pollution control in Illinois.
Noise Pollution Control in Illinois. Report. Illinois Environmental
Protection Agency, Division of Noise Pollution Control. Springfield.
10 pages. [April 1972?].
No abs., illus., no refs., SS.
NOISE REDUCTION : STATE REGULATIONS : LEGISLATION : ILLINOIS :
pamphlet.
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.
OCCUPATIONAL HEALTH : LEGISLATION : DUSTS : PESTICIDES : NOISE
STANDARDS : INDUSTRIES : US : abstract only : Occupational Safety
and Health Act : Rocky Mountain region.
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.
Die Wiethaup, Hans Dortmund, FGR


Abs. only, from AA.

Also in Society of Automotive Engineers, New York. Section Papers No. 720046.

TRANSIT 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 a 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. Definitive specification information for interior/exterior noise levels is 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.

The conquest of noise in Great Britain

British Noise Abatement 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.

Noise nuisance control by oil refineries.

See Citation No. 73-2TE-00049 pp. 171-173. 1971.

In English: Eng., Fr., Ger. sums., no refs., from AS & Text.


In 1963 oil companies operating in Western Europe established an international study group at The Hague to investigate the oil industry's environmental pollution problems. The progress of a section on noise control towards stated objectives is briefly reviewed. These objectives include collation of experience on neighborhood noise problems; information on legislation, standards, and codes; noise levels of particular types of equipment information on noise suppression measures; agreement on a standard method of assessing refinery noise levels, and development of a standard method of specifying noise levels for new equipment.

Municipal corporations: Noise pollution.


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 the 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
Patruszczek, S.A.: Univ. of Bath, School of Engineering, Eng
Criteria and standards.
See Citation No. 72-STE-0148. 14 pages. 1972.
96 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 usually 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-SGD-0548
Anon.
Noise control.
Sum. only, from Sum.
NOISE CONTROL: NOISE REDUCTION: INTERNATIONAL
COOPERATION; summary only OECD council report: traffic noise.
The Organization for Economic Cooperation and Development Council approved a report 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-SGD-0540
Anon.
Aircraft noise.
Sum. only, from Sum.
Also in: Sammelblatt 677, 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-SGD-0541
Anon.
Environment.

NP73-3D-040
72-SGD-0542
Anon.
Noise control.
Sum. only, from Sum.
GOVERNMENT PROGRAMS: POLLUTION CONTROL: SWITZERLAND: summary only: environmental protection council.
The Bundesrat decided to set up a council for the protection of the environment to be approved by referendum. The council would deal in particular with water pollution and conservation, clean air and noise control; it would also control and coordinate research and work in the whole field of environmental matters.

NP73-3D-041
72-SGD-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-SGD-0547
Anon.
Noise.
Sum. only, from Sum.
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-SGD-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
The harmful effects of noise on the environment are discussed, and sources of noise pollution and their elimination are considered. An outline for future legal research is suggested.

No noise abatement program.
NOISE CONTROL: LEGISLATION: LEGAL ACTIONS: municipal control.
Legal alternatives available to city attorneys to reduce noise pollution in cities are discussed. Municipal noise ordinances, limitations on municipal action and the enforcement of noise ordinances are considered. Court cases are presented.

EPA's noise abatement program.
No abs. 1 ref. SS.

Government programs and regulations concerning abatement of noise are discussed, with emphasis on the Clean Air Act of 1970. 31 U.S.C. 804 and a proposed noise control act. (S 1016).


duty

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 are discussed. Sources, regulatory affairs, and trends in the private sector, and at the local, state, and federal levels are investigated.

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 Otero County, Florida, are discussed, and the liability of airlines regarding noise control is examined.

No abs. 2 figs., data tables, 1 ref. from Text.
AIRCRAFT: EMISSION CONTROL: JET NOISE: NOISE REDUCTION: GOVERNMENT POLICIES: EPA.
Industry and government efforts to reduce aircraft and jet engine noise and emissions are discussed. Industry reduced jet noise by switching from "low bypass" to "high bypass" jet engines which move the air at a lower velocity through the jet exhaust, thereby creating less "whino." The Federal Aviation Association promulgated the 1965 Federal Air Regulation 38 which sets noise limits for commercial aircraft. The Environmental Protection Agency's standards and studies of aircraft emissions are discussed, and the industry's smoke retrofit program for jet engines is described.

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.

The evolution of laws and regulatory structures to control environmental noise are discussed. Sources, regulatory affairs, and trends in the private sector, and at the local, state, and federal levels are investigated.
Development of a federal traffic noise control law.

See Citation No. 72-6TE-0163 pp. 529-532, 1972.

No obs. 4 figs. data tabs. 3 refs. from introd.


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-0168
Murphy, John N. (all USBM, Pittsburgh Mining and Safety Sacks, H.K. Research Center, Industrial Hazards Durtin, J. and Communications Group, PA Summers, Charles R. Progress in noise abatement. See Citation No. 72-6TE-0168. 19 pages [1972?].

Abs. 7 figs., 4 tables. 3 refs., from AA. Mining Industry: Noise Absorption: Dosimeters: Noise-selective earmuffs.

The mandatory noise standards developed in response to the Coal Mine Health and Safety 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

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


Noise Control SST Norway Denmark Sweden: summary only.

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

NP73-3D-055

72-6GD-0679


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-0678

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-0757

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 playgrounds 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
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-0753
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 a 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 Introd. & SS

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
4.A GENERAL
NO CITATIONS THIS ISSUE

92
4.B STRUCTURAL
NP73-4B-001

ADVISORY GROUP ON AERODYNAMIC AND ACOUSTICAL PROBLEMS, PECHEM, Pica (Uruguay)

THE EFFECT OF DUCT DIESSEL AND DIESEL MIXTURES ON Emission of sound and other atmospheric pollutants, and the genetics, cause an unknown, true, and measured basis, which may result in atmospheric damage. This is followed by a section on the effects of club damage and a section on the damage history observed due to atmospheric damage. A summary of damage and its effects on sound and measured pollutants is included.

NP73-4B-002

FLYING V. U.S. Department of Defense, Aeronautics and Space Administration, Roland Space Flight Center, Huntsville, Ala.

AIRCRAFT OUTFLOW DESIGN CLAIMS RESULTING FROM ACOUSTIC ENVIRONMENT DEVELOPED DURING STATIC TEST Firing OF ROCKET ENGINES


During static testing of multi-million pound thrust rocket engines adjacent to the nozzle, this paper describes the noise levels generated by rocket engines. Structural damage claims and subjective complaints were filed by those who alleged that the noise levels were excessive. The statistical analysis of these claims and complaints which were filed during these rocket engine development programs led to the determination of the relationship between claims and overall sound pressure levels. Community exposure criteria required are those measured based on what can be considered allowable acoustic environments in large rocket engines.

NP73-4B-003

FLYING V. U.S. Department of Defense, Aeronautics and Space Administration, Roland Space Flight Center, Huntsville, Ala.

THE EFFECT OF DUCT DIESSEL AND DIESEL MIXTURES ON Emission of sound and other atmospheric pollutants, and the genetics, cause an unknown, true, and measured basis, which may result in atmospheric damage. This is followed by a section on the effects of club damage and a section on the damage history observed due to atmospheric damage. A summary of damage and its effects on sound and measured pollutants is included.

NP73-4B-004

NOTEBOOK 1

Studies of the power output on the noise level and their frequency distribution in the near field of a jet engine for short duration cycles by the author. The results show a reduction in noise levels due to the reduced cycle duration. This leads to a reduction in noise and an improved flight characteristics.

A procedure is described for determining the source of the noise in the area of interest/STODOL due to high noise levels in the near field of the jet engine. It is shown that Lightbourn's method for estimating the noise level in the far field can be extended to the near field by introducing a position-dependent velocity component. With this modified Lightbourn theory a numerical solution procedure is obtained which can be used to determine the near field and velocity component field of a jet engine.
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.

PYN, Francis

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.

Anonymous

Noise.
Sum. only. from Sum.
Also in: Times, 4, June 2, 1972.

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
4.C ENVIRONMENTAL
External acoustic environments, structural response, noise reductions, and the inferred acoustic environments 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 via 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.

Author
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

100
5. SOCIAL EFFECTS OF NOISE
5.A GENERAL
NOISE ABATEMENT AND CONTROL. VOLUME 1:
CONSTRUCTION NOISE
9 Jul. 1971 192 p. of Public Hearings before Office of
Noise Abatement and Control, Atlanta, 6-8 Jul. 1971
Avail. SOO $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.

NOISE: THE ULTIMATE INSULT
Hearings, 28-29 Jul. 1971
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 above. F.O.S.

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. FIGWER; J Acoust Soc Am 50 n 3 pt 1 Nov 1971 p 1223-8: A new set of noise criterion curves was 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.—I. 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

Social consequences of noise. H. L. Clark-... Inst Mech Eng Proc 198 no 9:11-107, 71

106
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 changeover to design and operation for quiet.


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)

1A004  1D011  1D029  3A020  3A025  3D006  3D049
1D002  1D023  1E027  3A021  3B039  3D010  3D056
1D009  1D025  1E033  3A024  3B040  3D047  4B008
5.B BEHAVIORAL
NP73-5B-001

RADIATION DETECTION CENTER, Malvern, Pa.

Effects of Prolonged Exposure to Sonar Signals at An Elevated Intensity. 2-
Twenty-Four Days Exposure to Signals at 98 db

British R. B. Wayburn and Emest M. Redden. 1 Oct. 1971

1 AID-741010, NSRDL-8911 April NTIS CSCI 08/18

Ten carefully screened male subjects, 5 erosion men from
the New London community and 5 Navy personnel were excluded
in the Audiology Spaces of the Submarine Medical Research
Laboratories. The total of 90 days, 3 pre-experimental (no boom),
20 days, exposure to the 98 db boom and 2 recovery days.

Adiishment daily, the test battery consisted of a sequential
reaction time task, a hand-eye coordination task, a measure of
muscular tension, and a measure of mood and affect. Although
n 5 of the 10 men some depressive trends occurred in the
first 3 days of the exposure period, the performance data
demonstrated no evidence of significance improvements. Similarly,
while 3 men reported mild re-occurring headache, and 5 indicated
the boom may have affected their sleep, as well as their performance
on certain testing procedures, the overall adjustment of the 0
men did not appear to be impaired allowing 1/2 - 3 days for
adaptation.

Author (ERA)

NP73-5B-002

NP73-5B-002 Control Inst. for the Deaf, St. Louis, Mo., Control Inst. for the Deaf

Effects of Noise on People

31 Dec 1971 105 p. relo

1 Contract EPA-56-01-05C00

1HDS-10041 April NTIS RC 01025

It is shown that noise can cause or increase of psychologi-able distress, either because of responses 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 of hearing loss, speech interference, nausea,
insomnia, etc.

G.B.

NP73-5B-003

NP73-5B-003 Civil Aeromedical Inst., Oklahoma City, Okla.

Residual Performance Effects of Simulated Sonic Booms Introduced During Sleep

W. Doucet and Georggin West. May 1972. 2 p. relo

1 FAA-AM-72.19 April NTIS HC $3.00

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
on 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
proved no evidence that exposure to simulated sonic booms
during sleep produced measurable consequences with respect to
cognitive performance. A significant age effect was found for
one of the ten measures. Significant differences (apparently a
learning effect) were found in performance across the three
phases (pre-boom, boom, and post-boom). This also a significant
interaction between age and phase for five of the
measures. Analysis of the simple effects showed there were
rather large 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-004 Naval Personnel Training Lab, San Diego, Calif.

NP73-5B-001

21 Dec 1971 204 p. relo

1 Contract EPA-56-01-05C00

1HDS-10041 April NTIS HC 57.75

The overall noise pollution problem which is associated with
outdoor noise in a community is considered. Problems are a
quantitative framework for understanding the nature of the
outdoor noise environment and the reaction of people and
community to an altered acoustic.

Author

NP73-5B-005


Social surveys were conducted in 24 areas with well-defined
noise exposure characteristics around eight airports in Scandinavian.
The results demonstrate that the extent of annoyance reactions in an
described exposure is closely correlated to the noise levels of single
overflights. For areas exposed to a low number of takeoffs, the
trend of "very annoyed" in the population is below 5% provided the
noise levels do not exceed 90 db(A). For areas exposed to a high
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 95 db(A) is linear (correlation
coefficient 0.99).

Author
Development of a noise annoyance sensitivity scale. NASA (NATL. AERONAUT SPACE ADMI) CONTRACT REP CR(194). 1-40. 1972.--Examining 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

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 EPI [Eysenck Personality Inventory] and the MMPI [Minnesota Multi-Phasic 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.

Otsenka naseleniem shuma zhelezodorozhno'go transporta (po dannym oprosa i slovesno-assotstativnogo eksperimen). GIG SANIT 37(2): 31-32. 1972. [Engl. summ.].--The paper deals with data on high noise levels created by railway traffic on territories surrounding its tracts. The noise causes great inconvenience to the population, 67% of whom presented mass complaints. The nuisance effect produced by the noise on the CNS manifested itself in the prolongation of the latent period in the reply reaction time during a verbal-association experiment.

NP73-5B-008

NP73-5B-007

NP73-5B-006
NP73-5B-009

A'BROOK, M. F. A brief examination of the psychological aspects of associations formed to promote the control of aircraft noise. Sound, 8(2), 1972, 37-38.

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

(Physiopathological problems raised by noise at an aeroplane construction factory) Chemin A, et al.

Bord Med 3:121-2 passim, Jan 70 (Eng. Abstr.) (Fre)
The effect of interruption rate on the annoyance of an intermittent noise.

Anderson, C.M.B. and Robinson, D.W.

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


Summary: 8 figs., 2 tables, 24 refs. from AS.

NOISE LEVELS: PSYCHOLOGICAL FACTORS: ENGLAND

Psychophysiological noise annoyance models: 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 dB(A), 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 intermittency 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.

LeVere, T.E. (both) North Carolina State Univ., Dept. of Psychology, Raleigh

Bartus, Raymond T.

Hart, F.E. North Carolina State Univ., Dept. of Mechanical and Aerospace Engineering, Raleigh

Electroencephalographic and behavioral effects of nocturnally occurring jet aircraft sounds.


Abstract: 5 figs., 2 tables, 11 refs. from AA.

Grant: NASA NGL 34-002-095.


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 stimuli 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.

Environmental pollution due to noise.

Desai, D.D. Bharatiya Vidyapeeth's Sardar Patel College of Engineering, Bombay, India

Environmental pollution due to noise.

See Citation No. 72-GTE-0170 p 26 [1972?].

Abstract: only, from AA.

NOISE LEVELS: ACOUSTICS: NOISE CONTROL: abstract only.

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.
BEHAVIORAL
(See Also)

1A002  1D005  1E034  3D004  5A003  5A012  5C077
1D004  1D007  3D002  3D017
5.C HEALTH AND PERFORMANCE
An initial study was made concerning the effect of cases beam disturbances on an individual’s discriminatory tracking performance for an unstable system. The tracking task simulated automobile driving. It was found that most windward noise disturbed and scattered in varying degrees. The preliminary results, though somewhat qualitative, show that visual data can be obtained from the type of simulation.

Author (GRA)

The off-vehicle noise was measured during a test where a 40% increase was observed. The study was to measure the ambient noise levels and temperature in a real environment. The data obtained from various noise levels were analyzed in a statistical model, by means of an analysis of variance. Results indicated that exposure level of noise was a significant factor in determining noise effects, while noise and the temperature noise interaction did not.

Author (GRA)

The paper investigates the effects of two environmental parameters, illumination and noise, on human performance. While many single-factor studies have been made on both illumination and noise, relatively little research has been done on
NP73-5C-007


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 times 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.V.E.

NP73-5C-008


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-009

A comprehensive damage-risk criterion (DRC) for impulse-noise exposure is needed, and it is desirable to state the DRC in terms of allowable TTS (temporary threshold shift) since TTS is both a valid and convenient measure of noise effects on hearing. This is possible only if TTS is also a reliable measure. Four TTS-reliability studies are reported. The following conclusions are reached:

1. Individual subject's TTS's are not sufficiently reliable to permit generalization of impulse-noise effects. Group mean TTS varies only slightly across a series of exposures and is considered to be a reliable (consistent, repeatable) measure. This is true for the exposure of normal-hearing subjects to different impulse-noise conditions, for the TTS's of subnormal-hearing subjects, and for frequencies representative of the whole range of human hearing. The formulation of an impulse-noise DRC should be based on group mean (mean, median, etc.) rather than on each or average group mean should be no larger than possible and should be representative of the population of which generalization of results is desired.

2. Reliability of TTS measurements of these aircraft communities on the average, 10 percent of the total number of aircraft noise hours in the greater Los Angeles area. One community beat Los Angeles International Airport by a factor of 2:1, while another community in the Los Angeles area 60 percent beat Los Angeles International Airport. The second community beat Los Angeles International Airport, but there was no significant difference between the two communities in the greater Los Angeles area. The second community beat Los Angeles International Airport by a factor of 2:1. The second community was similar to the airport in that they beat Los Angeles International Airport by a factor of 2:1. Both groups displayed average percentage differences no good and at certain frequencies slightly better than estimates obtained from the National Health Survey of 1:00-5:32. The overall findings did not make it possible to draw firm conclusions about community aircraft noise exposure or to assess the impact of differences in noise exposures between the two groups.

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 TTSs 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 immersion 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.


A long-term study of noise and hearing loss in the Du Pont Co. was started in 1966 to evaluate the Company's hearing conservation program. The study population consisted of about 30,000 men and women, of whom about 7000 worked in areas of high noise levels. Presents a preliminary, cross-sectional analysis of the data, with a longitudinal study to be forthcoming later. Loss of hearing acuity with age, at each test frequency, occurred at about the same rate in 2 levels of noise exposure and in quiet areas. Age-adjusted median thresholds were slightly greater among exposed workers at 3000, 4000, and 6000 Hz. Although some of the differences were statistically significant, primarily because of the large sample size, the magnitude of the differences was considered too small to be biologically important. Furthermore, the differences could be explained by factors other than noise. Tentatively concluded that the protection afforded by the Company's hearing conservation program was effectively preventing hearing loss among noise-exposed workers.—J. Abst.


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.—J. Shapiro
4465. Theckray, Richard I. (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(Apr). 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.

...may induce abnormality of cerebral circulation and various kinds of...
synchronism loudness showed the highest loudness. The influence of the 95 db had a exam ined. A "paired comparison" method was used. perceived hindering causing a considerable change of the auditory adaptation. balance disturbance, including vertical nystagmus, and have deep story function. This leads to the formation of a stable effect of external Level s of infrasound in moving vehicles can produce symptome of workers in normal quiet conditions (Q). On N nights the percentage of stages in the menstrual cycle, etc.) and initial protection will never establish ed. Many clmo which loss but not noise control at the source is the eventual solution. The nonauditory health effects of noise exposure were never established. Indeed, claims of general health effects are made, but no supporting evidence exists. In spite of the need for more research, enough is known to institute health conservation programs in industry.

The influence of the rise time on the loudness of outnd pulses was determined. For most of the range was used. The signals with the fastest onset was investigate d. The rise time was varied between 0.03 and 1.0 sec. For most of the measurements, a signal level of 95 db re 2 x 10^-5 m2 was used. The signals with the fastest onset showed the highest loudness. The influence of the rise time on the loudness was significantly dependent on the signal spectrum. The possibility of explaining the observed effects on the basis of charged synchronism of the neural activity and on the basis of a rigid adaptation in the nervous system is discussed.

The effects of continuous, high intensity, white noise on the CNS.--M. D. S. 57656. SCOTT, THOMAS D. (Nat. Sci. I., Univ. Calif., Santa Cruz, Calif. 95060, USA.) The effects of continuous, high intensity, white noise on the human sleep cycle. PSYCHOPHYSIOLOGY (BALTIMORE) 9(5): 227-232. Illus. 1972.--Eight male college students slept for 8 consecutive nights under conditions of 93 - 2 dB white noise (N) and under normal quiet conditions (Q). On N nights the percentage of total sleep time spent in REM [rapid eye movement] stage was decreased (p < .001), the percentages of stages 1 and 2 were increased (p < .05, p < .001, respectively) and REM latency was increased (p < .02) compared to Q nights prior to N nights. On Q nights following N nights the percentages of stage REM increased above baseline levels indicating compensatory recovery effects from REM sleep deprivation on the prior N nights. Stages 3 and 4 remained unchanged throughout the study. The reduction in stage REM on N nights was directly attributed to the effects of noise on the CNS and not a secondary result of an increased number of awakenings on N nights.

57728. KOZLOV, Y. N. and N. P. KISELEV. (Sarat. Res. Inst. Rural Hyg., Saratov, USSR.) Opti elektroencefalograficheskago obshchego znacheniya traktoristov v protsesse polzovaniya rabot. [Electroencephalog raphic investigation of tractor operators during field work.] GIG SANS 36(1): 106-107. Illus. 1971.--EEG data are given for 18 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. --Y. F. L.

In the presence of noise provides support for routine clinical measurement of discrimination in noise for these individuals. Individual performance in noise could not be predicted with a high degree of certainty from discrimination scores measured in quiet. --E. S.

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NP73-5C-038

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.

NP73-5C-039

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 human and rodents, hearing impairments, and the relationship between coronary ailments and mental disorders and noise are stressed. --S. G. B.

NP73-5C-040

O kombinirovannom deistvii faktorov vneshnei sredy na proizvodstve i ikh normirovani. [Joint action of environmental factors in industry and their standardization.] GIG SANIT 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 workshops 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.

NP73-5C-041

Effects of modulated noise on speech intelligibility of people with sensorineural hearing loss. ANN OTOL RHINOL LARYNGOL 87(4): 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


[Are hearing tests necessary during continued work in a noisy environment?] Schwartz F. Heussische Ohrenheilkd Laryngorhinol 108:304-92, 1972 (Eng. Abstr.) (Ger)


Threshold audiometric studies on hearing disorders in stationed ground personnel: Crossen D. Med Welt 33:818-20, 27 May 72 (Eng)

Temporary threshold shifts produced by pure tones and by noise in the absence of an acoustic reflex. J. H. Mills and D. J. 156:9-4 pt 2 17 '71


[Determinations of noise exposure during long extended acoustically oscillating noise—a methodical study from the viewpoint of work arrangement] Neubert J. Z Gerontologie 18:188-99, Mar 71 (Ger)


Effects of noise, tranquilizer and increased delay time of tracking performance and heart rate. Strasser H. Pfluegers Arch 332:Suppl 332:R12, 1972
Evaluating the extent and nature of their variability to learn about the risks of hearing loss to workers. The occupational noise exposure standard to an excess of 80 dB(A) may have variable effects on resultant temporary threshold shifts. Thirty subjects were exposed to noise bursts wherein the only variable was the level of duration interruption. The resultant temporary threshold shifts from these exposures are discussed.

Survey of chain saw operators: Nature of intermittent exposures and resultant temporary threshold shifts. Thirty subjects were exposed to noise bursts wherein the only variable was the level of duration interruption. The resultant temporary threshold shifts from these exposures are discussed.

Survey of chain saw operators: Nature of intermittent exposures and resultant temporary threshold shifts. Thirty subjects were exposed to noise bursts wherein the only variable was the level of duration interruption. The resultant temporary threshold shifts from these exposures are discussed.

Survey of hearing conservation programs in industry. See Citation No. 73-1TE-00006 p. 140. (1972?). Abs. only, from AA. INDUSTRIAL PROGRAMS: HEARING: NOISE STANDARDS: OCCUPATIONAL HEALTH: abstract only; hearing conservation: survey of industries. Excessive noise at the workplace poses risks 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 performance 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.
The biological effects of noise can best be considered into five categories: physical, psychological, physiological, pathological, and performance. Effects of noise on the ear and hearing, practical effects of noise-induced hearing loss, and a hearing conservation program are discussed.


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.
5C HEALTH AND PERFORMANCE
(See Also)

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