### XXIV-th OPEN SEMINAR ON ACOUSTICS

The XXIV-th Seminar on Acoustics was held at Władysławowo at Gdańsk, September 19-24. The seminar was sponsored by the Gdańsk Section of the Polish Acoustical Society in cooperation with the Committee on Acoustics of the Polish Academy of Sciences, the Institute of Telecommunication of Gdańsk Technical University and the Institute of Physics of Gdańsk University.

360 persons, participated in the seminar including from abroad. There were acousticians from Czechoslovakia, Denmark, France, GDR, Japan, Netherlands, Spain, Switzerland, USSR. Out of the 322 home participants nearly half were members of the Polish Acoustical Society.

There were 40 people from the Warsaw section, 38 from Wrocław, 29 from Gdańsk, 21 from the Upper Silesian section, 19 from Poznań, and 7 from the Rzeszów section.

A fortnight before the beginning of the Seminar participants were sent the following printed material: a detailed programme of the sessions, and a two-volume book entitled: "Prace XXIV Otwartego Seminarium z Akustyki — Proceedings of the XXIV-th Open Seminar on Acoustics" which included 163 four-page lectures submitted for the seminar. It should be noted that out of 172 papers, only those accepted by the reviewers were printed.

The evaluation of the papers was performed, as from the XIX-th Open Seminar on Acoustics, with the cooperation of the Section Boards of the Polish Acoustical Society, and the assistance of the Editorial Committee of the XXIV-th Open Seminar on Acoustics.

The timely sending of the lectures permitted the assumption that they were known to the participants concerned. Thus 10 or 15 minutes out of the 25 assigned for each lecture, were devoted to an introduction and to the presentation of complementary or illustrative material; the remaining 15 or 10 minutes were used for discussion. The breaks between lectures lasted 5 min. thus permitting sufficient time for moving between the different lecture halls.

The choice of lecture—hall was facilitated by an audio-visual monitoring system installed in all session rooms. Two remotely switched cameras and microphones in each room permitted the observation of the sessions from a centrally situated and easily accessible foyer with installed monitors, and also a simultaneous viewing of the sessions in the technical dispatch room.

The monitoring system of the sessions and the selective announcement system from the dispatch room to the loudspeakers in the individual rooms, hall, dining-room and corridors proved their effectiveness in ensuring the punctual realization of the programme without the need for frowning over-running sessions with music, as has been done at several previous Seminars. Furthermore, the awareness that in addition to the participants assembled in the room, other spectators were watching the lecturers and the participants in the discussion, stimulated the activities of the participants, and contributed to the high level of the debates and discussions.

A multi-channel earphone system was also installed for the synchronous translation of lectures into foreign languages and vice versa. Three cabins located in the technical dispatch room in front of the monitors permitted the interpretators to observe the lecturer,

thus facilitating a synchronous translation of the text. Plenary lectures were translated simultaneously into English, French and Russian. The translation of the session lectures was reduced to a minimum because of the lack of available funds.

The opening session was attended by representatives of the municipal authorities of Władysławowo and of the institutions engaged in the organization of the Seminar.

Occasional speeches were delivered. The Chairman of the Main Board of the Polish Acoustical Society prof. H. Ryffert opened the session. The audience paid homage to the memory of prof. Jerzy Wehr, an eminent Polish acoustician, who had lost his life on a expedition in the Hindukush mountains in the summer of this year.

During the Seminar 3 plenary lectures and 156 session lectures, including 143 published in the "Prace XXIV Otwartego Seminarium z Akustyki" and 10 amongst papers destined for poster session were orally presented. The lectures were divided into the following

subject groups:

Musical acoustics — Chairman L. Pimonov — 8 lectures,
Psychological acoustics — Chairman H. Ryffert — 5 lectures,
Speech acoustics — Chairman J. Kacprowski — 22 lectures,
Interior acoustics — Chairman W. Straszewicz — 11 lectures,
Electroacoustics — Chairman Z. Żyszkowski — 19 lectures,
Medical ultrasound diagnostics — Chairman J. Zieniuk — 7 lectures,
Ultrasonic techniques — Chairman J. Ranachowski — 14 lectures,
Ultrasonic transducers — Chairman W. Pajewski — 7 lectures,
Underwater acoustics — Chairman Z. Jagodziński — 14 lectures,
Molecular acoustics — Chairman A. Śliwiński — 22 lectures,
Noise sources — Chairman S. Czarnecki — 25 lectures,
Lectures not foreseen in the program — Chairman G. Budzyński — 2 lectures.
Poster session — Chairman L. Lipiński — 30 works.

The poster-session consisted of contributions related formally, but not in terms of subject-mater to the Seminar. As it has already been mentioned, ten of these contributions were included as lectures in the programme sessions while the others were the subject of free discussion.

The problem of environmental acoustics was discussed at a special plenary meeting

under the chairmanship of prof. S. Czarnecki.

Twenty two young authors submitted their papers for the Marek Kwiek competition. Twenty one of these presented their lectures, and were evaluated by the members of a jury set up by the Competition Committee. It should be noted that the competition took place according to the rules as altered last year.

Discussion sessions, summing up the results of the deliberations in a given group were held in each of the subject groups. The chairman of these groups presented the results of these sections at a final plenary meeting. These sessions, under the chairmanship of prof. I. Malecki, brought out many valuable remarks and observations for future use in the organization of the next Seminars. The advisability of organizing the recapitulatory sessions was stressed. It was found that the annual seminars organized by the Polish Acoustical Society have gained importance in fulfilling their functions as a review of the actual achievements of Polish acoustics, as a platform for the exchange of experience and views, as a school for the younger generation of acousticians and as an opportunity of establishing and strengthening links with acousticians from all over the world.

There was a general feeling that the use of the highly efficient equipment for the service and organization of the Seminar has saved much time for the participants for individual contacts and discussion, and informal group discussions. Coach excursions were organized during the conference. The location of the conference centre near the beach facili-

tated the establishment of direct contacts, especially with the many foreign participants. The importance of the party for lla participants at one table, on the evening of September 21 was stressed.

In brief, the proceedings of the XXIV Open Seminar on Acoustics included 199 scientific papers of which 159 were delivered as lectures. The proceedings are published in Polish with the summaries in English.

Every evening films on acoustics were shown, totalling 12 films: 5 French, 4 English, 2 American and 1 Polish. Full-length film and a short-feature film were also projected.

The Brüel & Kjaer exhibited their measuring instruments during the Seminar. The "3M" displayed audio and visual equipment. The publishing house "Ultrasonics" provided a comprehensive information about its publications.

The sponsors of the Seminar also displayed large-scale illustrations depicting the development of the Seminars organized by the Polish Acoustical Society and graphic proposals for the mark of this Society.

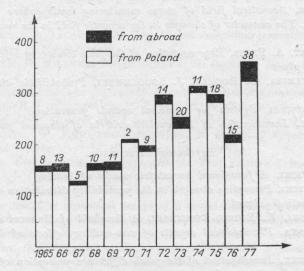


Fig. 1. Number of participants of the seminars organized by the Polish Acoustical Society and the Committee on Acoustics between 1965 and 1977

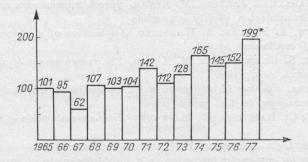


Fig. 2. Number of the papers presented at the seminars organized by the Polish Acoustical Society and the Committee on Acoustics between 1965 and 1977

# LIST OF PAPERS DELIVERED AT THE SEMINAR

# Plenary papers

- 1. G. Budzyński, Phonic problems of acoustics
- 2. A. Śliwiński, Problems of molecular acoustics
- 3. Z. JAGODZIŃSKI, Ultrasonic echolocation

## Section papers

## Musical acoustics

- 1. G. W. PAPANIKOLAOU, Microphone systems for tetraphonic recordings
- 2. E. LIEBER, Tune of pianos, causes and properties
- 3. J. Geisler, Acoustical field of stereo monitoring loudspeakers
- 4. J. REGENT, The character of changes in the acoustic field in the sound due to frequency correction
- 5. H. Ryffert, A. Preis, Representation of the flute timbre by reference to the timbre of selected organ pipes
- 6. R. W. Kulesza, B. Rogala, J. Sobolewski, Probabilistic structure of musical signals
  - 7. K. Muzalewski, System for transient sounds generation
  - 8. M. Meinel, Investigation of the quality criteria of classical guitar strings

# Psychological acoustics

- 1. S. HLIBOWICKI, A functional parametric model of hearing
- 2. S. Hlibowicki, Perceptive changes in the probability distribution of the instantaneous value of an acoustical signal
  - 3. J. Renowski, K. Rudno-Rudziński, A threshold of binaural sound image
- 4. M. Konarska, Physiological aspects of non-auditory effects of low-frequency ultrasound
- 5. J. Konieczny, Investigation of the pitch difference perception of selected sounds as a function of their duration and envelope shape

# Speech acoustics

- 1. S. Brachmański, J. Jarycki, M. Kozak, Speech transmission as a predictive measure of a speech transmission quality evaluation
- 2. E. TYBURCY, A. PAWLAK, Z. WOROBIEC, Application of a phonetic speech function to segmentation of continuous speech
- 3. J. Jarycki, S. Brachmański, M. Kozak, The measurement of skin vibration acceleration during speech production
- 4. Cz. Basztura, Speaker identification based on statistical distributions of time intervals between zero-crossings in the speech wave
- 5. A. PAWLAK, Cz. Basztura, W. Majewski, Time-normalization of utterances in speaker identification
- 6. W. Majewski, Cz. Basztura, H. Hollien, Analysis of zero-crossings in the speech wave as a technique for parameter extraction in a short-term model of speaker recognition
- 7. M. Gos, W. Myślecki, J. Zalewski, The dynamic control of a computer simulated series formant synthesizer in the synthesis of voiced phrases of Polish speech

- 8. W. Mikiel, P. Zarnecki, W. Tłuchowski, P. Maniecka-Aleksandrowicz, A. Szewczyk, Acoustic parameters of children's speech signal
- 9. R. Gubrynowicz, P. Zarnecki, An on-line minicomputer system for processing some parameters of the speech signal
- 10. W. Mikiel, R. Gubrinowicz, W. Hagmajer, Intonograf a system for the measurement and visualization of speech signal intensity and melody
- 11. J. Kacprowski, A simulation model of the vocal tract including the effect of nasalization
- 12. J. Zalewski, J. Jurkiewicz, H. Hollien, An application of the Itakura measure for the estimation of predictive coded pattern similarity
- 13. Cz. Basztura, J. Jarycki, Zb. Worobiec, Application of multiple regression analysis for quality classification of larynx transducers
- 14. J. Jurkiewicz, J. Zalewski, W. Myślecki, A formant contour analysis of Polish speech short phrases by means of the linear prediction method
- 15. E. Tyburcy, J. Zalewski, The distinctive features of vowel junctures described by a phonetic speech function
  - 16. G. Kielczewski, Digital synthesis of speech
- 17. W. Myślecki, J. Zalewski, A. Gos, Glottal excitation generation rules for the synthesis of short phrases of Polish speech
- 18. R. MILLNER, M. MILLNER, R. GROSSMANN, H. J. HEIN, Evaluation of the US-TM-glottogram
  - 19. O. MATUSZKINA, Fundamental frequency variations in voiced consonants of spoken Polish
- 20. W. Mikiel, R. Gubrynowicz, P. Zarnecki, W. Tłuchowski, A. Komorowska, A. Szewczyk, Evaluation of vocal chord paralysis by the analysis of the  $F_0(t)$  function
- 21. B. Adamczyk, W. Kuniszyk-Jóźkowiak, E. Smółka, Synchronization of speaking with echo and reverberation in the therapy of stuttering
  - 22. T. van der Graaf, Vowel analysis with the Fast Fourier Transform

#### Building acoustics

- 1. E. G. Tzekakis, The acoustical design of a sound-recording studio in Athens, Greece
- 2. E. Bromberg, J. Zalewski, An approach to some applications of digital analysis technique for characterising properties of "the speaker-listener" acoustic path in auditoria
  - 3. M. Tajchert, Directivity in the digital geometrical method of acoustical field analysis
- 4. St. Czarnecki, An effect of diffraction phenomena on the acoustic conditions in concert and industrial halls
- 5. M. Vogt, How to maximize the cancelling effect of an acoustic resonator acting as an insulating element
  - 6. S. Weyna, Model tests of noise transmission in the accommodation of sea-going ships
  - 7. B. Makarewicz, Intensity of waves in media with screening obstacles
- 8. B. Piwakowski, L. Dunkelmann, A vertical/horizontal tapping machine with adjustable tapping frequency
  - 9. A. Kulowski, A. Witkowski, Acoustical correction of a vaulted room
- 10. H. RYFFERT, E. OZIMEK, Perceptibility of changes of the spectral structure of sound propagating in a room
- 11. E. Ozimek, An analysis of the amplitude deformation of sound propagating in enclosure.

#### Electroacoustics

- 1. A. GABOR, J. ZARZYCKI, The minimization of loudspeaker system nonlinear distortion by proper bandwidth division
- 2. S. Hlibowicki, J. Renowski, K. Rudno-Rudziński, An enlarged equivalent electrical circuit of a loudspeaker

- 3. A. Puch, R. Wyrzykowski, The effect of rotor and stator port shape on the acoustic parameters of a dynamical generator
- 4. J. Zarzycki, A. Gabor, The optimization of the multidimensional functions describing nonlinear distortion
- 5. K. Musialik, W. Majewski, W. Myślecki, The rules for the generation of a limited set of messages by means of the three channel computer voice response system (CVRS)
  - 6. K. Somla, Fast Fourier Transformation and tracking filter capability
- 7. Z. Soltys, Z. Wąsowicz, Measurement of loudspeaker responses by means of non-coherent signals
  - 8. C. Szmal, Loudspeaker quality factor correlated with subjective evaluation
- 9. A. Dobrucki, The influence of the constructional properties of a conical loudspeaker membrane on its vibration and radiation
- 10. S. Nuckowski, B. Rogala, R. Zmonarski, Some problems in the optimization of the spectral method of nonlinear distortion measurements in the electroacoustical part of radio receivers
- 11. M. Glabisz, B. W. Kulesza, R. Szkop, Investigations of the electroacoustical properties of radio receivers using impulse methods
- 12. T. Zamorski, R. Wyrzykowski, The radiation of an acoustic horn below the cutoff frequency
  - 13. B. Bogusz, Applications of spectral analysis in infrasound measurements
  - 14. J. Kamiński, J. Jurkiewicz, Investigation of cooperation signals in kinematic pairs
- 15. S. Nuckowski, J. Szymbor, A nonlinear network with memory for measuring technique optimization
- 16. A. Defevre, J. Pouliquen, M. Chastagner, Measurement of the propagation velocity of acoustic waves
- 17. M. Rabiega, B. Rudno-Rudzińska, J. Zalewski, An application of digital techniques to the analysis of the signal obtained in the measurements of the reflection coefficient using a tone-burst method
- 18. R. Dyba, B. Zółtogorski, On the application of the Peltier effect in metal-semiconductor junctions to the generation of sound waves
- 19. A. Kulik, J. Ryll-Nardzewski, Determination of elastic constants in circular discs

### Ultrasonic medical diagnostics

- 1. M. Petzold, H. Pein, Koordinatendarstellung für mechanische Scanner ohne Funktionspotentiometer
- 2. A. Grospic, Q. Vo, I. Prerowski, J. Fabian, A. Belan, L. Hejhal, Noninvasive ultrasonic examination of aortacoronary bypass
  - 3. J. Etienne, Spectral analysis of ultrasound doppler signals in obstetrics
- 4. P. KWIEK, Application of double exposure hologram interferometry to the investigation of ultrasonic field distributions in the liquids
- 5. P. Kwiek, Theoretical background of time averaged hologram interferometry applied to ultrasonic field observation
- 6. A. Markiewicz, Transients in ultrasonic probes used in medical diagnostic equipment
  - 7. T. MARUK, Electronic focusing of the ultrasonic beam in medical diagnostic systems

# Ultrasonic techniques

- 1. W. Kołtoński, P. Jaroszewski, Geoacoustic apparatus petroscope PS-20
- 2. W. Koltoński, B. Zienkiewicz, Sonic detection and localization of cracks in bore hole casings

3. H. Gajda, The attempt at applying pulsed ultrasonic method for testing the elastic properties of the stalks of cereal plants

4. M. KOWALEWSKI, S. WACHOWICZ, Ultrasonic disintegration of ceramic materials

- 5. Z. Siwkiewicz, Ultrasonic vibration in powder element pressing
- 6. L. Lipiński, The change of hardness of ultrasonically excited polycrystalline Al samples
- 7. R. Kukulski, B. Niemczewski, Ultrasonic cleaner with liquid degassification

8. B. Kurella, Ultrasonic joining of metal inserts and plastic

- 9. A. GACA, Application of ultrasonic vibration to the plastic working process of metals
- 10. Z. PAWŁOWSKI, A. PILARSKI, Longitudinal ultrasonic wave techniques for measuring bond strength in adhesive bonded joints

11. J. MAZUREK, Z. PAWŁOWSKI, Research in inhomogeneous media using the spec-

tral analysis of acoustic emission

- 12. R. Suwalski, Sound power levels of airborne noise emitted by ultrasonic cleaners UM-4 and ATH-1117/TW
  - 13. A. SKRZYNECKI, Some problems of ultrasonic wire cleaning system construction

14. Z. KACZKOWSKI, S. RÓŻAŃSKI, Ultrasonic device for fatigue tests

# Ultrasound transducers

- 1. Z. Kaczkowski, E. Milewska, The piezomagnetic flexibility of Alfer transducers
- 2. Z. Kaczkowski, The impedance of Alfer transducers working with acoustic waves
- 3. E. Talarczyk, Ultrasonic aerolocation transducer with a vibration plate used in flexural modes

4. Z. Kleszczewski, A. Mleczko, The study of acoustic field distribution of piezoelec-

tric transducers using the Bragg diffraction method

5. I. Wojciechowski, The application of hologram interferometry to ultrasonic transducer investigation

6. W. NASALSKI, Synthetic aperture as a method for increasing the lateral resolution in ultrasonic visualization

# Underwater Acoustics

- 1. T. Otani, Y. Urabe, Effet non linéaire à la surface limite entre l'eau et l'air
- 2. J. C. Somer, Real-time improvement of both lateral and range resolution by optical signal processing

3. E. Wasiltsow, Metody rasčeta antennych reszetok

- 4. J. Tabin, Diffraction of an ultrasonic wave by an elongated target
- 5. C. Ranz Guerra, R. Carbo Fite, Echo formation by dioptric systems with high acoustic impedance mismatch
- 6. L. KILIAN, On some problems of sonar echo normalization and dynamic range compression
  - 7. H. LASOTA, On a method of target echo extraction from reverberation background
- 8. A. Stepnowski, M. Lamboeuf, J. C. Brethes, The application of the echo integration technique to the acoustic estimation of trumpet fish stock off the Atlantic coast of Marocco
  - 9. E. T. KOZACZKA, J. MORAWIEC, Investigation of piezoelectric hydrophones
- 10. B. Kibort, The errors in measurements on an underwater transducer in a closed acoustic system

11. W. MARTIN, Hydroacoustic system for position fixing of freerunning ship models 12. Z. Klusek, Influence of seasonal changes of the speed of sound profile in the Baltic on some properties of ambient sea noise

13. M. Brzozowska, Statistical properties of acoustic signals in the sea scattered by its

rough surface

14. R. SALAMON, R. GUDELEWICZ, E. NIEDZIAŁKOWSKA, Digital depth meter.

### Molecular acoustics

1. D. Sette, Acoustic emission in liquid crystals

- 2. W. F. Kunigelis, Akustoelektričeskije wzaimodiejstwie pri naličii dwoch tipow nositelej toka i koniečnom wremieni ich žizni
- 3. M. Blukis, C. J. Lewa, S. Łętowski, M. Roeding, A. Śliwiński, Piezoelectric properties of some polymers

4. F. M. MAZZOLAI, R. FRANCO, Effect of oxygen impurities on the diffusion coefficient of hydrogen in niobium

- 5. W. Szachnowski, B. Wiślicki, Acoustical study of association phenomena in hydrocarbon fractions of petroleum
  - 6. L. Werblan, L. Skubiszak, Ultrasonic absorption in polar-butyrolactone-water mixtures
- 7. E. Drescher, Length of selective attenuated waves due to structural changes in early stages of the hardening process
- 8. Z. Tylczyński, Determination of domain wall thickness in TGS crystals from measurements of longitudinal ultrasonic wave propagation
- 9. A. Drzymala, H. Herba, M. Cieślak, Ultrasonic investigation of the temperature dependence of the viscosity coefficient in cholesteric liquid crystals
- 10. M. CIEŚLAK, A. DRZYMAŁA, An attempt to estimate the relaxation time in cholesteryl mirystyate on the basis of the attenuation of dispersion of ultrasonic waves
- 11. A. Juszkiewicz, Z. Bartynowska, Second ultrasonic relaxation region in acetic acid esters
  - 12. W. Nozdriev, Investigation of carbohydrate solutions by an optical ultrasonic method

13. M. Szustakowski, Acoustooptic interaction development and applications

- 14. M. Łabowski, O. I. Zinowjew, Fine structure of the Rayleigh line of light scattering in critical mixture
- 15. M. Łabowski, A. Artykow, Study of the acoustical properties of some liquids over a wide range of frequencies

16. P. Sladky, P. Lokaj, Laser induced acoustic waves in some liquids

- 17. D. CIPLYS, A. DOMARKAS, Generacja akusticzeskogo szumowego potoka w n-InSb w otsutstvije magnitnogo pola
- 18. M. Nowicki, E. Niechoda, W. Woliński, G. Gackowska, Acoustooptic Q-switches for Nd: YAG lasers
- 19. H. SWÓŁ, J. MAŁECKI, Measurements of the Young modulus of natural crystal of gypsum by resonance method
- 20. J. LEWANDOWSKI, The acoustical field angular distribution of a wave scattered in a random inhomogeneous medium
  - 21. E. Soczkiewicz, Propagation of ultrasonic waves and the hole theory of liquids

22. B. NIEMCZEWSKI, The cavitation intensity of liquids

# Sound-proof and vibration-proof protection

- 1. J. Stenička, Prediction of structure-borne noise transmission from machines to constructions
- 2. W. Rybarczyk, Methods of establishing optimum set of technical solutions for reducing noise in working room

- 3. M. FRĄCZYK, L. KAŁMUCKI, J. REGENT, Designation method of noise source location in industrial spaces
- 4. W. Rybarczyk, Cost analysis and effects of noise abatement in different production rooms
  - 5. L. Rutkowski, Evaluation of short-time changes of acoustic diagnostic signals
- 6. M. MIROWSKA, Investigations of the propagation parameters of acoustical waves in sound absorbing fibrous materials
- 7. J. Degórski, H. Kaczmarek, W. Łańczak, Transverse vibration test stand foundation for marine diesel engines
- 8. J. Kozłowski, K. Somla, A. Sowiak, Real-time measurement and analysis of a ship-hull vibration
  - 9. T. Deloff, The selectivity of chamber mufflers
- 10. B. Rudno-Rudzińska, M. Rabiega, J. Zalewski, A mathematical model of road traffic noise
- 11. A. Podsedkowski, Methods of reducing the efficiency of siren noise radiation in axial fans
- 12. M. Slomski, The application of the relative acoustic pressure level to the determination of the sound field distribution of a non-stationary acoustic source
- 13. J. KAŹMIERCZAK, The vector representation of the noise spectrum in constructional research on machines using acoustic methods.
- 14. Z. Dukiewicz, W. Ziółkowski, Determination of space correlation function of structure-borne sound propagation in the beam-plate system
- 15. Z. Stepaniak, C. Cempel, Spectral and correlation analysis in ball bearing diagnostics
- 16. C. Cempel, M. Golec, Vibroacoustical processes similarity measures and their application in the diagnostics of machinery
- 17. W. Bandera, An experimental method of complex propagation constant determination in viscoelastic materials
  - 18. W. BARTELMUS, Coherence method of diagnosing machines
- 19. H. Chmieliński, D. Nitecki, Analysis of acoustical signal of drifter drills for acoustical diagnosis
- 20. H. Chmieliński, J. Motylewski, Measuring method and stand for acoustical diagnosis of drifter drills
- 21. H. Kusek, W. Birecki, W. Jankowski, The perception of acoustic signals against the background of factory noise
- 2. A. JAROCH, H. IDCZAK, J. RENOWSKI, Influence of rotating diffuser parameters on the diffusion of the sound field
- 23. J. JAKUBCZAK, M. MIELCAREK, W. TYRCHAN, The influence of the silencing of the inlet pipe installation of piston compressors on the sound level in the neighbourhood of the compressor hall

In the conclusion of this report it is instructive to include some data about the development of the Polish Acoustical Society which was provided on the information stand during the XXIV Open Seminar on Acoustics (See Fig.).