

NEWS

FROM THE WORLD OF SOUND

Sound 77 at Wembley

This year's Association of Public Address Engineers Sound and Communications Exhibition shows promise of being an outstanding gathering as the venue is now the Wembley Conference Centre and will include an additional exhibition of Audio-Visual equipment. The dates are 19-21 April.

Participating firms include: AKG, Calrec, Electrovoice, Gramplan, Hayden, Rola Celestion, Shure and many others from the professional audio field.

Tickets are available from P.A. Dealers, or APAELtd., 47 Windsor Road, Slough, Berks.

Digital Audio

Donald Reid, of the BBC Research Dept, gave the AES lecture on January 18th, surveying all aspects of the problems and techniques associated with coding, transmission and re-creation of high quality audio signals via quantising systems. Such processing offers indefinite signal relay without degradation of quality, together with high noise immunity, at the expense of having to use a large bandwidth to obviate the audible effects arising from sampling rate and discontinuities.

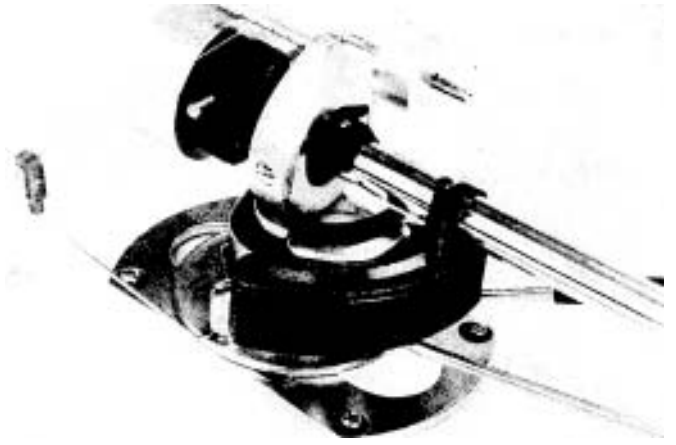
The subject is more complicated than might at first be assumed, and the lecturer commenced with some audio demonstrations. These, of male speech, were sampled at rates of 4, 8, 16 and 32 kHz, giving results ranging from unrecognisable, through very distorted to acceptable, and very clean, respectively. Non-linear sampling processes must add some quantising noise and the theoretical p-p signal/p-p noise ratio obtainable is 2^n , where n is the number of binary samples (also called digits or bits) and it was shown that the maximum r.m.s. signal to r.m.s. noise ratio was $6.02n + 1.8$ dB. Further demonstrations showed that the character of the residual noise was a function of the actual signal level. Piano reproduction using only 6 digits was distorted, with complete fade-out at low levels, 7 only slightly better, 8 better but with near fade out, 9 similar with only a hint of fade out, while 10 and 11 gave acceptably low distortion. It was emphasised that

coding accuracy was vital and could be affected by component tolerances in the encoding and/or decoding equipment, which are further aggravated by the thermal environment, etc. Superior results were obtainable using a ramp counter system, in which each sample is generated in 31-25 microseconds, whilst a dual slope conversion, using one slope for the 7 most significant bits and another at 1/64 rate for the 6 least significant was even better. The BBC use 13 bits plus 1 error bit at a rate of 3.66 Mbits/sec.

It was demonstrated that normal sampling gave a low but variable noise level, using piano, but the addition of a 'dither' signal to the input gave an almost constant noise. Alternative techniques could be used, including 'near instantaneous' quantising, in which the sampling level is modified according to the signal level itself, using a compander circuit. This offers some 9 dB improvement in the ultimate S/N ratio and comparisons on programme showed that digitally companded 7 bits/sample could equal the performance of linearly coded 13 bits/sample. Further demonstrations showed the improvements using a parity bit to reduce errors at error rates of 1 in 10^5 , 10^4 and 10^3 —the protected transmission was clean in all cases, but interference without varied from noticeable to intolerable with complete loss of intelligibility in some cases. A further demonstration showed that wow in recording could be very effectively nullified by digital correction techniques.

Further developments were thought to include the all digital studio, requiring fast microprocessors, and direct digital broadcasting, an extension of the PCM (pulse code modulation) links already used for programme distribution throughout the country. There was also a possibility that high rate sampling could be used to transmit the changes in the audio signal.

Questions during the discussion period centred around the application of digital coding to sound mixing consoles, master tapes and sound in syncs in the TV waveform. Internationally, it has been agreed that a 32 kHz sampling rate be adopted and it is likely that 2.048 Mbits/sec. links will come into use.



SME Dampener

An add-on dampener will soon be available to owners of SME arms. It consists of a paddle-in-dashpot mechanism situated near the pivot and can be simply disconnected if

not required. The main use would seem to be to enable cartridges with low internal damping at low frequencies to be used without distress.

Harwood Loudspeaker

Dudley Harwood was for many years a member and leader of the BBC's research team in acoustics. His published work has an authority few can approach in this field, and has laid the technical foundation which underpins many of today's successful British loudspeaker designs. He has now left the BBC and is starting to manufacture a loudspeaker design with several interesting features.

Despite his position as 'father of Bextrene', the design features a cone of an entirely different plastic, which does not require application of damping compounds, and thus preserves light weight and efficiency. This enables the speaker to produce a

sound pressure level of 107 dBA (1 m) which is a significant improvement over comparable designs. Power handling is 100 watts programme and frequency response 50 Hz-25 kHz ± 3 dB.

The tweeter is the 1 in. Son-Audax soft dome unit which is being used by Celef and the Spendor SA1 with some success. There is also an unusual application of mechanical damping to the birch ply cabinet. Other aspects of the design are accepted 'BBC' style: 24x13x12 ins. vented enclosure; iron-cored inductors and polyester capacitors in the crossover; $\pm 1/2$ dB unit sensitivity matching with auto transformer; and foam acoustic damping.

Mr. Harwood claims that the new drive unit gives lower coloration as well as higher sensitivity than Bextrene, and suggests that this is the 'new generation' material, as far advanced on Bextrene as the latter was on paper. When one takes into account the commercial success and influence of the BBC LS 3/6 and LS 3/5A designs, plus the importance of other ex-BBC designs at Spendor and Chartwell, to name but two, it is plain that Mr. Harwood's decision to go into manufacturing is of great interest and significance.

Price is expected to be about £240 plus VAT per pair, and the factory address is 2a Nova Road, West Croydon CR0 2TL.

