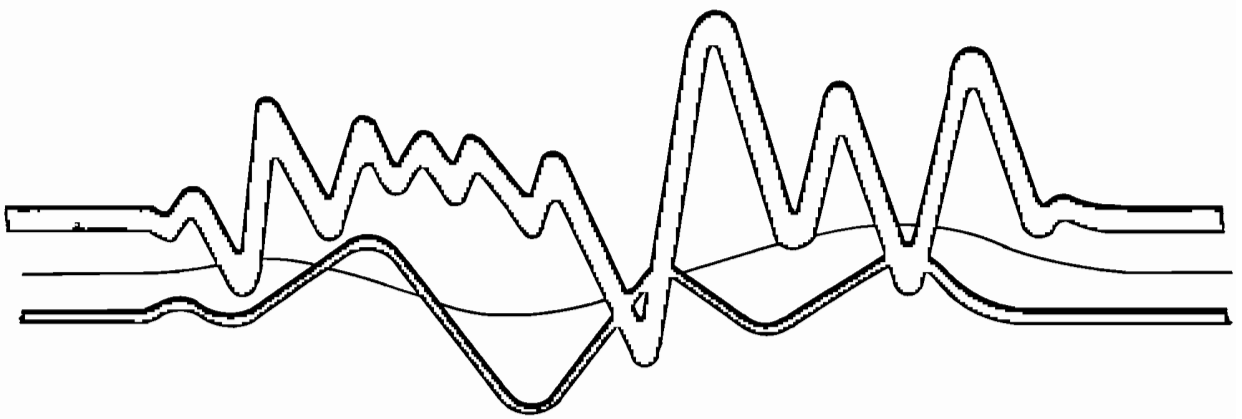
The Bulletin

OF THE AUSTRALIAN ACOUSTICAL SOCIETY

Volume 8, Number 3, December 1980



COUNCIL OF THE SOCIETY

Registrar

G.E. Harding

Standing Committee on Membership

P. Dubout, (Chairman)

Bulletin Editorial Committee

DIVISIONAL COMMITTEES

New South Wales

South Australia

Victoria

Western Australia

Addresses for Correspondence

Correspondence to the Society on National matters should be addressed to:

The General Secretary, Australian Acoustical Society, Science Centre, 35 Clarence Street, Sydney, N.S.W., 2000.

Correspondence to the Society on regional matters should be addressed to the appropriate Division Secretary as set out below:

N.S.W. Division (includes Queensland & A.C.T.): Mr. G. Patterson, C/ Science Centre, 35-43 Clarence Street, Sydney, 2000.
S.A. Division (includes N.T.): Mr. R.W. Boyce, P.O. Box 122, Rundle St., Adelaide 5000
Vic. Division (includes Tasmania): Mr. W.J. Kirkhope, P.O. Box 130, Kew, 3101.
W.A. Division: Dr. V. Alder, 10 Parkway, Nedlands, 6009

Address for Correspondence to The Bulletin

Mr. R.J. Law, c/o 240 Victoria Parade, East Melbourne, Victoria, 3002.

The Bulletin is available to non-members for an annual subscription of $15.00 (Australian). Address orders to the Editor. Advertising information may be obtained from Mr. J. Lambert (03) 651 4312

THE BULLETIN OF THE AUSTRALIAN ACOUSTICAL SOCIETY

Volume 8, Number 3, December 1980

CONTENTS

- The Bulletin is published by the Australian Acoustical Society, 35-43 Clarence St., Sydney, NSW, 2000.

SUSTAINING MEMBERS

SUSTAINING MEMBERS OF THE AUSTRALIAN ACOUSTICAL SOCIETY

The Society values greatly the support given by the Sustaining Members listed below and invites enquiries regarding Sustaining Membership from other individuals or corporations who are interested in the welfare of the Society. Any person or corporation contributing $200.00 or more annually may be elected a Sustaining Member of the Society. Enquiries regarding membership may be made to The Secretary, Australian Acoustical Society, Science House, 35-43 Clarence Street, Sydney, N.S.W., 2000.

ACI FIBREGLASS PTY. LTD.
P.O. BOX 57, ST. PETERS, NSW, 2044

AUSTRALIAN GENERAL ELECTRIC LTD.
86-90 BAY ST., ULTIMO, NSW, 2027

AUSTRALIAN GYPSUM LTD.,
P.O. BOX 106, PARRAMATTA, NSW, 2150

B.P. REFINERY (KWINANA) PTY. LTD.,
MASON ROAD, KWINANA, WA, 6167

BESTOBELL ENGINEERING PRODUCTS,
55 FALCOLN STREET, CROWS NEST, NSW, 2065

BRADFORD INSULATION INDUSTRIES PTY. LTD.
74-76 BURWOOD ROAD, BURWOOD, NSW, 2134

BRUEL & KJAER AUSTRALIA PTY. LTD.
33 MAJORS BAY ROAD, CONCORD, NSW, 2137

CRA SERVICES LTD.,
95 COLLINS ST., MELBOURNE, VIC., 3000

C.S.R. LIMITED,
BUILDING MATERIALS DIVISION, GPO BOX 483, SYDNEY, NSW, 2001

CEMAC INTERIORS,
A DIVISION OF CEMAC INDUSTRIES PTY. LTD., 9 GERTRUDE STREET, FITZROY, VIC., 3065

G.P. EMBLETON & CO. PTY. LTD.,
23 NANCARROW AVENUE, RYDE, NSW, 2112

HARDBOARDS (AUST.) LTD.,
P.O. BOX 467, NORTH SYDNEY, NSW, 2060

JAMES HARDIE INDUSTRIES LTD.,
G.P.O. BOX 3935, SYDNEY, NSW, 2001

JOHN LYSAGHT (AUST.) LTD.,
P.O. BOX 77, PORT KEMBLA, NSW, 2505

NYLEX CORPORATION LIMITED,
NEPEAN HIGHWAY, MENTONE, VIC., 3194

PEACE ENGINEERING PTY. LTD.,
8 FITZPATRICK STREET, REVESBY, NSW 2212

PICTON HOPKINS AUSTRALIA PTY. LTD.
138 BELL ST., PRESTON, VIC., 3072

QANTAS AIRWAYS,
70 HUNTER STREET, SYDNEY, NSW, 2000

RANK INDUSTRIES AUSTRALIA PTY. LTD.
P.O. BOX 632, CHATSWOOD, NSW, 2067

SOUNDGUARD PTY. LTD.,
34 PUNCH STREET, ARTARMON, NSW, 2064

THE CHADWICK GROUP,
301/25-27 MYRTLE ST., CROWS NEST, NSW, 2065

WARBURTON FRANKI PTY. LTD.,
199 PARRAMATTA ROAD, AUBURN, NSW, 2144

FROM THE PRESIDENT

Some months have passed since the Tenth International Congress on Acoustics concluded. It is opportune to recall this very successful event, and to officially record the appreciation of the Society of the very significant contributions by members.

I wish to offer thanks to all those members of the Society who gave an enormous amount of their valuable time and energy to achieve the goals set for the Congress. On behalf of the society, I affirm that we are deeply grateful for the marvellous co-operative effort which resulted in such a high level of success.

In particular our thanks go to Jack Rose as Chairman of the Executive Committee, Leigh Kenna, Secretary, Cliff Winters, Treasurer, Bill Hunter, Program Co-ordinator, Anita Lawrence, Technical Program, Athol Day, Social Program, Tony Hewitt, Exhibition, David Eden, Technical Visits, Richard Heggie, Publicity, Marion Burgess, Liaison with Associated Conferences, Denis Pickwell, Accommodation, John Dunlop, Facilities, Val Bray, Assistant Treasurer and G. Donald, Assistant Secretary.

Despite some very anxious moments the Satellite Symposia arranged by the South Australian and Western Australian Divisions were also very successful socially, technically and financially.

Our thanks go to Fred Zockel, Chairman who was assisted by Dave Bies, Ken Martin, Treasurer and Committee Members Michael Price, Bob Boyce, Max Bull, Dean Patterson and John Pickles who organized "Engineering for Noise Control" in Adelaide and Brian Johnson, Chairman, Val Alder, Secretary, John Spillman, Treasurer and Don Roberson who gave us "Basic Causes of Noise Deafness" in Perth.

Thanks are also due to the Victorian Division for their successful fund raising efforts which were organized by Gerald Riley assisted by Don Gibson and Len Koss. So also are those who so generously donated money and helped in many other ways including our excellent professional management service.

Finally we should congratulate Carolyn Mather, Gerald Riley and Jack Rose for their successful promotion of Australia as a suitable venue for the Congress with our Society as host.

The associations established during the congress with acousticians from other parts of the world are beginning to develop further. The Japanese Society in particular is most anxious to increase co-operation with us by the exchange of technical information. They welcome contributions to their new Journal which will be published entirely in English. They have also suggested periodical meetings of acousticians from countries on the Western Coast of the Pacific. The Council of our Society has agreed in principle with the idea and has asked for a specific proposal from the Japanese. We would like to hear whether our members are in favour of the idea, and if so where they would prefer to meet.

The future arrangements for publication of the Bulletin are being considered by the Council. We were fortunate to have a committee of the N.S.W. Division establish the journal; to be followed by a committee of the Victorian Division. These committees have worked hard to produce a valuable Publication and we thank them for their effort. The Victorian committee will cease to produce the Bulletin at the end of 1981. If anyone has any ideas on how we might organize future publications or is able to assist in any way, would he or she please contact a Council Member of your Division before the next meeting in February 1981. Please give this matter your earnest attention so that we can keep the Bulletin alive. It provides a strong link between Divisions and members and it is most important for it to continue.

Ray Piesse

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

Senior Research Fellowship in Acoustics

The main function of the Fellowship is the provision of an Acoustics Advisory Service to the building industry in New Zealand. Applicants should have a first degree in science or engineering and a higher degree which includes a substantial acoustics component. Professional experience in engineering, noise control, architectural acoustics or community noise is essential. Familiarity with real time data acquisition and control systems and their application in acoustics laboratory measurements would be advantageous. Commencing salary within the range NZ$19,846 - $22,710 per annum. Conditions of Appointment and Method of Application are available from the Assistant Registrar (Academic Appointments), University of Auckland, Private Bag, Auckland, New Zealand. Applications close on 16 January, 1981.

NEWS & NOTES

AUSTRALIAN ACOUSTICAL SOCIETY

TREASURER'S REPORT

1. DIVISIONS: All Divisions have submitted audited reports to me for their financial year ending 31st March, 1980. At that time their situation was:

	NSW	Victoria
Surplus for year	5,111.00	935.89
Cash in hand	4,207.00	1,231.26
Other assess	4,082.00	5,515.00
TOTAL ASSETS:	8,289.00	6,746.26

	S.A.	W.A.
Surplus for year	198.96	1,859.82
Cash in hand	834.76	1,892.44
Other assets	-	1,300.00
TOTAL ASSETS:	834.76	3,192.44

The very large surplus for NSW Division arises from a highly successful Conference on Occupational Hearing Loss in Sydney in 1978. The high surplus for W.A. arises from a $1,000 donation towards the ICA Satellite Symposium.

2. THE BULLETIN: I have received an audited report from the Bulletin Committee, and the Bulletin Accounts for Vol. 7 were published recently in Vol. 8, No. 2. For the year ending 31st March, 1980, the Bulletin had an operating surplus of $433.49.

3. 10TH ICA: I have received no statement from the ICA Executive Committee for the year ending 30th June, 1980. However, I am advised that the Congress is expected to make a profit.

4. COUNCIL: An audited statement of Council's income and expenditure for the year ending 30th June, 1980, was presented to the Annual General Meeting in Adelaide.

5. COMMENTS: The complete financial picture for the Society will not be known until the 10th ICA accounts are settled. The Executive Committee should seek to finalise these matters as soon as possible.

It appears that every sector of the Society has had a profitable year.

D.C. Gibson
Federal Treasurer

COMING-A QUIETER MOWER

Now that summer is upon us, the weekend hubbub created by the armada of lawn mowers at work in suburban gardens has returned to the scene. Some 300 000 of these cacophonous cutters go into service each year. But the portents are that the next generation may not be as rowdy as their predecessors.

The CSIRO Division of Mechanical Engineering has designed a quieter rotary mower that also catches grass more effectively. And Victa Limited, which sponsored part of the research project, is developing it further for the Australian market.

The key to the success of the new design is in the way the mower uses air to propel grass clippings into the catcher. This is achieved with a centrifugal fan above the cutting blades to create a whirlwind or 'vortex' of air.

The mower runs at slower engine speeds and hence with less noise than conventional models which rely on the high speed of the cutting blades to throw the cut grass into the catcher.

What may come as a surprise, though, is that the two- and four-stroke engines of today's rotary mowers are not the major source of noise. According to Dr. Don Gibson of the Division, it is the blades which create aerodynamic noise as they swish around inside their housing.

In fact modern rotary mowers are generally no quieter than those of a decade ago, despite being fitted with more efficient mufflers. This is because their peculiarly shaped blades create wind patterns in their wake as they rotate. As well as scything grass, the blades have to be shaped to hurl the grass around to the back of the mower and into the catcher. To do this they are turned up at their trailing edge to create air currents; and the housing is highly arched to channel the air-suspended grass into the catcher.

Conventional designs require a speed of 3500 rpm for the mower to cut and catch 'difficult' grass, e.g. the early morning or evening moisture-laden turf in spring. However, a speed of only 2500 rpm is necessary if the aim is solely to cut the grass.

The Division's first approach was to redesign the blades and the shell in which they are housed. However, while modifications to these components and slower operating speeds enabled aerodynamic noise from the blades as well as engine noise to be considerably reduced, the ability of the mower to catch grass was adversely affected.

Mr. Ian Shepherd, Mr. Ian Pearson and

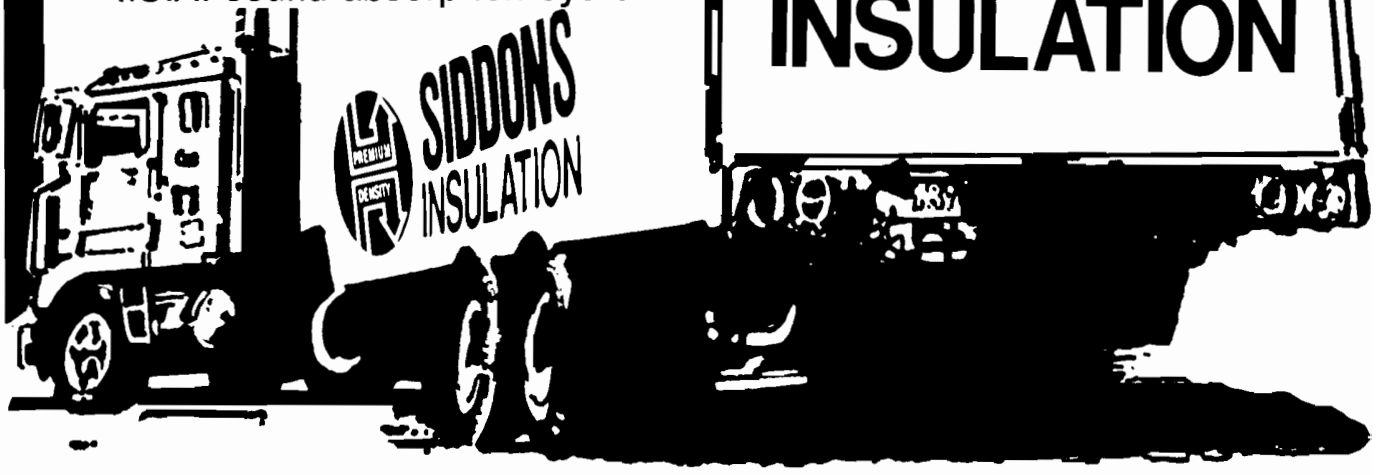
THE HI-DENSITY
INSULATION PROFESSIONALS
INDUSTRIAL AND ACOUSTIC SPECIALISTS

Greater thermal resistance
for no extra cost!
Manufacturers and suppliers of:

- Rockwool batts and blankets
- Granulated rockwool
- High temperature rockwool
- Sectional pipe insulation
- Cafco-asbestos free industrial products
- Insulkote cellulose spray-on
- Insul-fibre cellulose blow-in
- White frost fire barrier
- I.S.A. sound absorption systems.

PREMIUM DENSITY

SIDDONS INSULATION



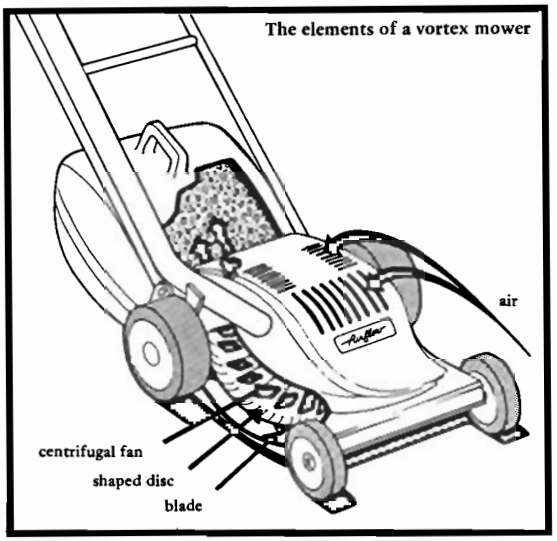
Member: Siddons Industries Limited Group

- MELBOURNE 791 4677
- BRISBANE 391 7733
- DARWIN 84 3988
- PERTH 384 1888
- ADELAIDE 262 6611
- SYDNEY 625 4444

PATON 1518

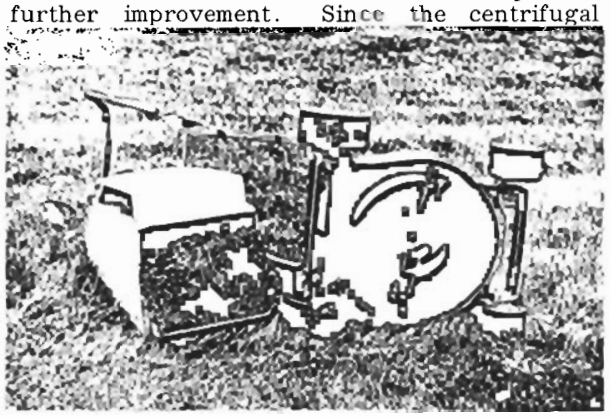
Dr. Gibson then sought alternative ways of generating the airflow needed to hurl cuttings into the catcher. They finally arrived at a design that separates the cutting function from the catching one-the one set of blades does not exercise a dual role as before. All along they worked on the principle that the mower should catch grass at the slowest speed for satisfactory mowing.

The centrifugal fan that they devised, mounted on a shaped disc above flat, inclined blades, very effectively draws air down through an opening in the top of the mower housing and swirls the air so as to pick up the cut grass and toss it into the catcher.



The researchers carried out noise tests with a prototype mower powered by a bulky but quiet electric motor. Aerodynamic noise was minimal with the dominant sound being that made by the blades as they severed the grass. The sound power of a standard commercial mower, also driven electrically, was measured in a reverberation chamber at 105 dBA for an operating speed of 3500 rpm. In comparison, the vortex prototype emitted 94 dBA at a speed of 2500 rpm. It was also better at catching grass.

Dr. Gibson thinks there is scope for further improvement. Since the centrifugal fan cools the engine while drawing in air from above, engine noise could be muffled by a sound-reducing cowling. The conventional mower engine must not be enclosed because it would run too hot-those cooling fins that surround the spark plug are not there for show!. Anyway, a cowling would only solve part of the problem with a standard mower. because, as we have learned, the blades are noisy too.



A catch of grass by the prototype vortex mower

(reprinted from CSIRO Industrial Research News.)

MOBILE ACOUSTICS LABORATORY

The Acoustics Research Unit of the Graduate School of the Built Environment of the University of New South Wales has recently acquired a Mobile Acoustics Laboratory. The Laboratory is mounted on a five (5) tonne truck and is equipped with its own 240 volt power supply. A battery operated. platform allows easy loading of equipment and an outdoor microphone system mounted on a 10 m telescopic mast enables sound fields to be sampled at various heights above the ground. Anita Lawrence, Marion Burgess and Richard Rosenberger have already put the Mobile Laboratory to good use for studies of road traffic and railway noise.

LOST

S.A. Division has lost contact with the following:-

BEARDSLEY, J.W. Subscribing Member
MANSON, J.M. Affiliate Member
SPENCER, K. Subscribing Member
INGRAM, J.C. Student Member

Anyone knowing their whereabouts is asked to put them in touch with The Registrar S.A. Division (see inside front cover).

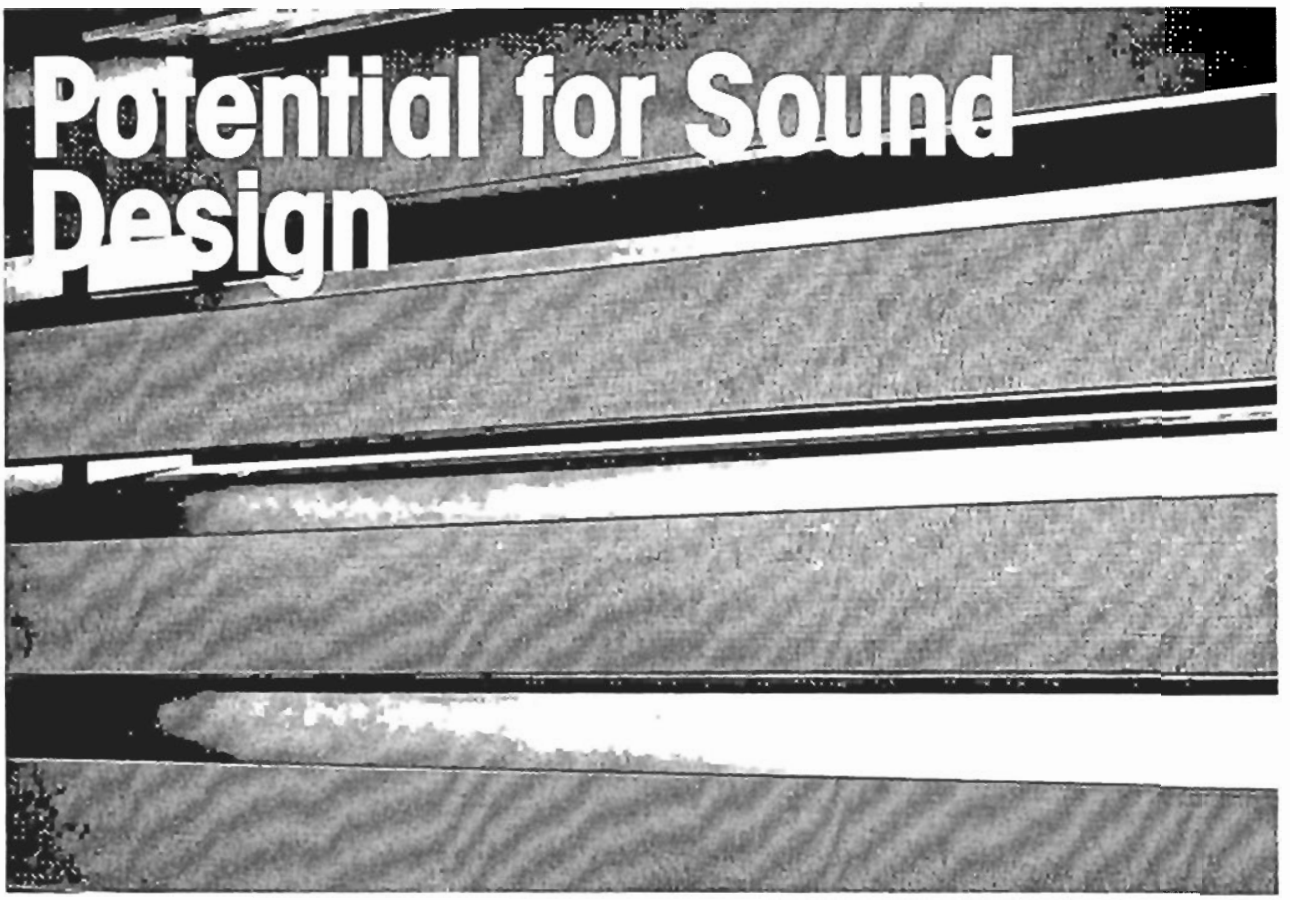
THE THEORY OF AERODYNAMIC SOUND

In the week following the 10th ICA Victoria Division, in association with CSIRO Division of Mechanical Engineering, held a specialist course on modern theories of aerodynamic sound. The course was given by Dr. Michael Howe, a senior scientist with Bolt Beranek and Newman Inc.

Sixteen participants attended from four states of the Commonwealth. Academics, research scientists and consultants were among the audience. The course was intensive and theoretical and much of its value will derive from the detailed lecture notes prepared by Dr. Howe and distributed to the participants.

Following the course, CSIRO held an informal symposium and open day on "Sound and Flow" for the participants. Several interesting problems were raised and discussed. Overall it was a great opportunity for a small band of specialists to get together and talk shop.

FLOWLINE

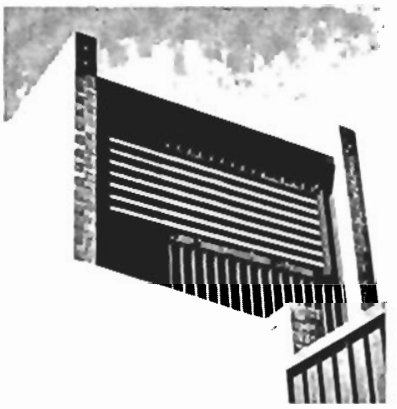


The number of imaginative applications for **FLOWLINE** Acoustic Louvres will surprise you. Their bold or fine blades can be selected to fit into any building geometry, style and colour. **FLOWLINE** Louvres give you optimum acoustic performance and low airflow resistance, at the right price.

Both styles—with different acoustic performances—provide an unequalled range for all building and industrial or commercial applications. **FLOWLINE** Louvres are well suited to your particular design concept, they are available in either galvanised sheet metal or aluminium anodised in a wide range of colours. They are backed up by independent Australian test results, with noise reductions greater than 25dB(A).

Our engineers will be only too pleased to help you solve other noise problems. We are also manufacturers of sliding or swinging acoustic doors, widely used in Art Centres, Theatres, Film Studios, Hospitals, Educational Institutions and Government Projects.

Please contact NAP. Write for our Louvre catalogue or ring and ask for a representative to come and discuss your particular requirements.



FLOWLINE

For proven performance and a better environment

NAP PTY. LTD. 17 MORESBY AV., SEAFORD STH., VIC. 3201. PHONE 786 9533.

FOR DETAILS ON OUR WIDE RANGE OF NOISE CONTROL PRODUCTS RING:

New South Wales	450 2211	Queensland	268 1933
Western Australia	446 9855	Tasmania	34 3194
South Australia	276 6041	Victoria	786 9533
Australian Capital Territory	80 5125		

we turn noise into a whisper

DIVISION REPORTS

NSW DIVISION REPORT

The Annual General Meeting of the Division was held on Wednesday 28 May and, at the subsequent Committee Meeting, the office bearers and convenors of Subcommittees were elected as follows:-

Marion BURGESS	Chairman
Ted WESTON	Vice Chairman
George PATTERSON	Secretary
John WHITLOCK	Treasurer
Bert GALE	Registrar
Peter KOTULSKI	Committee Secretary
Ken MOTT	Technical Subcommittee
Ray PIESSE	Membership Subcommittee
Anita LAWRENCE	Education Subcommittee
Michael KATEIFIDES	Directory Subcommittee

During June and July there were no Technical Meetings because of the activities associated with the 10th ICA. The Technical program recommenced in August with a talk by Jeff Wright from the S.P.C.C., on the "Administrators View of the N.S.W. Noise Control Act." This was followed in September with a talk on "Acoustic Waves in the Earth and their Use in the Exploration for Natural Resources" by Dr. David King from Sydney University. There will be a Technical Meeting in October and a Social Function in November to complete the activities for 1980. The Technical Meetings are normally held on the fourth Wednesday or Thursday of the month. There has been some concern about the static attendance at Technical Meetings even though the membership of the Division has continued to grow. As the social aspect is considered an important part of these Technical Meetings a standard format which includes provision of a buffet meal prior to the meeting has been adopted over recent months. The talk is presented in an adjacent room and people are welcome to attend this part of the evening only. A special sheet for the Notice of the Technical Meeting is being prepared and it is hoped this will have more impact on Notice Boards etc.

Michael Kateifides and John Whitlock put a lot of effort into the preparation of the Directory to ensure it was available at the time of the ICA. It is planned to produce a new Directory every two years with a supplement/ addendum on alternate years.

The Committee has been following up examples of apparent misleading advertising. For one of these cases the result has been successful as the manufacturers have agreed to modify the advertisement.

MARION BURGESS.

WESTERN AUSTRALIAN DIVISION

CHAIRMAN'S ANNUAL REPORT JUNE 10TH 1980

Office-Bearers and Committee

During my two years as Chairman of this Division, I have received tremendous support from the office-bearers and members of the committee. I would like to thank them all for their interest in the affairs of the Society.

Technical Meetings

The following meetings were held during the year:

Tuesday July 17, Dr. June Miller, Professor of the Speech and Hearing Department, University of Kansas Medical Centre, spoke on Audiology Tomorrow.

Monday September 10, Dr. Jeff Spickett, Dr. Ian Bailey and Mr. Alan Sharp from the Western Australian Institute of Technology presented Annoyance and Evaluation of Traffic Noise. This included the results of the 1978 survey carried out in the Melville area as well as some current work on the theoretical predictions of road traffic noise.

Monday December 3, Dr. Patell and his team demonstrated the ultrasonic organ imaging facilities at Royal Perth Hospital.

Wednesday March 26, Dr. Fred Heyworth, Director of Occupational Health Clean Air and Noise Abatement, Branch of the Department of Health and Medical Services presented a discussion on the Proposals for Hearing Conservation in Industry.

The venue for our Technical meetings has been the Nurses Lecture Theatre at Sir Charles Gairdner Hospital where a buffet meal is catered for. The December meeting was followed by a barbecue which proved quite popular.

Membership

Honorary Members	1
Members	28
Affiliates	1
Subscribers	6
Students	5
	41

The low-noise building.

ACI Fibreglass has long been concerned with the problems of noise control.

In fact, we have developed a number of products to help block noise on all sides. On walls, floors and ceilings.

A couple of examples:

Noise Stop Board. A high density acoustic underlay. Designed for use in floors, walls and partitions to reduce noise transmission between outside and inside areas.

Acoustic ceiling panels. A very attractive, decorative noise reduction system. Although designed to absorb noise, they also provide additional thermal insulation.

As you can see from just these two products, ACI Fibreglass has got all sides of the noise reduction problem covered. Your state ACI Fibreglass office would be most pleased to give you more information.

Simply write or call.

ACI helps make it a reality.

ACI Fibreglass

These figures do not tally with those of the Federal Register and this Commitee has endeavoured to clarify this.

Federal Council Meetings

Both Tibor Vass and I attended the meeting held in September 1979. However, neither of us were able to attend the March meeting held in Sydney. Mr. Ted Weston of the N.S.W. Division represented our interests at that meeting. One of the problems of attending these meetings is of course finance. It now seems that Federal Council will assist in this regard.

In conclusion, I would like to say how much I have enjoyed my term of office as Chairman, and I look forward to continuing my association with the Society.

Marie J. McCudden
Division Chairman

SA DIVISION REPORT

Satellite Symposium - "Engineering for Noise Control" 7 - 8 July 1980.

Set in the newly completed Banquet Room of the Adelaide Festival Centre, this highly successful symposium signalled the beginning of the 10th ICA. One hundred and thirty six registrations were received, approximately one half of these being from overseas, with fifteen different countries being represented.

The program comprised two keynote speakers and twelve contributed papers. The lively technical sessions were complimented by a well attended conference dinner on the evening of the first day at the same venue, and a relaxed and social atmosphere prevailed throughout the symposium.

Proceedings are available at a cost of $20 per copy from the SA Division Committee.

AGM of the AAS & SA Division Technical Meeting

The 10th Annual General Meeting of the Australian Acoustical Society was held at the Staff Club University of Adelaide on Friday 19 September 1980. This was followed by a Technical Meeting of the SA Division, featuring a presentation of "Some Aspects of Violin Building and Acoustics" by Mr. Rex Thomson of the Australian Catgut Society. This was highly enlightening, and climaxed with a short recital by his daughter, on a violin that he himself had made.

Following this a large proportion of the audience adjourned to the dining room, and the members of the SA Division and their guests enjoyed the opportunity of informally rubbing shoulders with interstate members of the Council.

VICTORIA DIVISION MEETINGS

The Technical Meeting held on June 11 was a joint meeting with the Environmental and Transportation Branches of the Vic. Div. of I.E.Aust. on the subject of "Motor Vehicle Noise". Speakers were Messrs. Laurie Spark and Ken Shears of GMH, and Dr. Carolyn Mather of the Victorian EPA. Laurie Spark spoke in general terms of the activities of the GMH Noise and Vibration Group, and described vibration problems in GMH cars and the various ways in which these vibrations have been reduced and isolated. Ken Shear spoke about external vehicle noise and the various problems encountered in reducing exhaust, engine, aerodynamic and tyre noise. Dr. Mather described existing statutory Motor Vehicle Noise Controls, and the Victorian EPA motor vehicle noise testing procedures. Developments in statutory noise control methods occurring interstate and overseas were also discussed. It is planned that the papers presented by these authors will be published soon.

Noise Induced Hearing Loss and Speech Therapy

The 49th Technical Meeting of the Victoria Division was held at the Lincoln Institute of Health Sciences on 17 September.

A very informative evening was enjoyed by the participants as Ms Janet Doyle, Audiologist and Ms Megan Major, Speech Pathologist, both of the Lincoln Institute discussed Noise Induced Hearing Loss and its effects on communication and speech discrimination.

Some acoustic effects were demonstrated to enable the participants to more fully understand the problems confronted by the person having a noise induced hearing loss.

Various types of communication aids available to the hard of hearing person were discussed, and informal discussion followed over supper.

Development of Quiet Tramway Vehicles

The Victoria Division arranged a most interesting visit to the Melbourne & Metropolitan Tramways Board Preston Workshop on Thursday 16 October to view the development of quiet tramway vehicles.

After refreshments, kindly provided by the M. & M.T.B., a short discussion of aspects of noise control in tramway vehicles was presented by Messrs. C. Louis Fouvy, MAAS, and Howard Smith, Works Manager of the M. & M.T.B. Preston Workshops.

A range of noise sources were discussed in the operation of a tramway vehicle, includ-

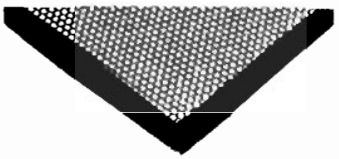
ABSORPTION

SOUNDFOAM

Urethane foam developed specifically to absorb maximum sound energy with minimum weight and thickness. Used to absorb airborne noise in industrial and EDP equipment, machinery enclosures, over-the-road and off-highway vehicles and marine and airborne equipment. Meets UL 94, HF-1 flame resistance test procedure.

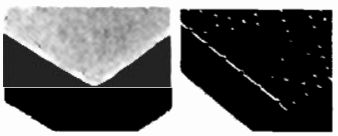
SOUNDFOAM (Embossed)

The surface pattern increases sound absorption performance 25 to 35 percent in the most critical low and mid-frequency bands when compared to other foams of the same thickness and density. Ideal solution for low frequency absorption problem. Meets UL 95, HF-1 flame resistance test procedure.



CABFOAM

An outstanding sound absorbent foam with a tough, abrasive-resistant film surface designed specifically for use where unprotected foams won't hold up, and where appearance is important, such as in over-the-road and off-highway vehicle cabs and equipment enclosures.



SOUNDFOAM (With Films)

Highly efficient Soundfoam acoustical foams are available with a surface of Tedlar, metalized Mylar, urethane film or vinyl film. Surface treatment provides attractive appearance and resistance to various chemicals and sunlight.

SOUNDFOAM
(With Perforated Vinyl)

Provides a tough, handsome finish for use in vehicles and other places where appearance is important. Leather-looking surface is bonded to highly efficient acoustic foam.

DAMPING

GP-2 DAMPING SHEET

A thin (0.050") sheet of pre-cured damping compound with pressure sensitive adhesive backing. Easily and inexpensively die cut and shaped to fit and form to flat areas and simple curves.

FOAM DAMPING SHEET

Consists of a thickness of embossed foam bonded to a sheet of highly efficient GP-2 damping material. Provides a single solution to damping and absorption problems.

DYAD

A polymer specifically developed to provide effective constrained layer damping on thick, heavy, metal plates. Applied by cementing the polymer sheet to both the structure being treated and a metal constraining layer.

EPOXY 10

A quick curing resin based damping paste which can be applied by trowel or spray. Completely resistant to severe environmental conditions, including water, acid and alkalis. Popular for marine and outdor applications.

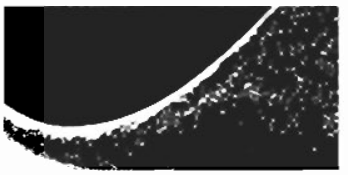
GP-1 DAMPING COMPOUND

A non-toxic, non-flammable plastic which is applied by trowel or spray. Cures quickly in air or oven. A thin coating on steel (1/2 to 1 times metal thickness) removes tinniness and ringing.

BARRIERS

SOUNDMAT LF

Soundmat LF is made up of a vibration isolation layer of foam, a lead septum sound barrier, and a layer of embossed foam to provide maximum absorption, together with noise attenuation.



SOUNDMAT FV

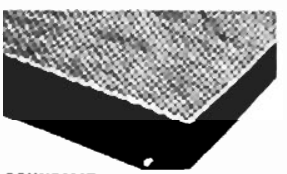
Soundmat FV has 1# limp mass barrier layer bonded to a 1/4 inch layer of acoustic foam. A heavy, scuff-resistant black vinyl skin is optional. Particularly for vehicle cab floors and bulkheads. Also used as pipe lagging.

SOUNDMAT FVP

Consists of a clossed cell, hydrolytically-stable foam isolator and a layer of open cell Soundfoam M, with a lead barrier between the two. The surface is a tough, wear-resistant 1# mass for additional transmission loss.

SOUNDMAT LGF

An acoustic absorption/barrier material with a lead septum sandwiched between two layers of inert glass fibers. Designed for "fire hazard" applications. Will not support combustion or sustain flame. Excellent resistance to organic and inorganic chemicals.



SOUNDMAT
(With perforated vinyl)

Has all the characteristics of Soundmat LF, plus a tough, handsome exterior finish for use inside vehicle cabs or other applications where good appearance must accompany noise control.

The above noise-suppression materials are available from:

NYLEX CORPORATION LIMITED

For literature and samples contact your local Nylex Sales Office:

MELBOURNE	SYDNEY	BRISBANE	ADELAIDE	PERTH	HOBART
93 0211	632 0155	371 3066	258 4000	458 8911	34 2311

ing rail crossings, vehicle wheels, trolley shoes, traction gears, brakes, air compressors and other components.

An excursion then took place around the workshops, and members were shown development of rail crossings to minimise impact noise, various type of traction gear assemblies, resilient wheel components and motor mountings as well as tram body acoustic treatment.

Geoff A. Barnes for C. Louis Fouvy,

GOSSIP

I know all you gossip column readers rush to read this gossip column each issue just so that you can see the apologies for my misdeeds and errors. Errors last issue there were and apologies I now give to those who have been wronged; but to the readers I only offer mystery as to what the errors may have been.

Last issue we mentioned the very practical way in which VIPAC approached a problem concerning train noise. This issue have some more practical work done by members of our society.

KEN COOK must get first mention for his series of three very useful and practical articles titled "Sound Insulation of Domestic Roofing Systems" published in Applied Acoustics Volume 13 numbers 2, 3, and 4.

In the same Journal, Volume 13 number 3 we have an article published by ANITA LAWRENCE and MARION BURGESS titled "Measurement of Traffic Noise Sheilding provided by Buildings".

DON GIBSON not only finds time to assist in the publication of The Bulletin but together with I.C. Shepherd has published in Noise Control Engineering May/June 1980, the article titled "Reduction of Aerodynamic Blade Noise in a Rotary Lawn Mower".

You all know that for architectural and other acoustical model studies it is necessary to have a small high frequency source such as an electric spark. This sounds very easy when you say it but how do you actually make a spark go zap when you want to; to find out read the article titled "A Spark Generator for Model Experiments" by ROBIN ALFREDSON and J. MATHEW. Robin of Monash University is currently on Sabbatical leave studying at the PURDUE UNIVERSITY, Indiana, U.S.A. Robin didn't actually tell me but I presume that he is working with MALCOLM CROCKER.

JOHN LAMBERT of the Environment Protection Authority, Victoria has achieved some fame recently through his address to the Victoria Division of AIRAH on the subject of noise from air conditioners. Following this talk John has advised me that the AUSTRALIAN ENVIRONMENT COUNCIL has published a document titled "Technical Basis for the Noise Labling of New Air Conditioners in Australia"; this document being available from the A.E.C. Secretariat, Box 449, WODEN, A.C.T., 2606.

REG McLEOD of the State Electricity Commission of Victoria, who has long been a member of the Victoria Division Committee and Honorary Registrar and Honorary Treasurer of the Victoria Division, has recently retired from these positions because I understand of pressure of work, and perhaps the desire to see more of his family. Reg's position on the Committee has been taken by JOHN LAMBERT, and the positions of Honorary Registrar and Honorary Treasurer by GEORGE CHENCO of A.P.M.

Bouquets to GREG WILD for sending me information for the Gossip Column. Greg gives news of two South Australian members. PETER GARDINER formerly of Shearer-Gardiner Pty. Ltd. has joined Tubemakers of Australia; and BEN ADAMSON formerly of White Engineering has joined Thomas Anderson and Partners.

I know all members of the Society will join me in wishing VIVIAN TAYLOR all the best for a speedy recovery. Whilst at the 10th I.C.A. Vivian stumbled and fell whilst alighting from a lift and broke two of his ribs. He is currently rehabilitating after being in Hospital after his return to Melbourne.

Did you see the large advertisement in the Australian recently for Sanyo quiet life range air conditioning units with a large photograph of LOUIS CHALLIS B.E. MSc (Arch), F.I.E. (Aust).

I noticed recently a pamphlet in the Victorian Chamber of Manufacturers monthly publication advertising a noise control workshop. With the lecturers being Richard Uncles of Audiometric Services (Vic.) Pty. Ltd., RICHARD HEGGIE of Richard Heggie Acoustics Pty. Ltd., New South Wales and JOHN SHEARER of Shearer-Gardiner Pty. Ltd., South Australia. Perhaps I missed some gossip here as I thought that RICHARD HEGGIE was associated with Soundguard in New South Wales.

RON BARDEN earns final mention in this column for his contribution titled "Towards achieving a Sound Standard" in the July issue of The Australian Standard.

In meeting among yourselves you will occasionally be surprised to hear of the doings of various members. When you do remember note it down and send it to me at Knowland Harding Fitzell Pty. Ltd. 22a Liddiard Street, Hawthorn, Victoria, 3122 or telephone me on (03) 819 4522.

Graeme E. Harding

Australian Aids for the Hard-of-Hearing Telephone User

by

D.A. Gray, E.J. Koop, and J.P.T. Goldman

Research Laboratories, Telecom Australia
770 Blackburn Road, CLAYTON, VIC., 3168

SUMMARY

It is estimated that about 200,000 Australians would experience difficulty at some time in using the telephone because of hearing impairments. This paper surveys a number of Telecom facilities available to assist the hard of hearing telephone user and describes recent developments which are intended to help people who need to use hearing aids whilst telephoning. In particular, equipment to improve the effectiveness of hearing aids intended to be magnetically coupled to the telephone is described; where possible this equipment has been designed to provide a coupling field of at least 100 mA/m over a wide range of telephone listening levels.

1. INTRODUCTION

Telecom Australia is concerned about the problems experienced by hard-of-hearing persons in communicating over the telephone. A recent (1978) Australian survey (1, 2) indicated that over 7% of our population has a hearing problem. We estimate that approximately 200,000 Australians who may need to use the telephone would experience at least occasional difficulty in telephone communication. Amongst these would be the 120,000 people over the age of 15 who use a hearing aid at least once a week (1).

This paper describes some of the aids which Telecom Australia has developed for assisting the hard-of-hearing telephone user. Many of the more recently developed aids are aimed at the hearing aid user and hence involve some form of magnetic coupling to the telephone.

An attempt is made to describe the main performance characteristics of devices for interfacing the telephone to magnetic-coupling hearing aids.

2. AIDS - STANDARD FACILITIES

Telecom Australia currently offers the hard-of-hearing telephone user the following standard facilities: Telephone with Receive Amplifier, Gliding Tone Caller, Handset Hearing Aid Coil, and Extension Bells.

2.1 Telephone with Receive Amplifier

Telephone receive amplifiers have been available in Australia for more than 30 years, but the first unit to be conveniently housed within and powered from the telephone was developed around 1959 by J.N. Bridgford (3). The current model (telephone type 8322) using silicon transistors was designed by A. O'Rourke and W. Metzenthen (4) around 1967 and introduced into service in 1974. Figure 1, which compares the receive performance at minimum and maximum gains with that of a standard telephone, shows that the amplifier increases the gain from that of a normal telephone by about 25 dB at 500 Hz and about 15 dB at 300 Hz. Although trials with amplifiers of various frequency responses by a group of hard-of-hearing users showed a slight preference for a bass-boosted amplifier (4), a more significant reason for using a bass-boosted response was the higher effective gain it permits before instability arises due to acoustic coupling via the handset transducers (the microphone has a high-frequency boost response).

2.2 Gliding Tone Caller (G.T.C.-1)

The acoustic spectrum of the 800 series telephone bell (see Figure 2) indicates that most of the bell energy lies in the frequency range above 2000 Hz. Such frequencies are largely ineffective for elderly people suffering from prebycusis (high-tone deafness), are readily absorbed by room furnishings, and are not readily transmitted into adjoining rooms.

The Australian Post Office introduced a gliding tone caller in 1974 which was based on a design by J.M. Bryant (5). This caller incorporates a swept tone signal and a small loudspeaker to produce an acoustic output within the frequency range 400 to 3000 Hz (Figure 2). Persons with a high-tone hearing loss can more readily detect the tone signal than the bell sound; furthermore the tone signal is not as greatly attenuated by room

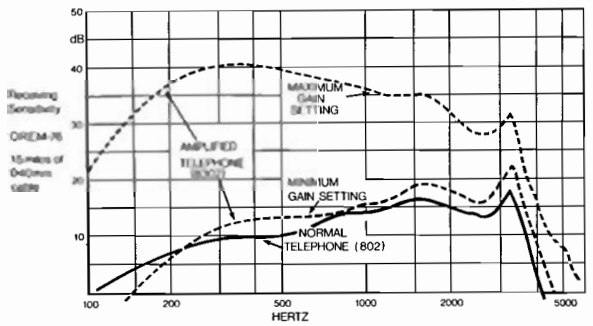


Fig. 1 Receive Performance of Amplified Telephone

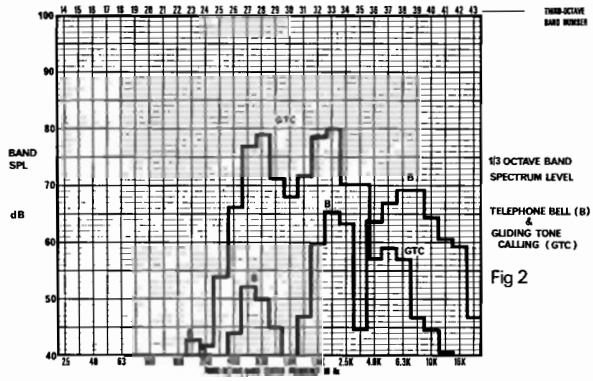


Fig 2

Fig. 2 Telephone Bell (B) and Gliding Tone Calling (GTC)

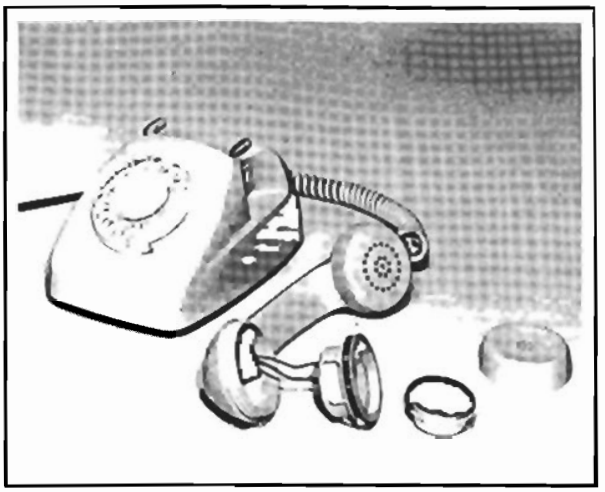


Fig. 3 Handset Type Hearing Aid Coupling Coil

structures and is not readily masked by ambient noise of the spectra typically encountered in living spaces.

2.3 Handset Hearing Aid Coil (HAC-1)

Some of the very early telephone instruments had induction coils and receivers with inefficient magnetic circuits, and it was common to find sufficient magnetic field leakage either around the body of the telephone or near the earcap of the handset to allow coupling to a hearing aid. Compared to acoustic coupling between the telephone receiver and the hearing aid microphone, magnetic coupling offers the hearing aid user a greater fidelity and relative freedom from room noise distraction.

As improved designs of telephones were introduced, these stray magnetic fields were considerably attenuated and the resultant complaints from hearing aid users initiated the development of a special coil fitted around and connected in series with the receiver of the telephone. This particular arrangement was based on a suggestion by J. Chapman (Ref. 4, Addendum 1). It was possible to provide a coil which produced at least as much magnetic field as did the early type receivers, without reducing the acoustic output of the receiver by more than 1 dB.

This coil provides a magnetic field of about 10 mA per meter on typical telephone connections and this level is consistent with the induction pick-up sensitivity of hearing aids meeting the stipulations of the I.E.C. (6). Nevertheless, telephone users find this field strength inadequate and about 10 times this value seems to be necessary. This is achieved when the coil is incorporated into the telephone with receive amplifier.

Figure 3 illustrates the form of this coil, and its assembly into the handset.

2.4 Extension Bells

The limited acoustic output power of the telephone bell, particularly at the middle and lower audio frequencies is the result of using a compact ringer with small steel gongs mounted inside of the telephone case. A suitably positioned extension bell with larger gongs can be a much more effective calling device than the telephone bell. Three gong sizes are available, viz. 2½ inch (64 mm), 4 inch (102 mm) and 6 inch (152 mm) - the two larger sizes being available for outdoor use as well as indoor.

3. EXPERIMENT AIDS

The following descriptions relate to relatively new facilities which are not yet readily available standard facilities because either:

- experimental versions are still undergoing evaluation or
- production has not reached the supply stage or
- the small demand is met by one-off specials

3.1 Receive Amplifier for T & N Type Intercom Telephone

T & N type intercom telephone systems which provide for either 2 incoming and 6 extension, or 4 incoming and 11 extension lines are commonly installed in small business premises. Following a number of requests, an especially compact amplifier board has been developed by Kahan and Casley (7) for fitting into the T & N telephone to provide receive amplification for hard-of-hearing users.

3.2 Body-Worn Hearing Aid Coil

The 1978 survey of deafness (1) revealed that just under 10% of those persons over the age of 14 who used hearing aids had body-worn aids. These people have difficulty in coupling their aid to the telephone. Some attempt to get magnetic coupling to the induction coil of the 800 series telephone by placing their aid in the recess at the rear of the telephone, and others couple acoustically or magnetically to the receiver by holding the handset upside down, with the receiver on their chest.

To meet a number of specific requests from such people a box type coil unit has been developed. The internally padded box into which the body-worn hearing aid is placed, has an external coil and is mounted on the side of the telephone, which may be an ordinary 800 series telephone or preferably a telephone with receive amplification. The coil is connected in series with the telephone receiver, although in the case of the amplified telephone it may alternatively, with some advantage be connected in parallel with the receiver. Figure 4 illustrates the form of this coil, and its attachment to the telephone.

3.3 Visual Display Indicating Handset

To supplement the range of audible calling facilities, and several existing visual display calling devices, Telecom have on field trial a visual indicating device in the form of a special handset with an in-built lamp which flashes when the telephone is rung. This handset could be useful for the hard-of-hearing telephone user, but the light output is low as it is intended to serve a supplementary signal function and is not a primary attention-getter.

3.4 Hearing Aid Coil for Public Telephones

As mentioned in 2.3 above, it has not been practicable to obtain an adequate field from the standard (passive) telephone without incurring an unacceptable loss of acoustic output from the receiver.

In the case of the public telephones, which have a readily available source of power, the use of a small amplifier to increase the available magnetic field is economically and

Fig. 4 Body-Worn Hearing Aid Coupling Coil

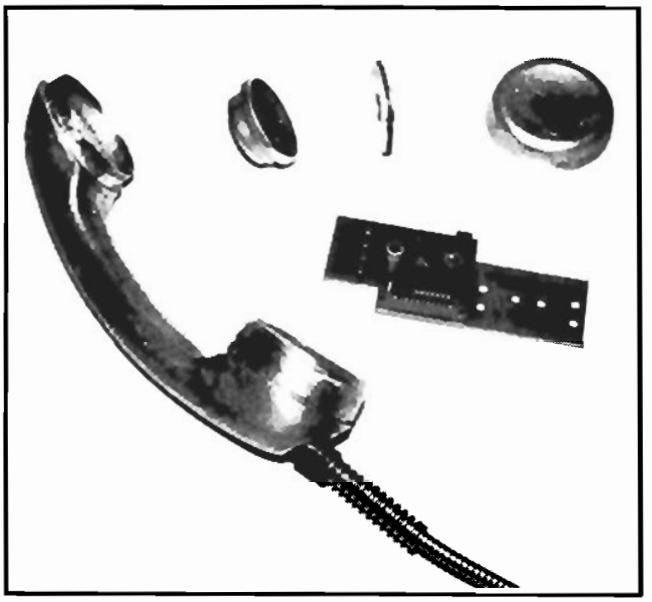


Fig. 5 Hearing Aid Coupling Coil and Amplifier for Public Telephones

technically feasible. In Australia there is currently a programme of replacing all coin public telephones with a new modern instrument suitable for subscriber-dialled trunk calls. This telephone which is intended to provide a superior performance against vandalism and coil thefts, will be fitted with a cast aluminium handset which because of its conductivity acts as an eddy-current shield for audio frequency magnetic fields.

The handsets will be fitted with a field coil between the ear-cap and the receiver, and with the aid of a small power amplifier and equaliser within the telephone, will produce an external field strength of at least 100 mA per metre near the earcap for all but the faintest of received signals, with a flat response from 300 to 3000 Hz. Within several years, almost all

public telephones should be fitted with this handset field coil.

Figure 5 illustrates this coil, handset and amplifier board.

3.5 Acousto-Magnetic Coupling

In order that the hard-of-hearing telephone user can magnetically couple his hearing aid to any telephone that he may wish to use, consideration was given to the development of a small portable device which could operate with any telephone to provide a coupling field. Acoustical coupling to the receiver was selected as the signal source for field generation.

With assistance from the National Acoustic Laboratories, principally through the availability of miniature hearing aid type components, the Telecom Research Laboratories developed several simple acousto-magnetic coupling devices using a miniature electret microphone, a standard handset coil, and a hearing aid type microcircuit amplifier operating from a single hearing aid type battery.

These prototypes demonstrated the feasibility of the approach and helped in defining the requirements of such devices, as listed below:

- Tight acoustical coupling to receivers of all handsets in comon use.
- Simple and secure attachment to handsets without marking surface finishes.
- Coupler thickness minimised to avoid excess displacement of handset from the ear.
- Compact and convenient for carrying in a pocket or handbag.
- Convenient ON/OFF switch, and gain switching if required.
- Long battery life, and simple battery replacement.
- Low cost.
- Sufficiently rugged to withstand accidental drops.

Further development of this coupler was subsequently undertaken by an Australian company who have provided further prototypes and are now planning to manufacture and market the device.

One of the main problems in the design of the amplifier for the coupler was the conflicting requirements of low current consumption and the wide dynamic range of telephone speech signals. An acceptable compromise has been achieved by using two gain settings - a normal gain for all medium to high levels of received signals, and a high gain setting (+ 14 dB) for low signal levels.

On the presumption that any response shaping to suit the hard-of-hearing person should be associated with the person's hearing aid, the coupler has been designed to produce a flat acousto-magnetic frequency response over the telephone range. Figure 6 shows that for both normal and high gain conditions the prototype coupler has a flat response from 200 to 5000 Hz. This has been achieved by using a flat pressure-response electret microphone and an amplifier to provide constant current drive to the coil.

The same figure illustrates the acousto-magnetic response of a Canadian coupler described by J.J. Wojcik (8). It exhibits a drooping response (6 dB octave) above 600 Hz which might be the result of voltage driving a highly inductive coil.

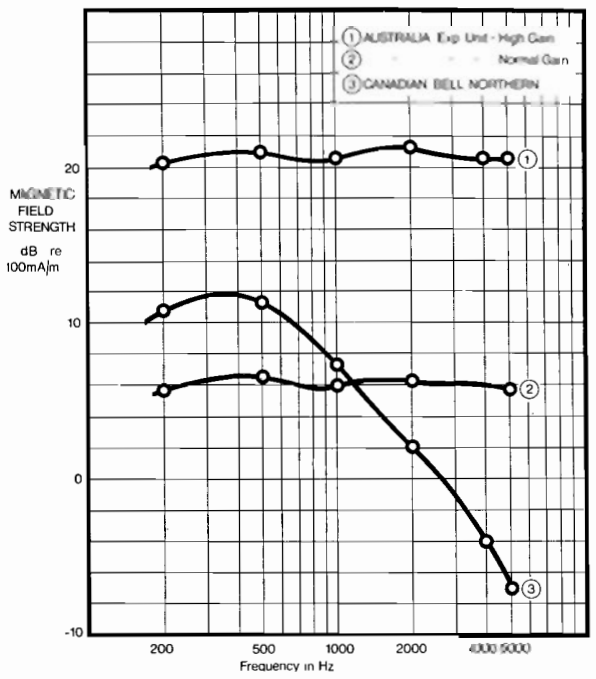
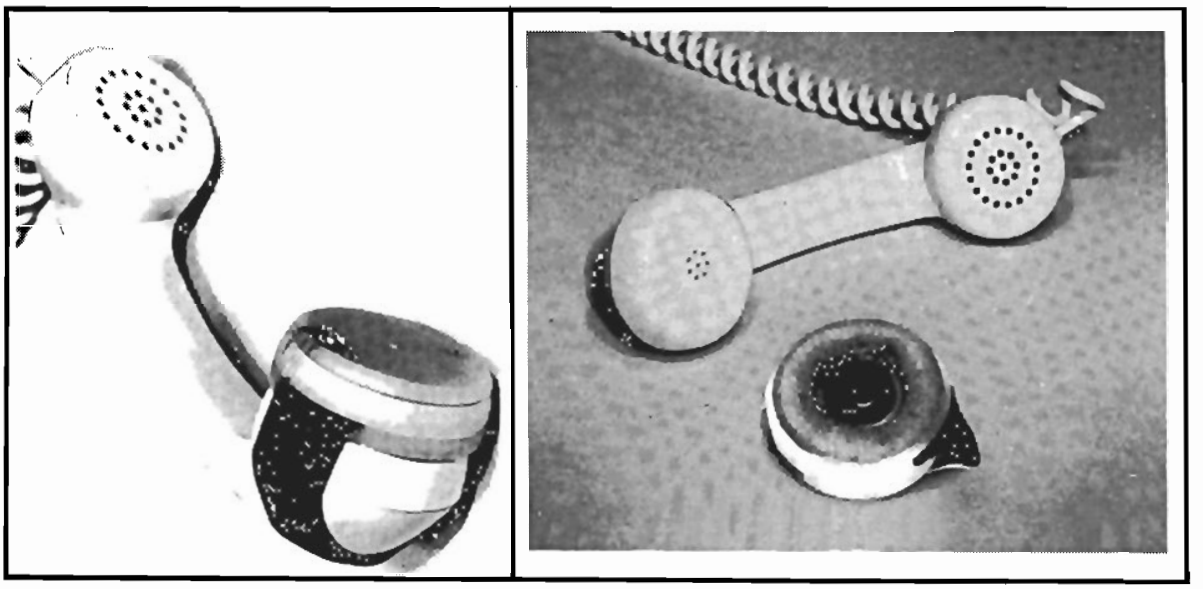


Fig. 6 Acousto-Magnetic Coupler Response (Sound Pressure Input 94 dB SPL)

Figure 7 illustrates the general form of the Australian prototype coupler and its attachment to a telephone handset.

Figure 8 illustrates the dynamic range of telephone listening levels and indicates that level range over which the prototype coupler can provide a field strength of at least 100 mA/metre on speech peaks.



a. coupler fitted to handset b. microphone side of coupler

Fig. 7 Acousto-Magnetic Coupler

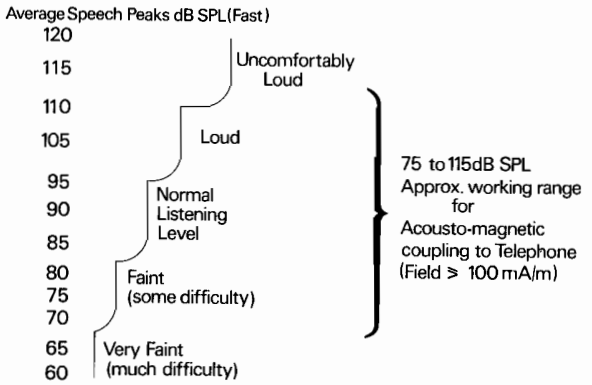


Fig. 8 Telephone Listening Level Range

4. CONCLUSION

A wide range of aids to assist the hard-of-hearing person in using the telephone is either available or under development.
Because of the advantages to hearing aid users of magnetic coupling to the telephone, much of the recent development effort has been directed to improving such facilities.

5. ACKNOWLEDGEMENT

The permission of the Director (Research), Telecom Australia, to present the above paper is hereby acknowledged.

REFERENCES

1. "Hearing and the Use of Hearing Aids (persons aged 15 years or more) September, 1978". Australian Bureau of Statistics, Canberra, Cat. No. 4336.0.

2. "Sight, Hearing and Dental Health (persons aged 2 to 14 years) February - May 1979" Australian Bureau of Statistics, Canberra, Cat. No. 4337.0.

3. J.N. Bridgford, "A Transistorized Hearing-Aid Telephone": Telecom, Jour. of Aust., Vol. 12 No. 1, June 1959.

4. A. O'Rourke and W. Metzenthen, "An 800 Series Telephone for the Hard-of-Hearing": Australian Post Office Research Lab. Report No. 6237, May 1967 (Addendum No. 1, March 1968).

5. J.M. Bryant, "An Extension Bell for the Hard-of-Hearing employing a Gliding Tone": Australian Post Office Research Lab. Report No. 5641, December 1962.

6. "Methods of Measurement of Characteristics of Hearing Aids with Induction Pick-Up Coil Input": International Electrotechnical Commission, Publication 118-1, 1975.

7. G. Kahan and G.M. Casley, "A Receive Amplifier for T & N Intercom Telephones": Telecom Australia Research Lab. Report No. 7233, 1978.

8. J.J. Wojcik, "Hearing Aids and the Telephone - A Search for better Magnetic Coupling" 9th I.C.A. Madrid, July 4-9th, 1977.

BOOK REVIEWS

TRAFFIC NOISE: A REVIEW AND BIBLIOGRAPHY ON SURFACE TRANSPORTATION NOISE 1964-1978.

by G. Vulkan and A. Gomersall, Greater London Council, England.

Published by I.F.S. (Publications) Ltd., 39 High Street, Kempston, Bedford, England. Copyright January 1979. 213 pages, 1561 abstracts, with author index 18.

This short review has a threefold purpose: to bring this important new book to the attention of AAS members, to recommend it, and to list some Australian work on traffic noise that isn't included. A more complete review is given in the March 1980 edition of the Journal of the Acoustical Society of America 67 (3), pp 1088-1089.

The Authors both work for the Greater London Council in England. George Vulkan, whose many papers on traffic noise date back to 1963, heads the GLC Scientific Branch. The book will be of great assistance to people in this country working on traffic noise. However, not all Australian work in this field is included and the list below attempts to rectify this situation.

1. Motor Vehicle Noise Legislation in Australia, Current and Impending. R.J.S. Law. Published in November 1978 for a Seminar on Noise and Vibration Control arranged by the Society of Automotive Engineers - Australasia.

2. Prediction of Noise Levels from Road Traffic. R.G. Stafford, Dept. of Public Health, South Australia. Technical Report Series No. 3, July 1975. (A revised version, co-authored by R.G. Stafford and T.J. Stubbs, was issued in April 1979 by the South Australian Dept. for the Environment.)

3. Road Traffic Noise, the Outlook for the Future. A. Lawrence and M. Burgess. Bulletin of the Australian Acoustical Society Volume 4, No. 4, Dec. 1976 pp 21-24.

4. An Approach to Traffic Noise Studies, R.E. Saunders, G.W. Jameson. Australia Road Research Board Proceedings. Volume 9, 1978. Session 30 pp 10-17.

5. Traffic Noise - Its Effect on Road Design. R.E. Saunders. Published in November 1978 for a Seminar on Noise and Vibration Control arranged by the Society of Automotive Engineers, Australasia.

6. Traffic Noise and its Effect on Site Selection and Design of Dwellings. National Capital Development Commission. Technical Paper 25. March 1978.

The following are all publications of the Australian Road Research Board.

7. Noise Levels at Seventeen Sites Near the South-East Freeway, Brisbane, A.L. Brown, 1978. Internal Report AIR 206-3.

8. The Noise - Response Relationship Near the South-East Freeway, Brisbane. A.L. Brown, 1978. Internal Report AIR 206-4.

9. Noise Levels Along Nineteen Roadways in Brisbane, Sydney and Melbourne. A.L. Brown, 1978. Internal Report 206-5.

10. Traffic Noise Annoyance Along Urban Roadways : Report on a Survey in Brisbane, Sydney and Melbourne. A.L. Brown, 1978. Internal Report 206-6.

11. South-East Freeway (Brisbane) Noise Annoyance Study: Report on the Survey. A.L. Brown, H.G. Law, 1978. Research Report No. 82.

12. Road Traffic Noise Near the S-E Freeway, Brisbane. A.L. Brown, 1978. Research Report No. 84.

13. Prediction of Freeway Noise Levels (L_{10}) : An Evaluation of the U.K. Dept. of the Environment Procedure. A.L. Brown, G.H. Hollingworth, 1978. ARRB Proceedings Volume 8, 1976. Session 33.

14. Prediction of Noise Levels from Freely - Flowing Road Traffic : an Evaluation of Current Models. A.L. Brown, 1978. Australian Road Research, Volume 8, No. 4, pp3-15.

John Modra
Environment Protection Authority,
240 Victoria Parade,
East Melbourne, Vic., 3002

* * * * * * * * * *

SEASONS GREETINGS

To our Contributors, Advertisers and Readers,

We wish you a Merry Christmas and a Prosperous New Year.

from

The Bulletin Committee

* * * * * * * * * *

CONFERENCES & COURSES

NOISE-CON 81

NOISE-CON 81, the 1981 National Conference on Noise Control Engineering, will be held at North Carolina State University in Raleigh, North Carolina, on June 8 - 10, 1981 at the McKimmon Continuing Education Center.

The conference will be sponsored by the Institute of Noise Control Engineering and the School of Engineering, North Carolina State University; Dr. Frank Hart is the General Chairman, Dr. Larry Royster is the Program Chairman, and Mr. Butch Stewart is the Publicity Chairman.

The theme of NOISE-CON 81 is APPLIED NOISE CONTROL TECHNOLOGY. Ten sessions are presently planned and each session will consist of invited and contributed papers. The ten sessions planned are as follows:

1. Textiles and Fibers
2. Furniture and Sawmill
3. Noise Source Identification
4. Barriers and Enclosures
5. Tobacco and Packaging
6. Mufflers
7. Metal Working
8. Hearing Protection Devices
9. Community Noise
10. Miscellaneous Topics

Contributed papers will be selected by a review of the submitted abstracts (a maximum of 1000 words, one figure, and up to five equations may be included). The deadline for receipt of the abstracts is January 14, 1981.

A special seminar on fundamentals and applications of noise control technology, the NOISE-CON SEMINAR, will be held prior to NOISE-CON 81 on June 4 - 6, 1981.

Those wishing to submit abstracts of contributed papers or desiring further information on the conference or seminar should contact:

Dr. Larry Royster,
NOISE-CON 81 Program Chairman,
Center for Acoustical Studies,
Dept. of Mechanical & Aerospace Engr.,
North Carolina State University,
Raleigh, N.C. 27650
(919) 737-3366

INTER-NOISE 81 6-8 October 1981, Amsterdam

The 10th International Conference on Noise Control Engineering will be organized by the Netherlands Acoustical Society NAG in cooperation with the Belgian Acoustical Association ABAV under sponsorship of International/INCE. It is to be held at the RAI-Congress Building in Amsterdam from Tuesday 6 through Thursday 8 October 1981.

The theme of the conference is PRACTICE OF NOISE CONTROL ENGINEERING. The technical program will highlight research and development in noise control engineering, state of the art summaries and tutorial/clinical workshops.

The program includes:

- Machinery Noise Reduction at the Source
- Reduction of In-Plant Noise Exposure
- Noise Control Engineering in Buildings
- Noise control on Household Appliances
- Traffic Noise
- Aircraft and Airport Noise
- Rail Transportation Noise
- Shipboard Noise Control
- Noise Measurement, Analysis and Instrumentation
- Designing and Planning for Industrial and Traffic Noise Control
- Government Programs and Legislation for Noise Control
- International Standards for Noise
- An Exhibition of Materials and Equipment for Noise Control

PAPERS

Contributed papers that should be addressed to the topics mentioned above, are welcome. An abstract of about 500 words must be submitted before 1 February 1981.

EXHIBITION

An exhibition of noise control equipment and materials will be featured at the Conference Building. Parties interested in sponsoring an exhibit should contact the Conference Secretariat.

FURTHER INFORMATION apply to:

INTER-NOISE 81
P.O. Box 85542
2508 CE The Hague
The Netherlands

REVIEW OF COURSES IN ACOUSTICS

(A) POST GRADUATE COURSES

1. UNIVERSITY OF NEW SOUTH WALES:

(i) Graduate School of the Built Environment
Master of Science (Acoustics)

This course provides for graduate study and research in several important areas of acoustics, such as community noise control, noise control in industry and in buildings,

'the big clang bang'

or 'the controlled hush'

Bestobell can provide a complete service from survey to installation including acoustic curtains and modules; acoustic connectors; treatment of pipes and ducts; attenuating materials (Coustibell) for enclosing feed pumps, power units, compressors, rumblers, bottling and canning plants, conveyors and other noisy machinery; attenuating/absorptive materials (Coustilam) for sound studios, computer rooms, boats, barriers, curtains, in manufacturing plants, process and assembly lines; damping/absorptive/attenuation materials (Dempison) for sound insulation, vibration damping on sheet metal structures, such as motor cars, tractors, buses, railway carriages, lifts and household machines. Bestobell can also supply a range of acoustic foam materials, fibreglass, rockwool and lead sheet materials. See Bestobell Engineering Products acoustic materials catalogue.

You know what it's like. You enter some work area and the place is a bedlam of noise. You have to shout to be heard. But you can enter other work places and the noise level is subdued, yet they are doing similar work. Why? Because some people know the value of noise control.

If your work area suffers from 'the big clang bang' syndrome, call in the noise control specialists—Bestobell Engineering Products. We know a lot about acoustic materials to control noise, to produce 'the controlled hush' that makes for more efficient work, more profitable work for you.

Phone today and ask for our acoustic materials catalogue.

Adelaide 47 2622, Brisbane 44 1711, Bundaberg 71 2923, Cairns 51 2698, Canberra 80 6591, Devonport 24 4711, Geelong 78 5222, Gippsland 34 5880, Gladstone 72 3532, Hobart 72 4744, Launceston 31 6360, Mackay 57 3038, Melbourne 211 7222, Newcastle 61 1121, Perth 337 4411, Port Hedland 73 2475, Sydney 736 2266, Townsville 71 6036, Whyalla 45 9396, Wollongong 28 4600.

Bestobell
Engineering Products

BA 194-979-AM

auditorium design and physical acoustics. It is designed primarily for graduates in engineering, architecture, science or building who wish to specialize in acoustics and it is suitable for those who wish to find employment with noise control authorities, or in industry, to practice as consultants, to undertake research or to become part of a multidisciplinary team in an architectural or engineering practice.

The course is normally taken over four part-time sessions.

Further details:

The Head,
Graduate School of Built Environment,
University of New South Wales,
P.O. Box 1,
KENSINGTON, N.S.W. 2033.

Post graduate research degrees in Acoustics can also be undertaken through the Graduate School of the Built Environment.

(ii) Other Schools, such as Physics and Engineering offer Master's Courses which allow for some specialisation in Acoustics. Details should be otained from the Head of the relevant Schools. These Schools also offer research degrees in aspects of Acoustics.

2. MONASH UNIVERSITY:

There are course options available in the fields of acoustics, vibration and mechanism as a part requirement for the award of a Master of Engineering Science Degree. This course is intended for part-time students.

Further information from:

The Dean,
Faculty of Engineering,
Monash University,
CLAYTON, VIC., 3168

3. GRIFFITH UNIVERSITY:

The Griffith University has supervision and facilities available for research programmes in environmental noise leading to the degree of Master of Philosophy or Doctor of Philosophy.

An honours programme in environmental noise is available to graduates of Griffith University and to graduates of other recognised teaching institutions. In certain circumstances the honours course may be able to be undertaken as a two-year part-time programme.

Further information from:

School of Australian Environmental Studies
Griffith University,
NATHAN, BRISBANE, QLD., 4111

4. MACQUARIE UNIVERSITY:

The Macquarie University has recently introduced a course in audiology leading to the award of Master of Arts. The programme, extending over three years part-time is intended to train graduates who will be competent to diagnose auditory problems, provide assessment of hearing aids, provide parent and client counselling, investigate programmes and aural rehabilitation and initiate research in these fields.

Further information from:

Registrar,
Macquarie University,
NORTH RYDE, N.S.W. 2113

5. UNIVERSITY OF MELBOURNE:

The University of Melbourne offers a post-graduate diploma in the field of audiology. The course consists of a series of lectures, demonstrations, seminars and tutorials on audiology. Subjects studied include acoustics, anatomy, biophysics, linguistics, physiology, psychology, audiometry, auditory training, communication disorders, general audiology, geriatric audiology, hearing aids, industrial audiology, otolaryngology, paediatric audiology and parent guidance.

Further information from:

The Secretary,
Department of Otolaryngology,
University of Melbourne,
PARKVILLE, VIC., 3052

(B) UNDERGRADUATE COURSES

1. UNIVERSITY OF NSW:

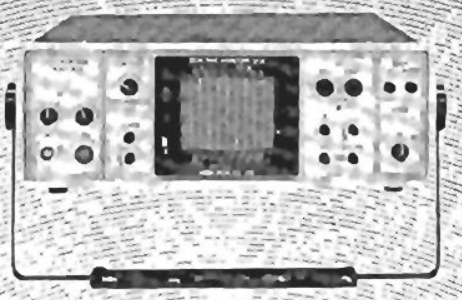
There are no undergraduate courses in Acoustics. However many courses include subjects which cover specific aspects of Acoustics. These can be undertaken as Miscellaneous Subjects following approval by the Head of School. The Handbooks for the Schools of Physics, Engineering and Architecture should be consulted for details.

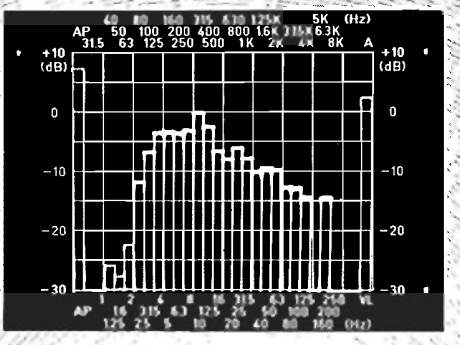
Details of Miscellaneous fees can be obtained from the University.

2. SYDNEY UNIVERSITY:

The Departments of Architectural Science, Mechanical Engineering, Music and Psychology conduct separate courses in various aspects of Acoustics and Vibration, however there is no formal undergraduate course in these topics. Enquiries regarding admission and content of these courses may be directed to the various Heads of Departments.

Details of fees for Miscellaneous Subjects can be obtained from the University.





Ideal for On-site or Laboratory Work

The RION's small size, light weight (8.5kg), and internal rechargeable battery, make the RION SA-24 a go-anywhere analysis tool. Its 240V capability makes it ideal for all benchwork.

Versatile

Three quick-change plug-in filter options are available:
i) 1/3 octave Low Frequency 1-250Hz (25 bands)
ii) 1/3 octave High Frequency 31.5-8kHz (25 bands)
iii) 1/1 octave High Frequency 31.5-8kHz (9 bands)

Illuminated Screen Graticule (Fig. 1)

Makes photographic records and night viewing possible.

Detailed Observation of Display

This can be achieved with instantaneous hold facility or "Automatic Hold" as determined by pre-set level control.

Extended Portable Operation

This is possible by means of the optional external battery pack or car battery and gives up to approximately 8 hours' operation.

REAL-TIME ANALYSER

MODEL SA-24

NEW RELEASES!

RION®

LEVEL RECORDER

MODEL LR-04

Portable—Light Weight

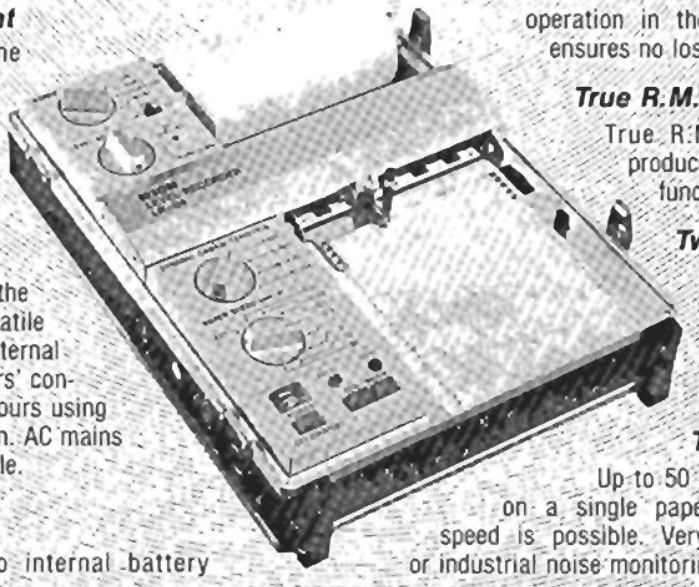
Weighing only 4.5kg, the LR-04 makes an ideal companion instrument to the SA-24 Real Time Analyser for all on-site or bench analysis.

Mains or Battery Operation

Three power options make the LR-04 one of the most versatile level recorders available. Internal batteries give up to 10 hours' continuous operation and 20 hours using external battery pack option. AC mains may be used where available.

No Loss of Records Due to Mains Failure

Automatic changeover to internal battery operation in the event of mains failure ensures no loss of record continuity.



True R.M.S.

True R.M.S. recordings can be produced in addition to AC linear function.

Two Pen Speeds

Constant or exponential to IEC-179. Ideal for impulsive input levels.

Continuous Long Term Measurement

Up to 50 days' continuous recording on a single paper roll using the slowest speed is possible. Very useful in environmental or industrial noise monitoring situations.

For further information on the extensive Rion range contact:

WF **WARBURTON FRANKI**

● ADELAIDE (08) 356-7333 ● BRISBANE (07) 52-7255 ● HOBART (002) 28-0321
● MELBOURNE (03) 699-4999 ● PERTH (09) 277-7000 ● SYDNEY (02) 648-1711
● AUCKLAND N.Z. (09) 77-0924 ● WELLINGTON N.Z. (04) 69-8272

3. NSW INSTITUTE OF TECHNOLOGY:

The Departments of Mechanical Engineering and Architecture and Building conduct courses which have acoustical, vibration or hearing conservation type content.

Enquiries should be directed to the Head of the Department, P.O. Box 123, Broadway, N.S.W., 2007.

4. GRIFFITH UNIVERSITY

An undergraduate course "Air Pollution and Noise" is available to full-time students in the third year of the B.Sc. course at Griffith University. Part-time study for this degree will commence in 1980.

An undergraduate honours course in "Environmental Noise" is also available as part of the honours programme. This may also be coupled with a project concerning environmental noise.

Further information can be obtained from the School of Australian Environmental Studies, Griffith University, Nathan, Brisbane, Queensland, 4111.

5. CAPRICORNIA INSTITUTE OF ADVANCED EDUCATION

An undergraduate subject "Acoustics and Vibrations" is available in the third year of the B.App.Sc (Physics) degree course, and a less mathematical subject on acoustics is available in the Assoc. Dip. in Applied Physics course. These subjects are offered for full-time and external students. External students must attend the laboratory sessions conducted at the C.I.A.E.

Further information:

The Head,
Department of Applied Physics,
Capricornia Institute of Advanced Education,
ROCKHAMPTON, QLD., 4700

6. Courses in acoustics and vibration are available either permanently, as part of an undergraduate degree, or from time to time on a course option basis. Institutions offering these courses include:

(i) University of Wollongong:

Further information from:

The University of Wollongong,
P.O. Box 1144,
WOLLONGONG, N.S.W. 2500

(ii) Queensland Institute of Technology:

Further information from:

The Queensland Institute of Tech.,
P.O. Box 246,
NORTH QUAY, QLD., 4000

(iii) Monash University

Further information from:

Faculty of Engineering,
Monash University,
CLAYTON, VIC., 3168

(iv) University of Adelaide:

Further information from:

The University of Adelaide,
Box 498, G.P.O.,
ADELAIDE, S.A., 5001

(v) Swinburne College of Technology

Further information from:

Swinburne College of Technology,
John Street,
HAWTHORN, VIC., 3122

(vi) University of Queensland

Further information from:

University of Queensland,
St. Lucia,
QUEENSLAND, 4067

(vii) Royal Melbourne Institute of Technology

Further information from:

Royal Melbourne Institute of Tech.,
124 La Trobe St.,
MELBOURNE, VIC.

(viii) University of Western Australia:

Further information from:

University of Western Australia,
Mounts Bay Road,
CRAWLEY, W.A., 6009

(ix) Western Australian Institute of Technology:

Further information from:

Western Australian Institute of Tech.,
Hayman Road,
BENTLEY, W.A., 6102

THE NUMBERS GAME UPSTAGED

by

METROSONICS OF ROCHESTER N.Y.

- LEQ'S

  MINUTE BY MINUTE

  or even second by second

  and as cumulative dose

  from the

  db 301/306 METROLOGGERS

  (db 301/652 as HARD COPY SYSTEM)

- LN'S

  From SECOND BY SECOND to every

  xth hour from the

  NEW db 603 ENVIRONMENTAL

  NOISE ANALYSER (with db 603 printer)

0 ALL AVAILABLE EX AUSTRALIAN STOCK **0**

REPRESENTED IN AUSTRALIA BY

AUSTRALIAN GENERAL ELECTRIC (SALES) LIMITED

PRIVATE MAIL BAG 96, BROADWAY, NSW, 2007

PHONE:

Charles Salmon SYDNEY
Paul Hanford (02) 212 3711

John Vestergaard PERTH
(09) 328 7677

(C) TECHNICAL COURSES

Some courses in acoustics and vibration are available either permanently, as part of a technical course in a discipline related to engineering, architecture or building, or from time to time as a course option or for general education purposes. Institutions offering these courses include:

1. N.S.W. Department of Further Education:

The Department conducts a three year part-time course in audiometry at the Sydney Technical College. The course is designed to train an Audiometrist to use calibrated audiometric test equipment and to perform basic audiometric tests. An Audiometrist is also concerned with the fitting of hearing aids and the making of impressions for earmoulds.

Further information from:

The Head,
School of Biological Sciences,
Sydney Technical College,
BROADWAY, N.S.W., 2007

2. Preston Institute of Technology:

Further information from:

Preston Institute of Technology,
Plenty Road,
BUNDOORA, VIC., 3083

3. Paxton-Barrand Hearing Aids Pty. Ltd., conducts a short course on audiometry for screening purposes. Direct all enquiries to Mr. K. Barrand, 283 George Street, Sydney, N.S.W., 2000.

(D) RADIO AND TV CORRESPONDENCE COURSES

1. UNIVERSITY OF N.S.W.: DIVISION OF POST GRADUATE EXTENSION STUDIES:

This Division offers a vareity of non-examinable courses over Radio University and Radio Television. Many of these courses are also available on audio and video cassettes which can be purchased or in the case of video cassettes hired. Some courses currently available are:

"Noise Control in Buildings" for Architects and Builders, 8 Audio and 2 Video.

"Acoustical Systems" basic Acoustics, 6 Audio and 1 Video.

"Audio Equipment in Communcation" sound equipment, 9 Audio and 1 Video.

"Industrial Noise Control" for Engineers and Architects, 10 Audio and 2 Video.

For further details about the Courses contact:

Division of Post Graduate Studies,
University of N.S.W.,
P.O. Box 1,
KENSINGTON, N.S.W., 2033

(E) SYMPOSIA, CONFERENCES ETC.

1. AUSTRALIAN ACOUSTICAL SOCIETY CONFERENCE:

This conference, held annually, usually comprises invited papers on a particular theme. Recent themes have been "Occupational Hearing Loss", Sydney 1978 and "Building Design Criteria", Melbourne 1979. The proceedings of these Conferences are available for puchase from the Society, c/- Science Centre, 35 Clarence St., Sydney, 2000.

2. UNIVERSITY OF N.S.W. GRADUATE SCHOOL OF THE BUILT ENVIRONMENT:

Post-Professional Courses are held as part of the continuing Education Programme, and some of these are on particular aspects of Acoustics. Two recent courses have been "Road Traffic Noise - Measurement, Assessment, Prediction and Control" and "The N.S.W. Ordinance to Noise Control Regulations". For details about the proceedings of the Courses or about future courses please contact The Secretary, Graduate School of the Built Environment, University of N.S.W., P.O. Box 1, Kensington, 2033.

STANDARDS & REGULATIONS

STANDARDS REPORT

In this Report an attempt has been made to review briefly the activities of the various Acoustics Standards Technical Committees in the recent past. There are ten Acoustics Standards Technical Committees, the work of which is co-ordinated by the Acoustics Standards Committee, which in turn is assisted by an Executive Subcommittee. Dr. R.G. Barden, Consulting Engineer, Melbourne is the Chairman of the Acoustics Standards Committee and the Executive Subcommittee.

The activities of the individual technical committees are as follows:

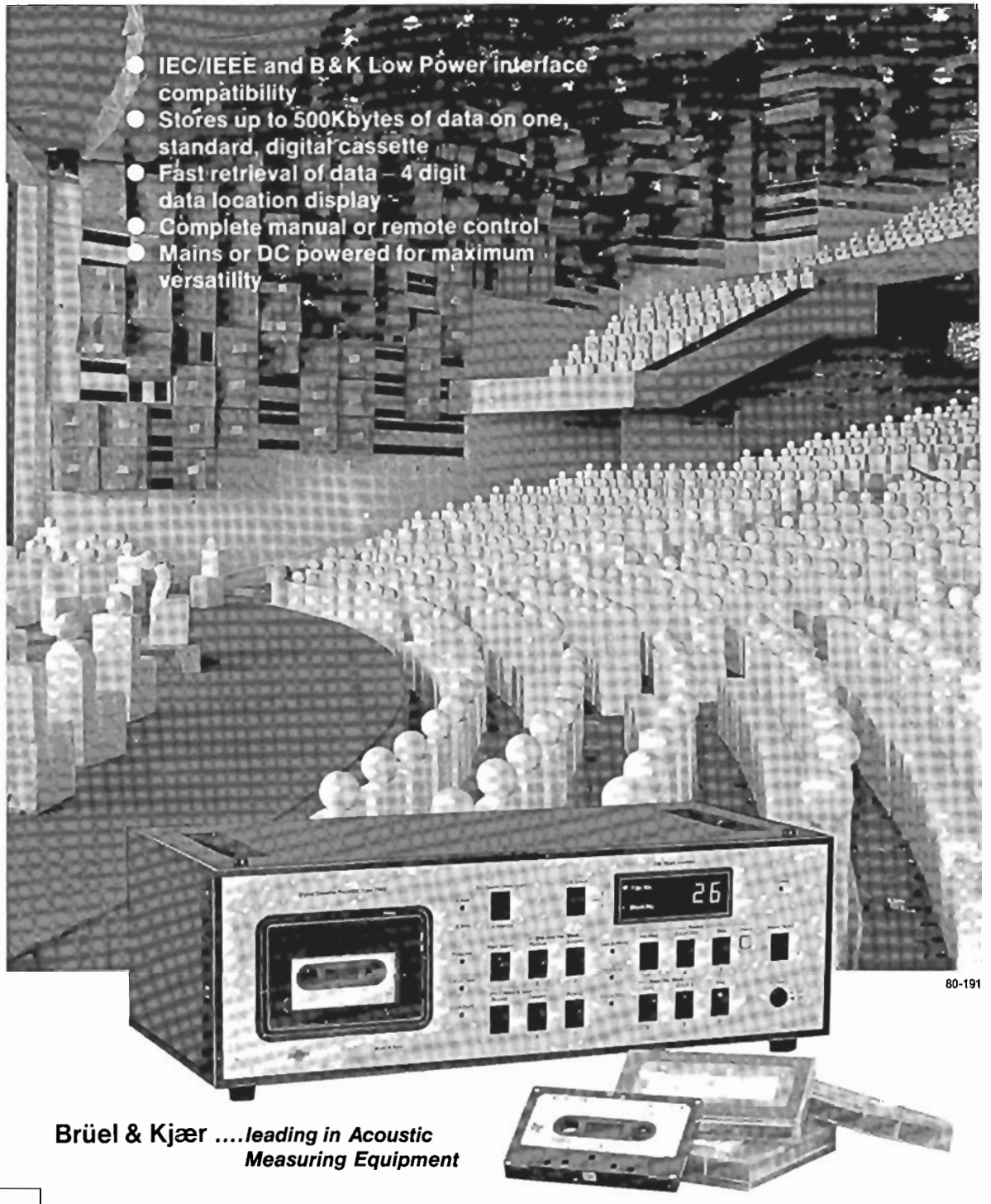
1. Committee : AK/1 - Terms, Units and Symbols.

Chairman: Mr. A.K. Connor, Melbourne

Activities: The main activity of this committee is the preparation of a draft

Store those results as they happen.
Reproduce them at the touch of a button

The Digital Cassette Recorder 7400



Brüel & Kjær ....*leading in Acoustic Measuring Equipment*

Brüel & Kjaer Australia PTY. LTD.

HEAD OFFICE:
33 Majors Bay Road,
Concord, N.S.W., 2137
P.O. Box 120, Concord, N.S.W., 2137
Telephone: 736 1755 Telex: 26246

MELBOURNE OFFICE:
8/12 Pascoe Vale Road,
Moonee Ponds, Vic., 3039
P.O. Box 233, Moonee Ponds, Vic., 3039
Telephone: 370 7666 Telex: 33728

PERTH OFFICE:
P.O. Box 64,
Mundaring, 6073
Telephone: 295 1658

ADELAIDE OFFICE:
P.O. Box 420,
Norwood, 5067
Telephone: 278 3351

revision of AS 1633, Glossary of Acoustic Terms, which will be issued for public comment during 1980.

2. Committee : AK/2 Instrumentation and Techniques of Measurement.

Chairman: Mr. R.A. Piesse, National Acoustic Laboratories, Sydney.

Deputy Chairman: Mr. P. Dubout, CSIRO Division of Building Research, Melbourne.

The Committee was responsible for the publication of MP44, Guide for the Use of Sound Measuring Equipment, Part 1 - Portable Sound Level Meters. This publication provides useful guidance on the correct use of portable sound level meters, which is being used extensively in Australia. The need for proper use of portable sound level meters, on which this publication provides authoritative guidance, to provide reliable results of sound level measurements needs no emphasis.

A specification for portable noise dosemeters (earlier issued for public comment as DR 77096) has been finalized by this Committee and is being processed for publication.

The other prospects engaging the attention of this Committee are:

(a) Preparation of a guide for the use of equipment for analysis of sound signals (to be MP44, Part 2).

(b) Performance requirements of tape recorders for the recording and replaying of acoustic signals in acoustical measurement systems.

(c) Methods of measurement of airborne sound emitted by machines (revision of AS 1217 to be prepared taking note of the development of ISO standards in this area).

(d) Sound level meters (revision of AS 1259). According to recent IEC draft documentation, it is proposed to have four degrees of precision designated by Type O, Type 1, Type 2 and Type 3. The specification for all the types are the same and differ only in tolerance allowed. Tolerances broaden as type number increases. Type O is intended as a laboratory reference standard, Type 1 for laboratory use, Type 2 for general field application and Type 3 for field noise survey purposes.

Pure tone audiometer for advanced audiological use and background noise levels for audiometer rooms.

3. Committee : AK/3 - Hearing Conservation

Chairman: Dr. A.G. Cumpston (Canberra)

The main activities of this committee are:

(a) Amendments to AS 1269 involving revision of Appendix D of AS 1269 to include the effect of duration of exposure and certain other amendments to the text in AS 1269.

(b) Commentary to AS 1269 will be finalised taking note of the proposed amendments.

4. Committee : AK/4 - Architectural Acoustics

Chairman: Dr. C.E. Mather (E.P.A., Victoria).

This committee was responsible for the publication of the following two standards:

AS 2253, Methods for field measurement of the reduction of airborne sound transmission in buildings.

AS 1276, Methods for the determination of sound transmission class and noise isolation class.

The other projects being handled by this committee include the following:

(a) Method for the measurement of reverberation time in auditoriums

This document, which was issued for public comment as DR 78156 is expected to be published during 1980.

(b) Methods of test for air duct sound attenuators.

(c) Laboratory measurement of airborne sound attenuation of ceilings using the two room method.

(d) Method of measurement of the reduction of airborne sound by the facades of buildings.

(e) Estimation of aircraft noise exposure on land use planning.

(f) Method of measurement of plumbing and drainage noise.

(g) Revision/amendment to AS 2021 1977, Building siting and construction against aircraft noise intrusion, to take note of the recent changes in aircraft types both on domestic and international flights.

(h) Method for measurement of room absorption using a reference sound source.

5. Committee : AK/5 Community Noise

Chairman: Prof. A.B. Lawrence (University of NSW, Sydney).

Deputy Chairman: Mr. W. Davern (CSIRO Division of Building Research, Melbourne).

Introducing the last thing you'd expect from GenRad. Average results.

Finding the average sound level of a machine that operates in cycles isn't easy. Unless you're using GenRad's new 1988 Precision Integrating Sound-Level Meter and Analyzer.

With the integrating feature, you can measure equivalent continuous level (Leq) automatically and precisely. Which means it gives you average results when you need them.

The 1988 indicates both instantaneous and integrated levels using A, B, C, or flat weighting, or ten octave frequency bands.

It can be preset for any time period from one second to 24 hours, and left unattended. An optional battery pack permits 24 hour operation. And elapsed time can be read any time.

What's more, another mode measures sound exposure level (SEL).

GenRad's new meter conforms to ANSI and IEC standards for Type 1 instruments. It's extremely lightweight, and can be used with a printer or recorder to provide hard copy records.

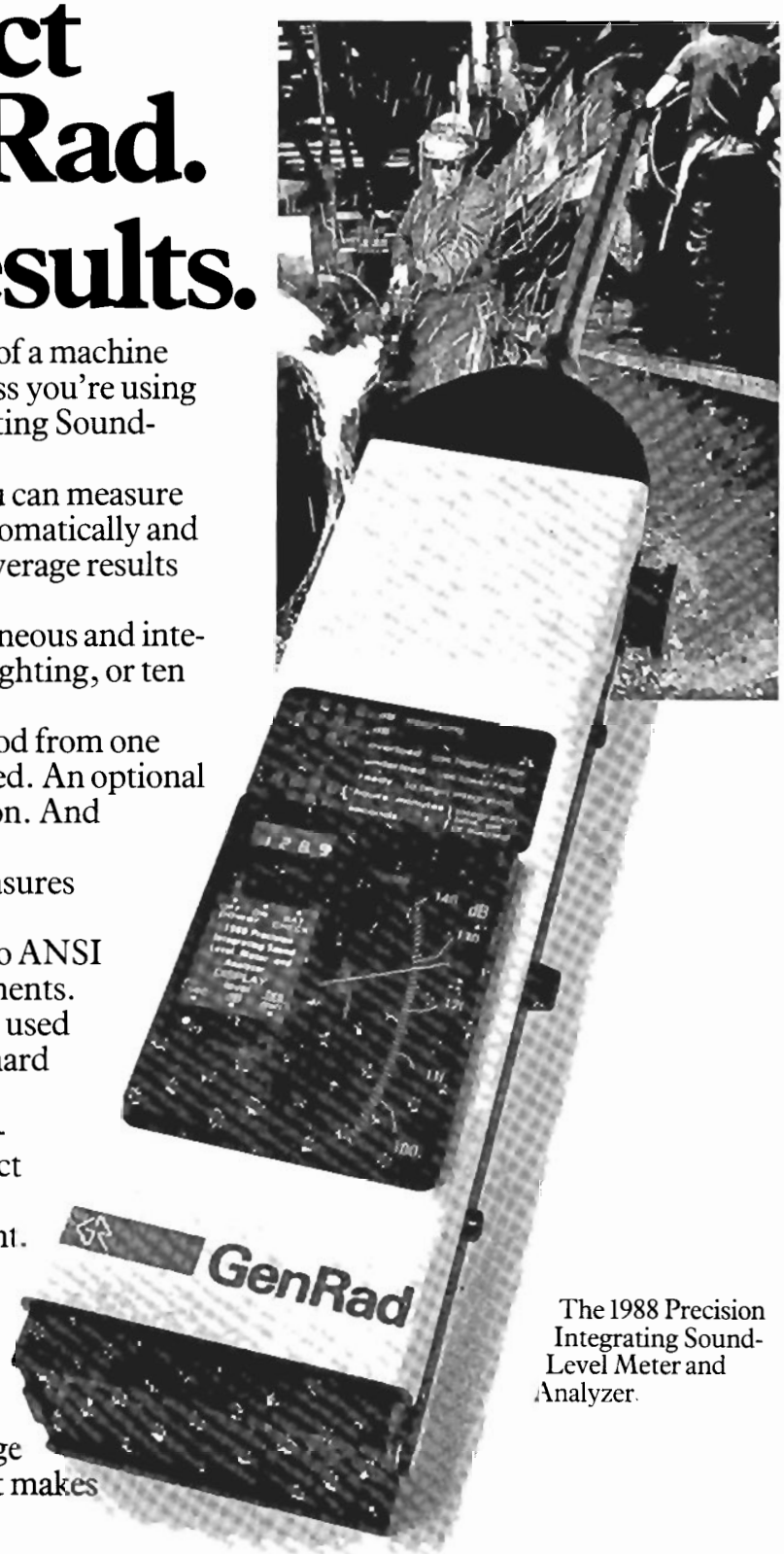
Add the low price to these exceptional features and you have the perfect sound level meter for product, industrial or community noise measurement.

Find out more.

A member of our new Acoustic Support Group will answer and give you all the advice you need.

Then order the new 1988.

Because the promise of an average reading is only one of the features that makes this meter so special.



The 1988 Precision Integrating Sound-Level Meter and Analyzer.

ELMEASCO
Instruments Pty. Ltd.

SYDNEY:
P.O. Box 30
Concord, N.S.W. 2137
Telephone: 736-2888

MELBOURNE:
P.O. Box 107
Mt. Waverley, VIC. 3149
Telephone: 233 4044

GenRad
Put our leadership to the test.

This committee was responsible for the recent publication of the new standard AS 2240, Methods of measurement of sound emitted by road vehicles.

This committee is engaged in the following projects:

(a) Procedure for measuring and predicting the sound emitted by road traffic.

(b) Revision of AS 1055, Noise assessment in residential areas.

This work takes note of recent developments in the noise assessment procedure in residential areas both in Australia and overseas and particularly the procedures being developed during the revision of the International Standard 1996, which is in an advanced stage toward publication.

6. Committee : AK/6 - Aircraft noise.

Chairman: Dr. R. Willis (Consultant Surgeon, Melbourne).

Deputy Chairman: Mr. J.A. Rose (National Acoustic Laboratories, Sydney).

This committee is keeping a working brief of International Standards work in this area.

7. Committee : AK/7 - Noise in ships

Chairman: Capt. D. Wharington (Department of Transport, Melbourne).

This committee was responsible for the recent publication of AS 2254, recommended noise ratings for various areas of occupancy in vessels.

This committee is working on the preparation of a document giving recommended noise levels emitted by, vessels on waterways in ports and harbours, taking note of the work in this area both within Australia and overseas and particularly the work of UNESCO Intergovernmental Technical Committee in this area.

8. Committee : AK/8 - Noise from agricultural tractors and earthmoving machinery.

Chairman: Mr. W. Brown (Department of Agriculture, Victoria, Melbourne).

This committee is working on a method of measurement of airborne sound from powered mowers, and edge cutters pertaining to both bystander and operator positions, taking note of the requirements of the State Environmental and Health Authorities and International Standards work in progress in this area.

9. Committee : AK/9 - Noise from pneumatic tools and machines.

This committee recently issued a public review document DR 79158, Draft standard for noise control on construction and demolition sites, for which there has been good response. This document will be processed during 1980 towards publication.

The other projects of this committee are:

(a) Method of measurement of sound pressure levels for stationary compressors.

(b) Measurement of sound power level of compressors and pneumatic tools and machines.

(c) Noise rating/classification of pneumatic tools and machines.

10. Committee : AK/10 - Noise from railbound vehicles.

Chairman: Dr. R.G. Barden (Consulting Engineer, Melbourne).

This main activity of this committee is preparation of a method for the measurement of airborne sound from railbound vehicles, which was issued for public comment as DR 79003. This standard is likely to be finalised and published during 1980.

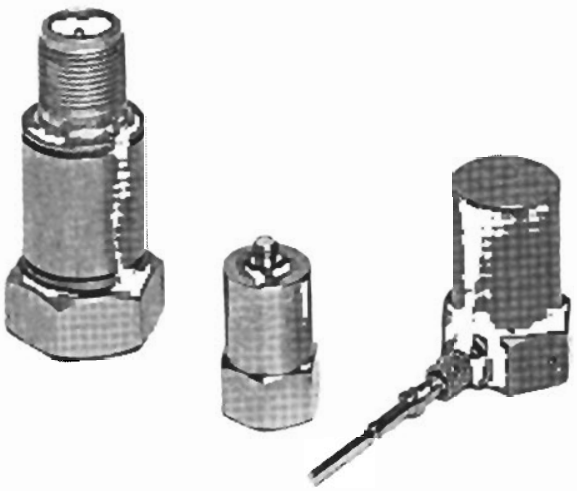
Liaison Activities with the Australian Acoustical Society, Victoria Division.

The Standards Association of Australia is pleased to note that Victoria Division of the Australian Acoustical Society conducted a number of workshops in Melbourne to consider certain public comment draft documents which included the draft method of reverberation time in auditoriums and draft standard for noise control in construction and demolition sites. The Association welcomes deliberations on these workshops and the various Acoustical Standards Technical Committees take careful note of the recommendations emanating from these workshops on various Australian Standards, which are published and which are due for publication having been issued as draft for comment. The Association as a matter of policy welcomes from the members of the Australian Acoustical Society suggestions for the preparation of new Australian standards or the review of existing standards and such communications may be addressed to the Engineer-Secretary, Acoustics Standards Committee, Standards Association of Australia, P.O. Box 458, North Sydney, NSW, 2060 or to any of the Association's branch offices in State capital cities or Newcastle.

NEW PRODUCTS

RUGGED ACCELEROMETER

A new high temperature accelerometer range has been introduced by B.B.N. Instruments Corporation. The 400 series will work up to 400°C at pressures up to 1000 psi in hostile environments. They are ruggedly constructed for use in industrial machinery, nuclear environments and aircraft engines. Vipac Instruments Pty. Ltd. are the local agents.



INTEGRATING SOUND LEVEL METERS

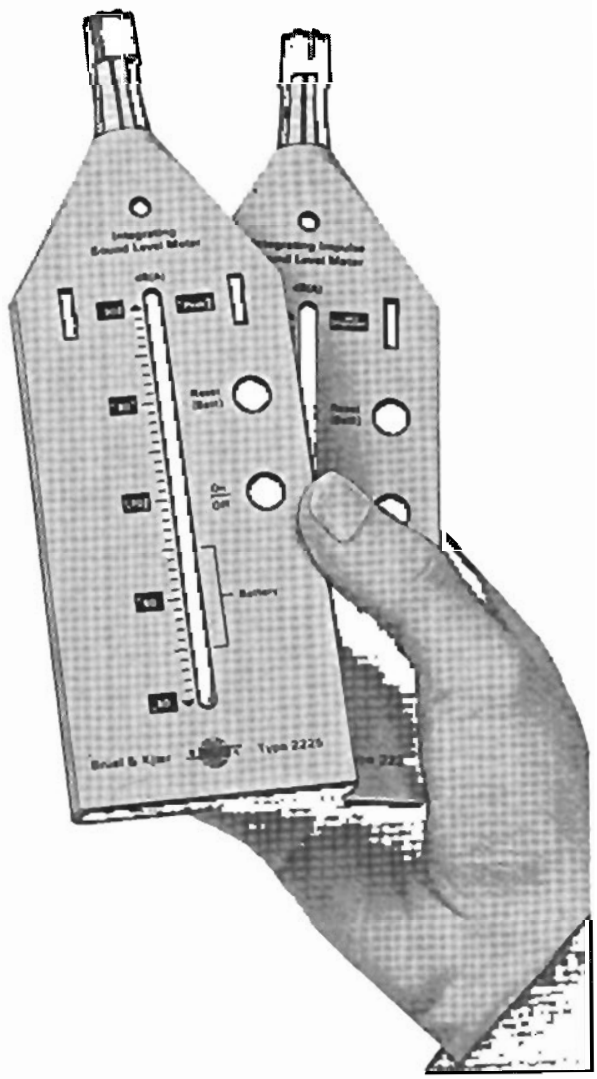
Two new Integrating Sound Level Meters for noise and sound level measurements to type 2 standards have been developed by Bruel and Kjaer.

Designated Type 2225 and Type 2226, they offer a range of facilities previously only available on larger, more expensive instruments. Both types are slim enough (only 22mm) and light enough (350gm) to be easily carried in the pocket, ready for immediate use, and the simple one-handed control layout enables anyone to measure noise competently after only a short familiarisation period.

Both instruments measure A-weighted levels using either "Slow" or "Fast" time constants, and L_{eq} for a fixed period of 60 seconds from which SEL can be easily calculated. A short term L_{eq} eliminates the uncertainties of visually averaging a fluctuating display. In addition, Type 2225 has a "Peak hold" facility (with a rise time of 30 µs) while the Type 2226 has an "Impulse" detector to international standards and RMS "Max Hold" can be selected on all modes of measurements.

Fitted with a Prepolarized Condenser Microphone Type 4175 as standard, the instruments have a dynamic range from 25 dB (A) to 140 dB (A) peak with high crest factor capability. Readout is via a linear "thermometer" display of Light Emitting Diodes, the entire dynamic range of the instrument being covered in only 4 attenuator steps of 40 DB. Readout is accurate to half a dB, and the brightness of the LEDs is controlled automatically to be readable in any light conditions, even direct sunlight.

Typical applications are expected to be in factory noise surveys, traffic noise measurement, assessment of community noise problems, aircraft noise measurements, and the preliminary assessment of hearing damage risk.



NEW HIGH RESOLUTION SIGNAL ANALYZER

Innovative use of large memories makes the High Resolution Signal Analyzer type 2033 developed by Bruel & Kjaer a significant step forward in the field of real-time FFT analysis.

The input memory of the analyzer has been enlarged to hold 10240 samples of the time signal, i.e. ten times more than usually found in an FFT analyzer. This introduces three principal benefits, namely, a non-destructive zoom function, scan analysis, and alias-free tracking.

When the 2033 is set to analyze in its baseband mode, it operates similarly to a conventional 400-line FFT analyzer. In its high resolution mode, a ten times zoom is introduced. In contrast to conventional zoom transforms, however, the time function is preserved to allow multiple zooms on the same data and, for instance, the measurement of the 4000-line spectrum of a 10240 sample time record. This preservation of the time function can make the 2033 up to 400 times faster than an FFT analyzer processing conventional zoom transforms, where a new time record must be recorded for each new transform.

The scan function is ideally suited to the analysis of transient and non-stationary signals. Here, 10240 samples of the time signal are recorded in the 2033 input memory, and a 1024 sample long flat or Hanning window is stepped along them, with the 1024 samples extracted with each step being analyzed and displayed. The effect is to see a "live" display of the changing spectral content of the 10240 sample time function on the 2033 display screen. The rate of scan, i.e., the speed with which the window steps through the 10240 samples, is selectable from 8 values, and a scan can take from about 1 second to about 2 minutes. Simultaneously, a "scan average" is generated, this being a linear average of the spectra generated during the scan.

Alias-free tracking is a further benefit introduced by the 2033 zoom process. Here, the 2033 is able to track moving processes over speed ranges of up to 15:1, without the introduction of aliasing distortion. This avoids the need for costly tracking antialiasing filters in the analysis set-up.

NOISE DOSE METER

A new, compact noise dose meter, small enough to be worn without hampering work, for measuring the total accumulated noise exposure of working personnel has been developed by Bruel & Kjaer.

Supplied with a condenser microphone which fastens directly to the meter or with a preamplifier for attachment close to the wearer's ear, the 4428 combines accurate noise exposure measurements (to ISO B1999) with pocket size convenience. It responds to peaks as short as 100 us and has "long" and "short" term measurement modes providing continuous readout of the percentage allowable exposure. Hazardous noise peaks exceeding 135 dB(A) activate a warning which is displayed on the meter front. The instrument is powered internally by standard 9V transistor radio batteries. A rechargeable NiCd battery plus a suitable charger are available as accessories.

Supplied with the meter are conversion tables for determining the "Equivalent Continuous Sound Level" (L_{eq}) and a protective leather case.

PREPOLARIZED CONDENSER MICROPHONES

Two new additions to its family of measurement-quality microphones for accurate and reliable sound measurements are announced by Bruel and Kjaer.

The prepolarized Condenser Microphone Type 4155 is acoustically equivalent to Type 4165 from the existing range, and is intended for noise and sound level measurements according to IEC 651 Type 1. Being supplied with a comprehensive individual calibration chart, Type 4175 is acoustically equivalent to Type 4125 and is intended for measurements according to IEC 651 Type 2.

Both are half inch free-field types with high sensitivity (50 mV/Pa) and wide frequency range (4 Hz and 20 kHz for Type 4155, and 5 Hz to 12,5 kHz for Type 4175). Polarization is achieved via a charge-carrying element on the backplate and therefore no external polarizing source is required. This allows simplification of the associated electronics and reduces power consumption, important factors in the design of small, hand-held instruments. In all other respects the design and construction are identical to other B & K Condenser Microphones, and therefore the long term stability is just as good over a wide temperature range.

WIDE RANGE MEASURING AMPLIFIER

A new wide range amplifier-voltmeter for use as a calibrated amplifier and in comprehensive measurement of sound, vibration and voltage signals has been developed by Bruel & Kjaer.

As a low noise, wide range amplifier the 2610 incorporates LED displays giving gain/measuring range and overload indications. Accurate true RMS and Peak level detectors plus a Max. Hold facility also enable the 2610 to be used as a precision voltmeter. A high pass filter and 'A' weighting system are incorporated for sound measurement and facilities are provided for the connection of external filters for frequency analysis. Accurate vibration measurements can be made using B. & K. piezoelectric accelerometers and other vibration transducers. The output can be supplied in either AC (Lin) or DC (Log) form for use with tape and graphic recorders.

INFORMATION FOR CONTRIBUTORS

Items for publication in the Bulletin are of two types

(a) Shorter articles - which will appear typically under the heading 'News and Notes'

(b) Longer articles - which will appear as refereed technical articles.

The closing dates for the receipt of these articles are as follows:

Vol. 9 No. 1 Longer articles: Mid January; Shorter articles: Mid February.
Vol. 9 No. 2 Longer articles: Mid May; Shorter articles: Mid June.

Articles may be sent directly to the editor or via the local State Bulletin representative.

There are no particular constraints on "shorter articles" except that they should be of relevance to the Society and be received on time.

Attention to the following matters will assist when processing "longer articles".

(i) Length - typically from 3 to 4 pages when printed.

(ii) Title and Authors Address - the title should be concise and honestly indicate the content of the paper. The author's name and that of his organisation together with an adequate address should also appear for the benefit of members who may wish to discuss the work privately with the author.

(iii) Summary - The summary should be self contained and be as explicit as possible. It should indicate the principal conclusions reached. That should be possible in less than 200 words. Many more members will read the summary than will read the paper. Everybody seems to be busy these days.

(iv) Main Body of the Article - This should contain an introduction, and be followed by a series of logical events which lead finally to the conclusions or recommendations. The use of headings greatly assists the reader in following the logic of the paper. The conclusions should of course be based on the work presented and not on other material.

(v) References - Any standardised system is acceptable - for example those used by Journal of Sound and Vibration, Journal of the Acoustical Society of America, or The Institution of Engineers, Australia. Page numbers and dates are important, particularly when referencing books.

(vi) Tables and Diagrams - As a general rule, Tables are best avoided. Diagrams may need to be redrawn during the editorial stage. They ought to be totally self explanatory, complete with a title, and with axes clearly labelled and units unambiguously shown.

The papers generally will be subject to review but this is not intended to discourage members. The author no doubt would prefer to have any anomaly drawn to his attention privately rather than to gain notoriety by having errors published widely.